CS-101 Final-Term BY Attiq Kundi

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(Updated at 30-01-2023)

Attacks that can be made to prevent access to web sites

DOS

Which of the following data type will be used for a variable having whole numeric values.

Integer

What is the output of the following code?

```
int sum =25;
if ( sum >= 20 )
cout<<"You win ";
 if ( sum < 20 ) cout<<"You lose ";
cout<<"the prize.";
```

You win the prize.

What will be the output of =COUNTIF(A2:A6,">=71") formula on the given Excel table:

	A
1	Test Score
2	65
3	71
4	89
5	21
6	71
7	34
8	81

2

\Each pass through a loop is called a(n) .

Iteration

TUG robot can carry medications of _____ kg.

450

The field of NLP tends towards which direction

AI

by Attiq Kundi

Which of the following is a BLOCK element of HTML?

<Table>

is a hand-coding environment for writing and editing HTML and JavaScript in Adobe Dreamweaver.

Code view

XML stands for?

Extensible Markup Language

Compilers and Editors come under which type of software?

System software

In which stage of SDLC, interaction of the system with outside world is defined.

Requirements analysis

Previously, computers were based on dedicated CPUs, those CPUs performed.

Only one task

Which of the following is not the primary area of concern in design phase?

Architecture

Which of the following testing technique focuses on the functional requirements of the software?

Black box testing

Which of the following symbol is used for grouping in a pseudo code.

( )

Hearing loss due to computer is more common in those listening to:

High volume

Consider the XML statement <staff clef = "treble"></staff> and tell what is the value of attribute in the statement?

Treble

Specific legal rights which protect the owners of IP are:

IPR

Privacy uses the theory of

Natural right

Generally the technique is used to transmit passwords securely over the internet.

Encryption

by Atiq Kundi

DVD stands for.

Digital Versatile Disk

MS word is part of:

Microsoft office

Buttons to increase and decrease size of text are available on:

Front Group

Font effects include:

Italicize

What will be the output of =MIN(A6:A8) formula on the given excel table:

	A
1	**Test Score**
2	65
3	71
4	89
5	21
6	71
7	34
8	81

34

Shortcut key to insert a new comment in MS word is:

Shift + F2

We can store samples per second for long distance telephone communication.

8000

Address of cell containing value "8" in spread sheet given below is:

	A	B
1	1	2
2	4	5
3	7	8

B3

Address of cell containing value "5" in spreadsheet given below is:

	A	B
1	1	2
2	4	5
3	7	8

B2

An interrupt converts the CPU to privileged mode and transfers control to within the operating system.

by Atiq Kundi

Interrupt handler

Page group options include:

Page break

Title page of the document is called:

Cover page

When we share the document with others and want them to understand it easily we can add:

Comments

A one-dimensional array with elements could be used to store the number of times each alphabet letter occurs in a page of text.

26

Inserting a new entry at the top of a stack is called ___ an entry.

Pushing

We often refer to the number of nodes in the longest path from the root to a leaf as the of the tree.

Depth

The nodes at the other extreme are called_nodes.

Terminal

Attacks that can be made to prevent access to web sites

DOS

Software licenses provide end users with the right to one or more copies of the software without

violating copyrights

Learning procedural knowledge usually involves a process:

Trial-and-error

Which of the following is a robot used in medical field

Belgian robot

Shortcut to select the whole text in a document

by Atiq Kundi

ctrl+A

Editing group have commands

3

Matching geometric characteristics technique cannot read:

Hand written material

Content filtering is used to implement company policies related to

Information system

The location that is used to temporary store the information that has been cut from some where

Clipboard

A_____ is a file that is accessed in a serial manner from its beginningto its end as though the information in the file were arranged in one long row.

Sequential fill

Arrange Group is in which ribbon of MS Word?

Page Layout

Justify option is used to give spaces to the paragraph on left and rightside

equal

Shortcut to insert a new comment in MS word is:

Shift+F2

The people present around the e-waste gain

Diseases

The field of Artificial intelligence is being pursued along paths

2

by Atiq Kundi

People are working in sitting position and thus have more chance to

Obesity

Privacy is the "right to be let alone" is written by

Samuel D.Warren

The shortcut key that **Track Changes** is

Ctrl+Shift+E

Information that was once buried in arcane records has become

Database

In the United States is the Privacy Act of 1974 whose purpose was to protect citizens from abusive use of databases

Government

Want to reapply a command you can use:

Redo

Displaying text in two columns feature is in which tab of MS word

Page layout

here are many types of sensors:

All of these

(microphones,

cameras,

rangesensors)

by Atiq Kundi

Electronic Theft include

Online scam

How many common forms of data mining?

2

(class description and class discrimination)

Text files, which are _ in which each logical record is a single symbol encoded using ASCII or Unicode

Sequential files

Actions according to environment knowledge

Intelligent action

Ribbon has types of Commands

Three

Plagiarism is a major problem in

Education

Data comes from:

All of the above

OSI stands for

Open System Interconnection

Internet is a type of

Network

Which of the following acts as a security guard between the Internet and your local area network:

Firewall

by Atiq Kundi

Ctrl+y is used for

Redo

Ctrl+z is used

Undo

Process of understanding what the characteristics of images is step

Two

Researchers are trying to develop systems that exhibits intelligent behavior in track

Engineering

The option of justify is in group

Paragraph

The option of bullets is in group

Paragraph

The option of strike through is in group

Font

Hyperlinks have by default color:

Blue Clipboard

Process of understanding what the characteristics of images means refer to

Image analysis

Undo is used by

Ctrl+z

In Belgian Pepper Robot works in

Hospitals

by Atiq Kundi

The part where different bullets options are given is called

Bullet library

Software licenses are

All of these

(proprietary,

free,

opensource)

Proofing Group is in which ribbon of MS word?

Review

Word provides you preformatted text boxes through

Textbox

The amount of paper American use in a year is

85 million tons

One method that got on social media is the idea of a parent/child cell phones

Contract

Pages is an option in the ribbon

Insert

When we draw a table in MS word the table have Initial column(s)

One

A patent can last

20years

by Atiq Kundi

Content filtering works by matching of characters

Strings

Procedural knowledge is learning

How

Declarative knowledge is learning

What

We can add charts in MS word from

Illustrations

Illustration is part of ribbon

Insert

Shortcut to insert end note

Ctrl+Shift+D

Shortcut to insert footnote

Alt+Ctrl+F

major component of syntactic analysis

parsing

The test that matches will have a chance to pass to Turing was of

5minutes

Each statement in a natural language can have

by Atiq Kundi

Multiple meanings

Shortcut key of paste is

Ctrl+v

Meaning of a statement in natural language depends on its

Context

Copyright can be applied on

All of these

(dramatic works,

artistic and

musical works)

Content Risks include

Harmful Advice

Information security Risks include

Malicious code

To select shapes that are hidden or behind the text we can Click

Select objects

We have paste options

Multiple

Font group includes options

All of these

(Typefaces,

Highlight,

fontsize)

by Atiq Kundi

Attacks can be made to prevent access to websites by crashing

Servers

Paragraph group have option

Shading

Arial is a famous type of

Font family

Sometimes when a device is continuously running it damages us by

Radiations

In some cases, the data collection process is readily apparent; in others it

Subtle

Usual way of protecting software is

Copyright

When we apply header it is shown at

Every page of the document

Programming languages are well-designed so that each statement has

Only one

AI is helping to make

Robots

We have to write an equation with 2 as a number and 3 as its power. Which option can be used for this purpose:

Superscript

by Atiq Kundi

In context of environment, computer science have impacts:

Both

positive &negative

Shortcut key of Cut is

Ctrl+x

Paste option is a part of home ribbon group called:

Clipboard

The communication between people because of computer science has:

improved

Eye for long amount of time is not meant to look

2D

Home ribbon contains groups

All of these

(Paragraph,

Font,

Clipboard)

We can highlight a text from

font

by Atiq Kundi

Ms Word is an example of:

Word processing

Content filters are part of Internet

Firewalls

The default theme of MS word is

Office

Table group is a part of ribbon

Insert

We can decrease indent from

Paragraph

Insert tab can have group

Pages

If we want to end a page at a specific point and move to the next page we can use: **Page break**

Computer science helps in faster response times through

All of the given

Access to the forbidden literature because of:

Computer

Style groups in MS word can have

Shading

Data can come from

All of these

(Emails,

by Atiq Kundi

Personal software,

Passwords)

Gaming addiction can cause problems:

Financial

Content filtering is serving for purpose of

All of these

(Security,

Socialism,

Transaction)

The style group in the home ribbon is the

Fourth group

We can set line spacing from group

Paragraph

Self-driven cars are example of

AI

Legal notations to control digital ownership are

Copyrights

The fifth group in the home ribbon is the

Editing

Find option includes

All of these

(Find,

Advance find,

by Atiq Kundi

Goto)

Shortcut key to select whole text in a document

Ctrl+a

The Turing test result of program DOCTOR developed by Joseph

Weizen baum was
Passed Increased

Pre written mathematical expressions or formulas are called

Symbol

In turn the collected information is potentially available to

all of these

(marketing firms,

political parties,

employers)

The field of linguistic tends towards which direction

Theoretical

CAN-SPAM Act applies in

US

Data mining is practice done data collections, called data warehouses

Static

Easy access to online health centers is because of

Computer Science

Theoretical track is a part of

by Atiq Kundi

AI domain

The ____approach leads to a simulation-oriented methodology_

Theoretical

The ____approach leads to a performance-oriented methodology

Engineering

Displays the document as it would appear if printed and is the default View

Print Layout

A is a specially formatted letter that appears at the beginning of a paragraph

by Atiq Kundi

just like you see in newspapers or in books.

Drop cap

are a way to keep track of reading.

Bookmarks

Which excess notation is used to represent 100 as Zero?

Excess 4

Page group includes options

cover Page

A mark or any other distinctive sign associated with products is called:

Trademark

We can customize indentation with_

Ruler

by Atiq Kundi

FTP ____ could check all incoming files for the presence of known viruses and block all infected files.

Proxy server

Which is less time sensitive, so the mail servers use _____ to transfer email?

SM TP

Which is correct format to find out a value from any given list?

Search()

Which excess notation is used to represent 10000as zero**?**

Excess 16

A clear flag state indicates that resource is?

Allocated

<a> is called the --------- tag in HTML document?

ANCHOR

While adding 8 bits, there could be possibilities

3

by Atiq Kundi

Post test loop structure refers to?

REPEAT

RISC is abbreviation of

Reduced Instruction Set Computer

The set of tasks that ensures the software is correctly implements a specific function is known as

VERIFICATION

Which of the following is one of the major drawbacks of Skype?

BB

The repetitive use of an instruction or sequence of instructions is an important algorithmic concept. One method of implementing such repetitions is the iterative structure known as the --------?

Loop

Stepwise Refinement is -------Methodology in that it progress from general to specific.

Bottom up

A private key is used to ----------messages

Encrypt

by Atiq Kundi

The bit 0 represents the value of false and the bit 1 represents the value

True

A directories can contain other directories called subdirectories

Constructed
Hierarchal organization

By using 16 bits were used to store 2's complement notation, maximumnumber represented was

32,768

Generally how many steps a machine cycle have

3

What is the full form of JSP?

Java server pages

_____ is also known as character

Space

The memory manager allocates _____

Memory space

by Atiq Kundi

Establishing a well-defined set of building blocks from which algorithm representation can be constructed. Such building blocks are known as

Primitive

Process is a _____ activity

Dynamic activity

---- Loop structure referred to as a posttest loop**.**

Repeat

Digits on left side of point represent file.

Whole numbers

You can uses _____- search engine for searching images, movies, games or educational content

GOOGLE

What does MIDI stand for

Musical Instrument Digital Interface

TLD stand for

Top level Domain

by Atiq Kundi

The device that is used to store data is called

Storage devices

Which of these describe stepwise refinement

Top down approach

----- refers to distributed systems that are more loosely coupled than clusters but that still work together to accomplish large tasks.

GRID COMPUTING

------- is used to store colorful images

PGB

User can see directories or files by using----------

Window explorer

-------- was the first to implement the web

Tim Berners-Lee

0011+0010=_____

0101

Cloud computing services provide reasonable guarantees of and

by Atiq Kundi

.

Scalability, Reliability

By starting the CPU first of all enters in

Mode

A Program that is believed to be correct and the program that is correct. The two are

not necessarily same

----- is a short version of binary digit, a smallest unit to store data._

Bit

The set of tasks that ensures the software is correctly implements a specific function is known as

Verification

In _ _ the operating system may be copied from a distant machine over a network

Small workstations

In SD card technology, SDHC (High Capacity) can provide GBs of storage

32

by Atiq Kundi

In excess notation -------of bits to represent each value

fixed number

MPEG – successfully relayed on communication paths having

40 Mbps transfer rate.

Bit is a

Basic unit of storage

Which of the following is the component name of iterative structures in which initial state is established?

Initialize.

When application wants to display anything on screen, it notifies the

windows manager

Which type of register is used in program execution

Special purpose.

can store unique pattern of 21 bits.

Unicode

by Atiq Kundi

----------could check all incoming files for the presence of known viruses and block all infected files.

FTP proxy server

After fetching instruction will be decoded and

Executed

_____ is used to store colorful images

RGB

The process involved in a is like copying the data rather than moving it.

Instruction

is a package containing a party's name and that party's public key.

Certificate

UTF-8 uses 24 to -----bits

32

The process involved in a ------- is like copying the data rather than moving it.

Data transfer group

by Atiq Kundi

--produces the output as 1 when both of the inputs are 1

AND

Instruction Register: Holding instruction

Being executed now

27 combinations=

128

Programs were part of the

CPU

Binary notation has two following representation

Two's Complement

Which of the following is not the form of existing VoIP systems?

Hard Phones.

_____could be stored in 16 bits

99

by Atiq Kundi

Computer Science establishes set of building blocks from which algorithm can be constructed; such building blocks are known as

Primitive

In CS, we store and link data in an organized way using. DBMS

Each Router Maintains the directions in which messages should be sent based on destination.

Forwarding Table

Controller can connect through a connector that is called

Port

Charles Babbage invited the --------- technology

Punch card

An example of------ technique is consecutive frames of a motion picture?

Relative encoding

Subtraction can be simulated by addition and negation like in

2's complement notation

Non terminating expansions may also be a source of---------- ?

Truncation error

by Atiq Kundi

The loudness of sound varies directly with vibrating.

AMPLITUDE

In binary notation 11111111 is =

255

One kilobyte contains ----- bytes.

1024

operating system is called:

initialize

A long string is often called a

ANSII STRING

Instant messaging in which people carry on a written conversation over the internet?

Peer-to-peer

by Atiq Kundi

In which type of system the operating system is copied from special flash nonvolatile memory

Electronic

George Boole invented the ------- operation.

Boolean

Search engine can search ------- type of information

All

Another problem that can arise during resource allocation is?

Deadlock

A pseudo code must have a consistent, concise notation for representing recurring structures?

SEMANTIC

OR operator is also represented by ------sign

!

There are ----- basic Boolean operations?

4

by Atiq Kundi

Google drive is an example of?

Cloud computing

Which of the following case does not exist in complexity theory?

Null case

When applied to a list with n entries, the binary search algorithm will interrogate an average of ----- entries?

N/2

If 15 are divided by 5 using repetitive subtractions, how many steps it involves?

2

First software for implementing the web was released in?

SEP 1990

Bits can represent in chip as?

0,1 form

ANSI stands for ?

by Atiq Kundi

American national standards institute

Which register contains the address of the next instruction?

Special register

Printer is an ------ device?

Output

Algorithm for finding binary representation of a positive Decimal number contains ------ steps

Three

------ is used to detect and remove the presence of known viruses and other infections

Antivirus

One of the major uses of the -------operation is for placing files 0s in one part of a bit pattern while not disturbing the other part

AND

-------is a form of magnetic system?

HARD DISK

by Atiq Kundi

The CPU can send requests encodes as-------- to the controller

Bit pattern

In main memory each cell has unique --------address

Cells

To control access to printer, the ----must keep track of whether the printer has been allocated?

Operating system

While ( ): here what will be written?

Function

UDP is protocol used for communication; the full form of UDP is

User Datagram protocol

What is the full form of ASP?

ACTIVE SERVER PAGE

Using ---------, you can search images even by giving a query of another image?

by Atiq Kundi

Dedicated web link

What is the full form of CGI?

gateway interface Common

One of the earlier computing device was the

Abacus

FIFO is abbreviation of?

First in First out

------ is a shift operation technique that is to place the bit that fell off the right end in the hole at the left end?

Arithmetic shift

What does HTTP stand for?

HYPERTEXT TRANSFER PROTOCOL

The efficiency of ------ makes it the protocol of choice for DNS lookups and VoIP?

TCP

by Atiq Kundi

An interrupt converts the CPU to privileged mode and transfers control to

Interrupt handler

A program logic written in an ordinary language a structure similar to computer instructions is known as?

Pseudo codes

ENIAC stands for?

Electronic Numerical Integrator and Computer

The application layer uses the -------to send and receive messages over the internet

Transport layer

---------is the most demanded job in U.S.

Software

Pseudo code is language

Algorithm

After how long we should take the sample depends on how

Definition sound recording are required.

Accurate and high

by Atiq Kundi

If you want to search within the range of number, you can use?

Two dots

GIF can obtain compression by using adaptive dictionary system which technique is used by adaptive dictionary system for this purpose

LZE

In binary addition **1+0**

1

The dispatcher allocates------?

Time slices

The ------- in the state of the process must be sufficient to determine uniquely and completely the action required

Information

ASFII code for Alphabet ‘’A’’?

65

notvalidIPaddress

192.168

by Atiq Kundi

the simplest form of array is the ……array

one-dimensional

a array consist of multiples rows and columns in which position are identified by pairs of indices

two- dimensional

columns in a relation are referred to as

attributes

the point at which all the steps in a transactions have been recorded in the log is called the

commit point

we can insert preformatted text through

text box

what will be the output of the following excel formula? If A1=4,B1=6,C1=2

18

using illustrations group we can add

shapes

by Atiq Kundi

table templates can be added through

insert table

which of the following is not a type of page margin in MS word

centre

a good presentation slide should have maximum how many points_

3

we can have an equally spaced paragraph from left and right side

justify

which of the following is valid type of sort in ms excel

basic sort

if we have pasted the text in wrong line and want to cancel this action we can use command

undo

the home tab in excel and power point are

similar

by Atiq Kundi

…… is a set of steps that define how a task is performed

Algorithm

Operation system designed to service multiple users at a same time is called

time sharing

USB and firewire are example of high speed data transfer over an

short distance

Formulas of excel start with

=

Epic is a research Centre that is

Non-profitable

Message sent from source to destination via internet usually passes through ….

Layer architecture

Two

Software licensing terms and conditions usually include

all of the given

by Atiq Kundi

The…….approach would allow search engines to identify recipes that contain that contain or don't contain center ingredients or material

Semartic

Computer science allows hospitals to be managed

Efficiently

Which of the following symbol is used for grouping in a pseudo code

()

A person involved with the entire development process requirement analysis and design step is

software analyst

Which of the following documents is developed in the analysis phase which gives a clear statement of the goals and objective of the project

Design

The idea of storing a computer program in its main memory is known as

stored program concept

Which of the following in the first phase of software development life cycle?

requirements analysis

by Atiq Kundi

Compilers and editors come under which type of software?

system software

Operation calculating NOT of the OR can be represented

NOR

Originally the length of IP address is

32-bits

Which option MS access provides the ability to enter new record and nagigate through existing records easily?

Forms

XML stands for

Extensible markup language

HTML stands for

text markup language

Robots in comparison of humans are able to take blood from the veins

Accurately

by Atiq Kundi

One typical medical robot can alleviate a person …time a day

40

A computer translator is best describe as

system software

Imperative paradigm is also known as

procedural paradigm

Which of the following data type will be used for a variable having only the value o or 1

Boolean

Which of the following is not related to white box testing

structural testing

Style groups in MS-word can have:

Functions

Control structure iterates a set of instructions based on the provided condition called _____

Conditional

by Atiq Kundi

Information security Risks include:

Online scam

Each programming language tends to approach the parallel processing paradigm

and have different terminology. In Ada we use term ….for this purpose.
Thread

The option of bullets is in group:

Paragraph

An analogy to the fact that the development process was allowed to flow in only one direction called

Waterfall model

Content filtering is used to implement company policies related to usage of:

_Information system

5%2 would give

1

Privacy is the "right to be let alone" is written by:

Samuel D. Warren

by Atiq Kundi

"Displaying Text in Two Columns" feature is in which tab of MS Word

Page Layout

------- refers to data items that can take on only the values true or false

Boolean

If we want to end a page at a specific point and move to the next page we can use:

Page end

AI is helping to make

Robots

Which of the following is the contrast of the Declarative paradigm?

Imperative paradigm

Table group is a part of ribbon

Insert

Attacks can be made to prevent access to websites by crashing

Servers

Which of the following statement is used for output in C++?

by Atiq Kundi

cout<<

A model which represents the shift away from strict adherence to the waterfall model is

Iterative model

In the case of highly standardized languages, compiler designers often provide features, sometimes called

Language extension

The system's interface should be designed for the

all of above

Which of the following might be used to convert high-level language instructions into machine language?

An interpreter

True parallel processing requires CPU cores_ ----

Multiple

Which of the following technique is used in software testing that examines the functionality of an application without peering into its internal structures orworkings.

Black box testing

by Atiq Kundi

Which of the following is a robot used in medical field

Belgian robot

In modern computer applications, problems are more easily solved in the context of

Technology

Turing gave a percentage of a machine that will have a chance to pass Turing test in year:

2000

In Belgian Pepper Robot works in

Hospitals

Meaning of a statement in natural language depends on its

Style

Shortcut to insert an end note in MS word

Alt + Ctrl + D

Stakeholders can be

Government agencies

by Atiq Kundi

Gaming addiction can cause problems:

Environmental

Illustration is a part of ribbon

Insert

DBMS stands for

Database management system

What will be the output of the following code? int main() { int x = 9; while (x>0) x=x-1; cout<<x; return 0; }

Both positive & negative

If the result after comparison of two variables in relational operators is False, then if statement returns value

0

Now if the result after comparison of two variables is True, then if statement returns value

1

byAtiq Kundi

A mnemonic system for representing programs is collectively called a numbers

Machine language

Second phase of the development phase of the software development life cycle is

Bb

Which software testing methodology is to develop a set of test data that insures that each instruction in the software is executed at least once?

White-box testing

Each statement in natural language can have

AA

Find option includes:

All of above

A device that responds to stimuli from its environment

Agent

Format painter is in group of

by Atiq Kundi

Design

In particular, the chart that indicates the entire game is overseen by a function named

Control Game

The description of the object's properties is called

Class

Editing group has commands

5

Which one is a unary operator?

NOT

Quick Access Toolbar by default includes:

All of these

The option of strike through is in group:

Font

In modern computer applications, problems are more easily solved in thecontext of

by Atiq Kundi

Technology

Equal to sign is

=

Actions according to environment knowledge:

Reflex action

To retrieve the information about an employee, we must select the with the appropriate identification attribute value from the EMPLOYEE relation.

Table

How many common forms of data mining

Two

The result of ---------- step in the entire development process should be "tested" for accuracy

Each intermediate step

From a lay- person's perspective, design is often equated with

How

The amount of paper American use in a year is:

85 million tons

by Atiq Kundi

Which of the following might be used to convert high-level language instructions into machine language?

An interpreter

Insert tab can have group

Pages

Writing programs in a machine language is a tedious task that often leads to errors that must be located and corrected

Debugging

We have paste options

Multiple

A significant example of iterative techniques is:

Rational unified process

A software license is a _____ between the owner and user of a software product that grants the user certain permissions to use the product without transferring ownership rights to the intellectual property.

Legal agreement

Page group includes options:

by Atiq Kundi

Cover page

The syntax for using && is

Cmd1 && cmd2

Smart art was introduced in MS word version

2007

If the result after comparison of two variables in relational operators is False, then if statement returns value

0

When we apply header it is shown at

Start page of document

A translator which takes assembly language program as input & produce machine language code as output is known as:

Assembler

Theoretical track is a part of

Declarative knowledge

In MS-word different type of effects on the text can be applied with:

All of given

by Atiq Kundi

While and software license agreements provide legal avenues to inhibit outright copying and unauthorized use of software.

Copy rights

Social sites includes:

Twitter

Correct syntax is

If (condition) Statement a Else Statement B.

There we found that a register called a _ program counter is used to hold the address of the next instruction to be executed

Software Engineering is an engineering discipline that is concerned with:

All aspects of software production

Microsoft office includes

Word

In some cases, the data collection process is readily apparent; in others it is:

Subtle

by Atiq Kundi

Access to the forbidden literature is because of:

Computer

which are ideal for storing data that will be processed in the order in the file's entries are stored.

Sequential files

Change case control is an example of:

Dropdown menu

A program DOCTOR developed by Joseph Weizenbaum in the mid1960s named as:

Eliza

Information that was once buried in arcane records has become accessible because of:

Database

Programming languages are well-designed so that each statement has meaning:

Only one

is based on real time factory concept.

Factory pattern

by Atiq Kundi

The fifth group in the home ribbon is the: _

Eliding

Retailers maintain record of their costumers:

Purchases

USA has passed legislation allowing the government to actively monitor citizens in the name of: _

National security

Data mining is practiced on data collections, called data warehouses.

static

The links between in an object-oriented database are normally maintained by the DBMS.

Objects

In which of the following paradigms, a program is constructed by connecting smaller predefined program units.

Functional paradigm

```
int i;
i=1;
While(i<=5)
{cout<<I;
 I=i+1;
```

byAtiqKundi

}

How many times loop will execute

5

Paste option is a part of home ribbon group called

Clipboard

Editing group have commands:

3

People are working in sitting position due to computer science and thus have more chance to develop

Obesity

The style group in the home ribbon is the

Fourth group

The sign of modulus is

%

_ deals with designing systems that harmonize with the physical abilities of humans.

Ergonomics

by Atiq Kundi

The communication between people because of computer science has:

Improved

Content filtering works by matching of characters:

Strings

Easy access to online health centers is because of:

Database

A is a collection whose entries have a hierarchical organization similar to that of an organization chart of a typical company

Tree

Sophisticated packages designed primarily for the software engineering environment known as

DIES

The default theme of MS-Word document is

Office

While and software license agreements provide legal avenues to inhibit outright copying and unauthorized use of software.

Copyrights

by Atiq Kundi

The option of justify is in group:

Paragraph

---------stages about developing a solution to the problem

Design

A is a description of only that portion of the database pertinent to a particular user's needs._

Subschema

Which is Boolean operator for logical AND.

&

Content Risks include

Harmful Advice

One operation we might want to perform on a relation is to select possessing certain characteristics and to place these selected in a new relation.

tuple, tuple

In the case of highly standardized languages, compiler designers often provide features, sometimes called

Language extension

We can add charts in MS-word from group:

Table

by Atiq Kundi

Turing test was purposed in:

1950

Act that ranges government restrictions on wire taps to include transmissions of data is

ECPA

Computer science helps in faster response times through:

All of given

In _ software tester is aware of the interior structure of the software and uses this knowledge when designing the test.

Black-box testing

The field of artificial intelligence is being pursued along paths

3

Software licenses are

All of these

Requiring certain degree of uniformity of the style, size and orientation of symbols is a(n):

CCCC

by Atiq Kundi

The term programming paradigm is a misnomer. A more realistic term would be Non-Procedural paradigms

Nontraditional paradigms

In turn the collected information is potentially available to:

All of these

Major component of syntactic analysis is:

DD

In assembly language, the instructions like MOV or ADD are called as

OP-Code

We have to write an equation with 2 as a number and 3 as its power. Which option can be used for this purpose?

BB

The imperative paradigm, also known as the Particular machine

Procedural paradigms

Third generation language attributes refer to

_ Particular machine

by Atiq Kundi

Computer security is also known as:

Cyber-security

In _ if two modules interact with the same item of data, then modifications made to one module may affect the other.

Data coupling

Retailers maintain record of their costumers:

Purchases

Each programming language tends to approach the parallel processing paradigm

and have different terminology. In Ada we use term ….for this purpose

Task

A specific example is the series of standards, which address numerous industrial activities such as design, production, installation and servicing.

ISO 9000

In Object Oriented Paradigm, each object will have its own collection of functions which is known as:

Classes

by Atiq Kundi

Pages is an option in the ribbon:

Insert

Learning procedural knowledge usually involves a process

Trial-and-error

A model which represents the shift away from strict adherence to the waterfall model is

Iterative model

Distinction between software engineering and other engineering disciplines isthe lack of quantitative techniques, called

Metrics

The term cohesion refers to this

logical cohesion

Ethical issues are related to:

Moral principles

Modules come in a variety of

Forms

begins the paragraph with a large letter that spills down into the text:

Drop cap

by Atiq Kundi

Plagiarism is a major problem in:

Education

Shortcut key of cut is:

Ctrl+x

Which intermodal coupling occurs when a module passes control of execution to another, as in a function call

control coupling

Process of understanding what the characteristics of images means refers

To
Analysis

This _ view of the database is called a database model

Conceptual

If we want to end a page at a specific point and move to the next page we can use

Page end

A file's is normally stored as a separate file on the same mass storage

by Atiq Kundi

device as the
index , indexed file

Declarative paradigms system is design for

All of these

A is a pre-developed model for solving a recurring problem in software design

Design pattern

The conceptual shape or arrangement of data is known as

Data structure

Which of the following language is related to functional paradigm?

Python

This conceptual view of the database is called a model.

Database

Electronic Theft include

Cyber bullying

by Atiq Kundi

Control structure iterates a set of instructions based on the provided condition called

Loop

Shortcut key of paste is:

Ctrl+v

Which from the following is not a relational operator?

! =

We can highlight a text from group:

Font

Reports can be received at home through email because of advancement in:

Artificial intelligence

CAN-SPAM Act applies in:

US

In particular, the chart that indicates the entire game is overseen by a function named

Control game

A translator which takes assembly language program as input & produce machine language code as output is known as:

Assembler

by Atiq Kundi

Which of the following is social issue?

All of given

A rapidly expanding subject that is closely associated with database technology is which consists of techniques for discovering patterns in collectionsof data

Data mining

Assignment statement is

=

The term refers to a collection of data that is multidimensional in the sense that internal links between its entries make the information accessible from a variety of perspectives.___

Database

The statement z=x+y shows

The sum of X and Y be assigned to the variable Z

The Turing test result of program DOCTOR developed by Joseph Weizenbaum was:

Ambiguous

by Atiq Kundi

A process which is used by the software industry to design, develop and testhigh quality software is known as

Software life cycle

Shortcut key to select the whole text in a document

Ctrl+a

In the case of the incremental model these prototypes evolve into the complete, final system, a process known as

Word

Design ribbon can have:

Page border

The option of strike through is in group

Particular machine

The field of artificial intelligence is being pursued along paths

2

Design phase is followed by

by Atiq Kundi

Implementation

The point at which all the steps in a transaction have been recorded in the log is called the

commit point

"Displaying Text in Two Columns" feature is in which tab of MS Word? Page Layout

Command that can immediately go to a page or any marked location within your document:

Go to

Ctrl+y is used for:

Redo

by Atiq Kundi

CS-101 Final-Term BY Attiq Kundi

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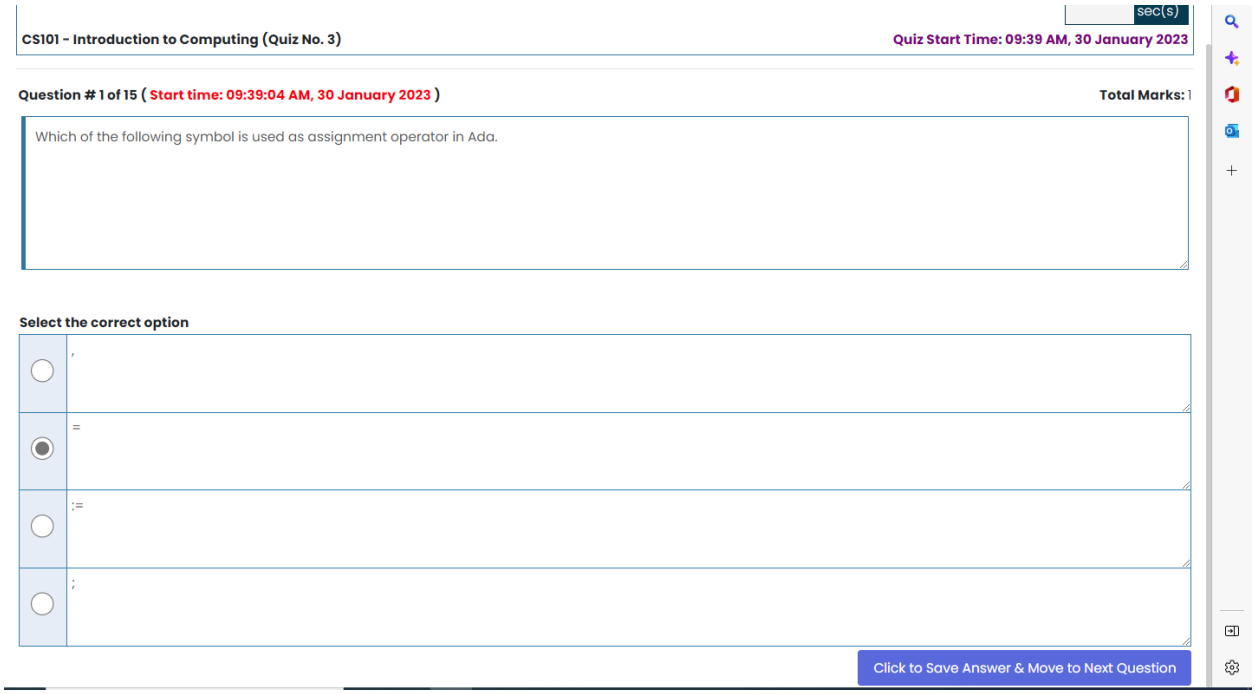
(Updated at 30-01-2023)

by Attiq Kundi

Quiz#03

Cs101 introduction to computing

Dated: 30-01-2023



CS101 - Introduction to Computing (Quiz No. 3) Quiz Start Time: 09:39 AM, 30 January 2023

Question # 2 of 15 (Start time: 09:40:39 AM, 30 January 2023) **Total Marks:** 1

The statement z=x+y shows

Select the correct option

- ○ The sum of x and z be assigned to the variable y
- ◉ The sum of X and Y be assigned to the variable Z
- ○ The X and Y be assigned to the variable Z
- ○ The Y be assigned to the variable Z

Click to Save Answer & Move to Next Question

CS101 - Introduction to Computing (Quiz No. 3) Quiz Start Time: 09:39 AM, 30 January 2023

Question # 3 of 15 (Start time: 09:41:33 AM, 30 January 2023) **Total Marks:** 1

_____ is exemplified by two transactions, each of which makes a deduction from the same account.

Select the correct option

- ○ Time sharing
- ○ Incorrect summary problem
- ◉ Lost update problem
- ○ Potential problem

Click to Save Answer & Move to Next Question

CS101 - Introduction to Computing (Quiz No. 3) Quiz Start Time: 09:39 AM, 30 January 2023

Question # 4 of 15 (Start time: 09:42:19 AM, 30 January 2023) **Total Marks:** 1

Which of the following symbol is used to represent Boolean operator for logical AND?

Select the correct option

Reload Math Equations

- ○ &|
- ○ ||
- ● &&
- ○ !&

Click to Save Answer & Move to Next Question

CS101 - Introduction to Computing (Quiz No. 3) Quiz Start Time: 09:39 AM, 30 January 2023

Question # 5 of 15 (Start time: 09:44:50 AM, 30 January 2023) **Total Marks:** 1

The sign of modulus is

Select the correct option

- ○ \
- ● %
- ○ *
- ○ /

Click to Save Answer & Move to Next Question

sec(s)

CS101 - Introduction to Computing (Quiz No. 3) **Quiz Start Time: 09:39 AM, 30 January 2023**

Question # 6 of 15 (Start time: 09:45:51 AM, 30 January 2023) **Total Marks:** 1

_____ Model allows the development process only in one direction.

Select the correct option

Reload Math Equations

- ○ Spiral
- ○ RAD
- ○ Incremental
- ◉ Waterfall

Click to Save Answer & Move to Next Question

Time Left sec(s)

CS101 - Introduction to Computing (Quiz No. 3) **Quiz Start Time: 09:39 AM, 30 January 2023**

Question # 7 of 15 (Start time: 09:47:24 AM, 30 January 2023) **Total Marks:** 1

GOMS model is based on_____.

Select the correct option

Reload Math Equations

- ◉ machine behavior
- ○ hardware architecture
- ○ software documentation
- ○ human behaviors

Click to Save Answer & Move to Next Question

sec(s)

CS101 - Introduction to Computing (Quiz No. 3) Quiz Start Time: 09:39 AM, 30 January 2023

Question # 8 of 15 (Start time: 09:49:03 AM, 30 January 2023) Total Marks: 1

------- refers to data items that can take on only the values true or false

Select the correct option

- (●) Boolean
- ( ) Int
- ( ) Float
- ( ) Char

Click to Save Answer & Move to Next Question

CS101 - Introduction to Computing (Quiz No. 3) Quiz Start Time: 09:39 AM, 30 January 2023

Question # 9 of 15 (Start time: 09:49:35 AM, 30 January 2023) Total Marks: 1

An alternative to translators

Select the correct option

- ( ) Mnemonics
- ( ) Assembler
- (●) Interpreter
- ( ) Compiler

Click to Save Answer & Move to Next Question

sec(s)

CS101 - Introduction to Computing (Quiz No. 3) **Quiz Start Time: 09:39 AM, 30 January 2023**

Question # 10 of 15 (Start time: 09:50:42 AM, 30 January 2023) **Total Marks:** 1

A---------- alters the execution sequence of the program

Select the correct option

- ( ) Modulus
- ( ) Assignment statement
- (•) Control statement
- ( ) Division

Click to Save Answer & Move to Next Question

sec(s)

CS101 - Introduction to Computing (Quiz No. 3) **Quiz Start Time: 09:39 AM, 30 January 2023**

Question # 11 of 15 (Start time: 09:51:02 AM, 30 January 2023) **Total Marks:** 1

_____ is a phase that makes distinction between the tasks of a software Analyst and a Programmer.

Select the correct option

Reload Math Equations

- ( ) Implementation
- (•) Analysis
- ( ) Design
- ( ) Testing

Click to Save Answer & Move to Next Question

CS101 - Introduction to Computing (Quiz No. 3)

Quiz Start Time: 09:39 AM, 30 January 2023

Question # 12 of 15 (Start time: 09:52:20 AM, 30 January 2023)

Total Marks: 1

The links between _____ in an object-oriented database are normally maintained by the DBMS.

Select the correct option

- forms
- objects
- local data
- functions

Click to Save Answer & Move to Next Question

CS101 - Introduction to Computing (Quiz No. 3)

Quiz Start Time: 09:39 AM, 30 January 2023

Question # 13 of 15 (Start time: 09:53:22 AM, 30 January 2023)

Total Marks: 1

Which of the following data type will be used for a variable having string of symbols and alphabets.

Select the correct option

- Integer
- Boolean
- Float
- Character

Click to Save Answer & Move to Next Question

sec(s)

CS101 - Introduction to Computing (Quiz No. 3) **Quiz Start Time: 09:39 AM, 30 January 2023**

Question # 14 of 15 (Start time: 09:54:51 AM, 30 January 2023) **Total Marks:** 1

Which one of the following groups control and enforce the quality control systems.

Select the correct option

Reload Math Equations

- (●) SQA
- ( ) SQL
- ( ) DDL
- ( ) CPL

Click to Save Answer & Move to Next Question

sec(s)

CS101 - Introduction to Computing (Quiz No. 3) **Quiz Start Time: 09:39 AM, 30 January 2023**

Question # 15 of 15 (Start time: 09:55:45 AM, 30 January 2023) **Total Marks:** 1

In _____ paradigm, task of programmer is to develop a precise problem statement rather than designing an algorithm for solving the problem.

Select the correct option

Reload Math Equations

- ( ) Object-Oriented
- ( ) Imperative
- (●) Declarative
- ( ) Functional

Click to Save Answer & Move to Next Question

sec(s)

CS101 - Introduction to Computing (Quiz No. 3) **Quiz Start Time: 10:08 AM, 30 January 2023**

Question # 1 of 15 (Start time: 10:08:59 AM, 30 January 2023) **Total Marks:** 1

What does SDLC stand for in the development environment?

Select the correct option

Reload Math Equations

- (●) Software Development Life Cycle
- ( ) System Development Life Cycle
- ( ) Software Design Life Cycle
- ( ) System Design Life cycle

Click to Save Answer & Move to Next Question

sec(s)

CS101 - Introduction to Computing (Quiz No. 3) **Quiz Start Time: 10:08 AM, 30 January 2023**

Question # 2 of 15 (Start time: 10:09:53 AM, 30 January 2023) **Total Marks:** 1

ISO makes software _____ for software companies to guarantee quality control.

Select the correct option

Reload Math Equations

- (●) Software
- ( ) Queries
- ( ) Standards
- ( ) Hardware

Click to Save Answer & Move to Next Question

sec(s)

CS101 - Introduction to Computing (Quiz No. 3) **Quiz Start Time: 10:08 AM, 30 January 2023**

Question # 4 of 15 (Start time: 10:11:06 AM, 30 January 2023) **Total Marks:** 1

The set of instructions in a computer language, to get the desired result is known as:

Select the correct option

- ( ) A decision table
- ( ) A pseudo code
- (•) An algorithm
- ( ) A program

Click to Save Answer & Move to Next Question

sec(s)

CS101 - Introduction to Computing (Quiz No. 3) **Quiz Start Time: 10:08 AM, 30 January 2023**

Question # 5 of 15 (Start time: 10:11:47 AM, 30 January 2023) **Total Marks:** 1

5%2 would give

Select the correct option

- ( ) 5
- ( ) 0
- ( ) 2
- (•) 1

Click to Save Answer & Move to Next Question

sec(s)

CS101 - Introduction to Computing (Quiz No. 3) **Quiz Start Time: 10:08 AM, 30 January 2023**

Question # 6 of 15 (Start time: 10:12:28 AM, 30 January 2023) **Total Marks:** 1

Which of the following is incorrect scenario for Shopping Cart Design patterns?

Select the correct option

Reload Math Equations

- (●) User needs to buy a single product
- ( ) Paying money later on
- ( ) User is intended to buy more products
- ( ) Do not use in case of single product to sell

Click to Save Answer & Move to Next Question

sec(s)

CS101 - Introduction to Computing (Quiz No. 3) **Quiz Start Time: 10:08 AM, 30 January 2023**

Question # 7 of 15 (Start time: 10:13:41 AM, 30 January 2023) **Total Marks:** 1

Which of the following language is related to functional paradigm.

Select the correct option

- (●) LISP
- ( ) Smalltalk
- ( ) Prolog
- ( ) Python

Click to Save Answer & Move to Next Question

CS101 - Introduction to Computing (Quiz No. 3) Quiz Start Time: 10:08 AM, 30 January 2023

Question # 8 of 15 (Start time: 10:14:35 AM, 30 January 2023) Total Marks: 1

Which software testing refers to tests that do not rely on knowledge of the software's interior composition?

Select the correct option

- glass-box testing
- white-box testing
- black-box testing
- basis path testing

Click to Save Answer & Move to Next Question

CS101 - Introduction to Computing (Quiz No. 3) Quiz Start Time: 10:08 AM, 30 January 2023

Question # 9 of 15 (Start time: 10:15:00 AM, 30 January 2023) Total Marks: 1

Which of the following is not a relational operator in C++?

Select the correct option

Reload Math Equations

- %=
- ! =
- > =
- = =

Click to Save Answer & Move to Next Question

sec(s)

CS101 - Introduction to Computing (Quiz No. 3) Quiz Start Time: 10:08 AM, 30 January 2023

Question # 10 of 15 (Start time: 10:15:35 AM, 30 January 2023) Total Marks: 1

The sign of modulus is

Select the correct option

- (●) %
- ( ) /
- ( ) *
- ( ) \

Click to Save Answer & Move to Next Question

sec(s)

CS101 - Introduction to Computing (Quiz No. 3) Quiz Start Time: 10:08 AM, 30 January 2023

Question # 11 of 15 (Start time: 10:15:53 AM, 30 January 2023) Total Marks: 1

Which of the following is the correct syntax to initialize a 3-element integer array in C/C++?

Select the correct option

Reload Math Equations

- ( ) int arr(3) = {1,2,3}
- (●) int arr(3) = (1,2,3);
- ( ) int arr[3] = {1,2,3}
- ( ) int arr[3] = (1,2,3)

Click to Save Answer & Move to Next Question

CS101 - Introduction to Computing (Quiz No. 3)

Quiz Start Time: 10:08 AM, 30 January 2023

Question # 12 of 15 (Start time: 10:17:05 AM, 30 January 2023)

Total Marks: 1

Which one is not a valid data type?

Select the correct option

- ○ Html
- ○ Char
- ○ Int
- ◉ Float

Click to Save Answer & Move to Next Question

CS101 - Introduction to Computing (Quiz No. 3)

Quiz Start Time: 10:08 AM, 30 January 2023

Question # 13 of 15 (Start time: 10:18:14 AM, 30 January 2023)

Total Marks: 1

A---------- alters the execution sequence of the program

Select the correct option

- ○ Modulus
- ○ Assignment statement
- ○ Division
- ◉ Control statement

Click to Save Answer & Move to Next Question

sec(s)

CS101 - Introduction to Computing (Quiz No. 3) **Quiz Start Time: 10:08 AM, 30 January 2023**

Question # 14 of 15 (Start time: 10:18:39 AM, 30 January 2023) **Total Marks:** 1

What will be the output of the following statement?
int a = 10 + 4.867;

Select the correct option

- (●) 14.867
- ( ) 10
- ( ) Compiler error.
- ( ) 14

Click to Save Answer & Move to Next Question

sec(s)

CS101 - Introduction to Computing (Quiz No. 3) **Quiz Start Time: 10:08 AM, 30 January 2023**

Question # 15 of 15 (Start time: 10:19:03 AM, 30 January 2023) **Total Marks:** 1

Stakeholders can be a

Select the correct option

- ( ) Schools
- (●) Government agencies
- ( ) Government policies
- ( ) Lawyers

Click to Save Answer & Move to Next Question

CS101 - Introduction to Computing (Quiz No. 3) Quiz Start Time: 10:33 AM, 30 January 2023

Question # 1 of 15 (Start time: 10:33:22 AM, 30 January 2023) **Total Marks:** 1

The simplest form of array is the _____array.

Select the correct option

- (●) one-dimensional
- ( ) two-dimensional
- ( ) all of above
- ( ) multi-dimensional

Click to Save Answer & Move to Next Question

CS101 - Introduction to Computing (Quiz No. 3) Quiz Start Time: 10:33 AM, 30 January 2023

Question # 2 of 15 (Start time: 10:33:50 AM, 30 January 2023) **Total Marks:** 1

Third generation language attributes refer to

Select the correct option

- ( ) For all machine
- (●) For only required machine
- ( ) None of these
- ( ) Particular machine

Click to Save Answer & Move to Next Question

CS101 - Introduction to Computing (Quiz No. 3) Quiz Start Time: 10:33 AM, 30 January 2023

Question # 3 of 15 (Start time: 10:35:07 AM, 30 January 2023) Total Marks: 1

Stakeholders can be a

Select the correct option

- [ ] Lawyers
- [ ] Schools
- [x] Government agencies
- [ ] Government policies

Click to Save Answer & Move to Next Question

CS101 - Introduction to Computing (Quiz No. 3) Quiz Start Time: 10:33 AM, 30 January 2023

Question # 4 of 15 (Start time: 10:35:21 AM, 30 January 2023) Total Marks: 1

Which documentation is required that can be used for software maintenance later on in the Software Life Cycle?

Select the correct option

Reload Math Equations

- [ ] User documentation
- [x] Quality assurance documentation
- [ ] System documentation
- [ ] Technical documentation

Click to Save Answer & Move to Next Question

sec(s)

CS101 - Introduction to Computing (Quiz No. 3) Quiz Start Time: 10:33 AM, 30 January 2023

Question # 5 of 15 (Start time: 10:35:55 AM, 30 January 2023) Total Marks: 1

True parallel processing requires ------- CPU cores

Select the correct option

- ( ) Single
- ( ) Exact two cores
- ( ) None of these
- (•) Multiple

Click to Save Answer & Move to Next Question

sec(s)

CS101 - Introduction to Computing (Quiz No. 3) Quiz Start Time: 10:33 AM, 30 January 2023

Question # 6 of 15 (Start time: 10:36:19 AM, 30 January 2023) Total Marks: 1

The Incremental Model can be equated some times with the _____Model.

Select the correct option

Reload Math Equations

- ( ) V shaped
- ( ) Iterative
- (•) Waterfall
- ( ) VU Process

Click to Save Answer & Move to Next Question

sec(s)

CS101 - Introduction to Computing (Quiz No. 3) **Quiz Start Time: 10:33 AM, 30 January 2023**

Question # 7 of 15 (Start time: 10:37:03 AM, 30 January 2023) **Total Marks:** 1

Which of the following is the correct syntax for conditional statement?

Select the correct option

Reload Math Equations

- ○ If condition) Statement A Else Statement B.
- ◉ If (condition) Statement A Else Statement B.
- ○ If (condition)
- ○ If (condition Statement A Else Statement B.

Click to Save Answer & Move to Next Question

sec(s)

CS101 - Introduction to Computing (Quiz No. 3) **Quiz Start Time: 10:33 AM, 30 January 2023**

Question # 8 of 15 (Start time: 10:37:44 AM, 30 January 2023) **Total Marks:** 1

In Structure Chart functions are represented by_____.

Select the correct option

Reload Math Equations

- ◉ Arrows
- ○ Triangles
- ○ Circles
- ○ Rectangles

Click to Save Answer & Move to Next Question

CS101 - Introduction to Computing (Quiz No. 3)

Quiz Start Time: 10:33 AM, 30 January 2023

Question # 9 of 15 (Start time: 10:38:27 AM, 30 January 2023) **Total Marks:** 1

```
While(i<=5)
{
Cout<<i;
I=i+1;
}
```

How many times loop will execute?

Select the correct option

- 4
- 3
- 5 (selected)
- 2

Click to Save Answer & Move to Next Question

CS101 - Introduction to Computing (Quiz No. 3)

Quiz Start Time: 10:33 AM, 30 January 2023

Question # 10 of 15 (Start time: 10:38:53 AM, 30 January 2023) **Total Marks:** 1

Which of the following statement is used for output in C++.

Select the correct option

- cin>>
- cout>>
- cout<< (selected)
- cin>>

Click to Save Answer & Move to Next Question

sec(s)

CS101 - Introduction to Computing (Quiz No. 3) Quiz Start Time: 10:33 AM, 30 January 2023

Question # 11 of 15 (Start time: 10:39:49 AM, 30 January 2023) Total Marks: 1

The sign of modulus is

Select the correct option

- /
- \
- %
- *

Click to Save Answer & Move to Next Question

sec(s)

CS101 - Introduction to Computing (Quiz No. 3) Quiz Start Time: 10:33 AM, 30 January 2023

Question # 12 of 15 (Start time: 10:39:57 AM, 30 January 2023) Total Marks: 1

The description of the object's properties is called

Select the correct option

- Class
- Object
- Function
- Instance

Click to Save Answer & Move to Next Question

CS101 - Introduction to Computing (Quiz No. 3) Quiz Start Time: 10:33 AM, 30 January 2023

Question # 13 of 15 (Start time: 10:40:44 AM, 30 January 2023) **Total Marks:** 1

This _____ view of the database is called a database model.

Select the correct option

- ○ empirical
- ○ theoretical
- ◉ conceptual
- ○ logical

Click to Save Answer & Move to Next Question

CS101 - Introduction to Computing (Quiz No. 3) Quiz Start Time: 10:33 AM, 30 January 2023

Question # 14 of 15 (Start time: 10:41:13 AM, 30 January 2023) **Total Marks:** 1

Which software testing refers to tests that do not rely on knowledge of the software's interior composition?

Select the correct option

- ◉ black-box testing
- ○ basis path testing
- ○ glass-box testing
- ○ white-box testing

Click to Save Answer & Move to Next Question

sec(s)

CS101 - Introduction to Computing (Quiz No. 3)

Quiz Start Time: 10:33 AM, 30 January 2023

Question # 15 of 15 (Start time: 10:41:35 AM, 30 January 2023)

Total Marks: 1

In the case of highly standardized languages, compiler designers often provide features, sometimes called

Select the correct option

- Language translators
- Language extension
- Language symbols
- Language code

Click to Save Answer & Move to Next Question

Solved by: *Badar Iqbal*

Virtual University	CS101-Intorduction to Computing (Solved Macq's) LECTURE FROM (23 to 45)	VU LMS HELP vulmshelp.com
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1. The result of---------- step in the entire development process should be “tested” for accuracy

Each intermediate step

2. From a lay- person’s perspective, design is often equated with

How

3. The amount of paper American use in a year is:

85 million tons

4. Which of the following might be used to convert high-level language instructions into machine language?

An interpreter

5. Table group is a part of_____ribbon:

Insert

6. Attacks can be made to prevent access to websites by crashing:

Servers

7. Which of the following statement is used for output in C++?

cout<<

8. A model which represents the shift away from strict adherence to the waterfall model is:

Iterative model

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9. A rapidly expanding subject that is closely associated with database technology is_____, which consists of techniques for discovering patterns in collections of data.

Data mining

10. In the case of highly standardized languages, compiler designers often provide features, sometimes called

Language extension

11. The system's interface should be designed for the _____.

all of above

12. Which of the following might be used to convert high-level language instructions into machine language?

An interpreter

13. True parallel processing requires-------- CPU cores

Multiple

14. Which of the following technique is used in software testing that examines the functionality of an application without peering into its internal structures or workings.

Black box testing

15. Which of the following is a robot used in medical field :

Belgian robot

16. In modern computer applications, problems are more easily solved in the context of:

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Technology

17. Turing gave a percentage of a machine that will have a chance to pass Turing test in year:

2000

18. In Belgian Pepper Robot works in:

Hospitals

19. Meaning of a statement in natural language depends on its:

Style

20. Shortcut to insert an end note in MS word is

Alt + Ctrl + D

21. Stakeholders can be a

Government agencies

22. Gaming addiction can cause problems:

Environmental

23. Illustration is a part of ribbon:

Insert

24. DBMS stands for_____?

Database management system

25. What will be the output of the following code?

```
int main()
{
```

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```
int x = 9;

while (x>0)

x=x-1;

cout<<x;

return 0;

}
```

0

26. In context of health, computer sciences have impacts:

Both positive & negative

27. If the result after comparison of two variables in relational operators is False, then if statement returns value.

0

28. Now if the result after comparison of two variables is True, then if statement returns value

1

29. A mnemonic system for representing programs is collectively called a numbers

Machine language

30. Second phase of the development phase of the software development life cycle is:

Bb

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31. Which software testing methodology is to develop a set of test data that insures that each instruction in the software is executed at least once?

White-box testing

32. Each statement in natural language can have:

AA

33. Find option includes:

All of above

34. A device that responds to stimuli from its environment:

Agent

35. Format painter is in group of:

Design

36. In particular, the chart that indicates the entire game is overseen by a function named ______

Control Game,

37. The description of the object's properties is called

Class

38. Editing group has commands:

5

39. Style groups in MS-word can have:

Functions

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40. Control structure iterates a set of instructions based on the provided condition called

Conditional

41. Information security Risks include:

Online scam

42. Each programming language tends to approach the parallel processing paradigm and have different terminology. In Ada we use term ….for this purpose.

Thread

43. The option of bullets is in group:

Paragraph

44. An analogy to the fact that the development process was allowed to flow in only one direction called

Waterfall model

45. Content filtering is used to implement company policies related to usage of:

Information system

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46. 5%2 would give

1

47. Which of the following symbol is used at the end of the line to separate statements in many imperative languages?

;

48. Privacy is the "right to be let alone" is written by:

Samuel D. Warren

49. "Displaying Text in Two Columns" feature is in which tab of MS Word?

Page Layout

50. ------- refers to data items that can take on only the values true or false

Boolean

51. If we want to end a page at a specific point and move to the next page we can use:

Page end

52. AI is helping to make:

Robots

53. Which of the following is the contrast of the Declarative paradigm?

Imperative paradigm

54. Which one is a unary operator?

NOT

55. Quick Access Toolbar by default includes:

All of these

56. The option of strike through is in group:

Font

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57. In modern computer applications, problems are more easily solved in the context of:

Technology

58. Equal to sign is

=

59. Actions according to environment knowledge:

Reflex action

60. To retrieve the information about an employee, we must select the _____with the appropriate identification attribute value from the EMPLOYEE relation.

Table

61. How many common forms of data mining?

Two

62. Insert tab can have group:

Pages

63. Writing programs in a machine language is a tedious task that often leads to errors that must be located and corrected

Debugging

64. We have paste options:

Multiple

65. A significant example of iterative techniques is:

Rational unified process

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66. A software license is a _____ between the owner and user of a software product that grants the user certain permissions to use the product without transferring ownership rights to the intellectual property.

Legal agreement

67. Page group includes options:

Cover page

68. The syntax for using && is:

Cmd1 && cmd 2

69. Smart art was introduced in MS word version

2007

70. If the result after comparison of two variables in relational operators is False, then if statement returns value

0

71. When we apply header it is shown at:

Start page of document

72. A translator which takes assembly language program as input & produce machine language code as output is known as:

Assembler

73. Theoretical track is a part of:

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Declarative knowledge

74. In MS-word different type of effects on the text can be applied with:

All of given

75. While_____and software license agreements provide legal avenues to inhibit outright copying and unauthorized use of software.

Copy rights

76. Social sites includes:

Twitter

77. Correct syntax is:

If (condition) Statement a Else Statement B.

78. There we found that a register called a_____is used to hold the address of the next instruction to be executed.

program counter

79. Software Engineering is an engineering discipline that is concerned with:

All aspects of software production

80. Microsoft office includes:

Word

81. In some cases, the data collection process is readily apparent; in others it is:

Subtle

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82. Access to the forbidden literature is because of:

Computer

83. _____are ideal for storing data that will be processed in the order in which the file's entries are stored.

Sequential files

84. Change case control is an example of:

Dropdown menu

85. A program DOCTOR developed by Joseph Weizenbaum in the mid-1960s named as:

Eliza

86. Information that was once buried in arcane records has become accessible because of:

Database

87. Meaning of a statement in natural language depends on the manner in which it is:

88. Programming languages are well-designed so that each statement has_____meaning:

Only one

89. _____is based on real time factory concept.

Factory pattern

90. The fifth group in the home ribbon is the:

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Eliding

91. Retailers maintain record of their costumers:

Purchases

92. USA has passed legislation allowing the government to actively monitor citizens in the name of:

National security

93. Data mining is practiced on_____data collections, called data warehouses.

static

94. The links between_____in an object-oriented database are normally maintained by the DBMS.

Objects

95. In which of the following paradigms, a program is constructed by connecting smaller predefined program units.

Functional paradigm

```
Int i=1;
While(i<=5)
{
Cout<<i;
I=i+1;
}
```

How many times loop will execute?

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5

96. Paste option is a part of home ribbon group called:

Clipboard

97. Editing group have commands:

3

98. People are working in sitting position due to computer science and thus have more chance to develop:

Obesity

99. The style group in the home ribbon is the:

Fourth group

100. The sign of modulus is

%

101. _____ deals with designing systems that harmonize with the physical abilities of humans.

Ergonomics

102. The communication between people because of computer science has:

Improved

103. Content filtering works by matching_____of characters:

Strings

104. Easy access to online health centres is because of:

Database

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105. A_____is a collection whose entries have a hierarchical organization similar to that of an organization chart of a typical company.

Tree

106. Sophisticated packages designed primarily for the software engineering environment known as

DIES

107. The default theme of MS-Word document is:

Office

108. While_____and software license agreements provide legal avenues to inhibit outright copying and unauthorized use of software.

Copyrights

109. The option of justify is in group:

Paragraph

110. ---------stages about developing a solution to the problem

Design

111. A_____is a description of only that portion of the database pertinent to a particular user's needs.

Subschema

112. 1Which is Boolean operator for logical AND.

&

113. Content Risks include:

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Harmful Advice

114. One operation we might want to perform on a relation is to select_____possessing certain characteristics and to place these selected _____in a new relation.

tuple, tuple

115. In the case of highly standardized languages, compiler designers often provide features, sometimes called

Language extension

116. We can add charts in MS-word from group:

Table

117. 1Turing test was purposed in:

1950

118. 1Act that ranges government restrictions on wire taps to include transmissions of data is:

ECPA

119. Computer science helps in faster response times through:

All of given

120. In_____software tester is aware of the interior structure of the software and uses this knowledge when designing the test.

Black-box testing

121. The field of artificial intelligence is being pursued along paths:

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3

122. 1Software licenses are:

All of these

123. Requiring certain degree of uniformity of the style, size and orientation of symbols is a(n):

CCCC

124. The term programming paradigm is a misnomer. A more realistic term would be Non-Procedural paradigms

Nontraditional paradigms

125. 1In turn the collected information is potentially available to:

All of these

126. Major component of syntactic analysis is:

DD

127. In assembly language, the instructions like MOV or ADD are called as_____

OP-Code

128. We have to write an equation with 2 as a number and 3 as its power. Which option can be used for this purpose?

BB

129. The imperative paradigm, also known as the Particular machine

Procedural paradigms

130. Third generation language attributes refer to

Particular machine

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131. Computer security is also known as:

Cyber-security

132. In_____if two modules interact with the same item of data, then modifications made to one module may affect the other.

Data coupling

133. Retailers maintain record of their costumers:

Purchases

134. Each programming language tends to approach the parallel processing paradigm and have different terminology. In Ada we use term ….for this purpose.

Task

135. A specific example is the _____series of standards, which address numerous industrial activities such as design, production, installation and servicing.

ISO 9000

136. In Object Oriented Paradigm, each object will have its own collection of functions which is known as:

Classes

137. 1Pages is an option in the ribbon:

Insert

138. Learning procedural knowledge usually involves a process:

Trial-and-error

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139. A model which represents the shift away from strict adherence to the waterfall model is:

Iterative model

140. Distinction between software engineering and other engineering disciplines is the lack of quantitative techniques, called

Metrics

141. The term cohesion refers to this _____.

1ogical cohesion

142. Ethical issues are related to:

Moral principles

143. Modules come in a variety of_____.

Forms

144. _____begins the paragraph with a large letter that spills down into the text:

Drop cap

145. Plagiarism is a major problem in:

Education

146. Shortcut key of cut is:

Ctrl+x

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147. Which intermodal coupling occurs when a module passes control of execution to another, as in a function call?

control coupling

148. Process of understanding what the characteristics of images means refers to:

Analysis

149. This _____view of the database is called a database model.

Conceptual

150. If we want to end a page at a specific point and move to the next page we can use:

Page end

151. 1A file's _____is normally stored as a separate file on the same mass storage device as the__ _____.

index , indexed file

152. Declarative paradigms system is design for

All of these

153. 1A_____is a pre-developed model for solving a recurring problem in software design.

design pattern

154. The conceptual shape or arrangement of data is known as

Data structure

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155. Which of the following language is related to functional paradigm?

Python

156. This conceptual view of the database is called a _____ model.

Database

157. Electronic Theft include

Cyber bullying

158. Control structure iterates a set of instructions based on the provided condition called

Loop

159. Shortcut key of paste is:

Ctrl+v

160. Which from the following is not a relational operator?

! =

161. We can highlight a text from group:

Font

162. Reports can be received at home through email because of advancement in:

Artificial intelligence

163. CAN-SPAM Act applies in:

US

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164. In particular, the chart that indicates the entire game is overseen by a function named _____

Controlgame

165. A translator which takes assembly language program as input & produce machine language code as output is known as:

Assembler

166. Which of the following is social issue?

All of given

167. A rapidly expanding subject that is closely associated with database technology is_____, which consists of techniques for discovering patterns in collections of data.

Data mining

168. 1Assignment statement is

=

169. The term _____refers to a collection of data that is multidimensional in the sense that internal links between its entries make the information accessible from a variety of perspectives.

Database

170. The statement z=x+y shows

The sum of X and Y be assigned to the variable Z

171. 1The Turing test result of program DOCTOR developed by Joseph Weizenbaum was:

Ambiguous

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172. A process which is used by the software industry to design, develop and test high quality software is known as:

Software life cycle

173. 1Shortcut key to select the whole text in a document

Ctrl+a

174. In the case of the incremental model these prototypes evolve into the complete, final system, a process known as_____.

Evolutionary prototyping

175. Microsoft office includes:

Word

176. Design ribbon can have:

Page border

177. The option of strike through is in group:

Particular machine

178. The field of artificial intelligence is being pursued along paths:

2

179. Design phase is followed by……

Implementation

180. The point at which all the steps in a transaction have been recorded in the log is called the_____.

commit point

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181. "Displaying Text in Two Columns" feature is in which tab of MS Word?

Page Layout

182. Command that can immediately go to a page or any marked location within your document:

Go to

183. Ctrl+y is used for:

Redo

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Virtual University	**CS101 Introduction to Computing** **FINAL TERM PAPERS** **SOLVED MCQS**	**Due Date:** **Feb.9 , 2011**

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FINALTERM EXAMINATION

Spring 2010 Final

CS101- Introduction to Computing (Session - 2)

Question No: 1 (Marks: 1) - Please choose one
Human are better than computers at:
► Efficiency ► Accuracy **► Pattern recognitio** ► None of the given choices

Question No: 2 (Marks: 1) - Please choose one
Cray-1 was first commercial _____ computer
► Super ► Mini ► Micro ► Personal

Question No: 3 (Marks: 1) - Please choose one
URL is a/an _____
► Device ► Component **► Address** ► Tool

Question No: 4 (Marks: 1) - Please choose one
Mainframe Computers are also called _____
► Enterprise Servers ► Personal Servers ► Enterprise Managers ► Window Servers

Question No: 5 (Marks: 1) - Please choose one
Which of the following is NOT a category of Mobile Computers?
► Laptop ► Palmtop **► Desktop** ► Wearable

Question No: 6 (Marks: 1) - Please choose one
Preliminary exploration of possible solutions, technologies, suppliers is called
► Viability **► Feasibility** ► Specification ► Integration

Question No: 7 (Marks: 1) - Please choose one
_____ give us the ability to manipulate data through reference instead of actual value.
► Constants **► Variables** ► Data Types ► Operators

Question No: 8 (Marks: 1) - Please choose one
Consider the following statement written in JavaScript:
str = ”Hello” + ” World”
What will be the value of str ?
► HelloWorld ► Hello World ► Hello + World ► It will result in error

Question No: 9 (Marks: 1) - Please choose one

A tool that helps you to find the synonyms is called _____.

► Language ► Paragraph **► Thesaurus** ► Symbol

Question No: 10 (Marks: 1) - Please choose one

Communication protocol is a _____that governs the flow of information over a network

► Set of protocols **► Set of rules** ► Device ► Set of methods

Question No: 11 (Marks: 1) - Please choose one

If a computer could pass the Turing test then it would be able to:

► think like human beings

► do the things faster

► win a million dollar prize

► store more information

Question No: 12 (Marks: 1) - Please choose one

The first Web browser with a GUI was generally available in:

► 1992 **► 1993** ► 1994 ► 1995

Question No: 13 (Marks: 1) - Please choose one

Web is a unique invention by humans in terms that it is:

► accessible to only the owners who control it

► accessible from particular locations only

► accessible to all humans

► accessible to only the educational institutes

Question No: 14 (Marks: 1) - Please choose one

In this URL http://www.msn.com , _____identifies the domain name

► http ► www **► msn** ► com

Question No: 15 (Marks: 1) - Please choose one

_____ is simply a fast port that lets you connect computer peripherals and consumer electronics to your computer without restart.

► Freeware ► Shareware **► Firewire** ► Firmware

Question No: 16 (Marks: 1) - Please choose one

Which of the following is NOT supported by PC's power supply.

► -12 and +12 V DC **► -10 and +10 V DC** ► -5 and + 5 V DC ► All are supported

Question No: 17 (Marks: 1) - Please choose one

In which case Cache Memory is used

► To increase RAM speed

► To overcome BUS speed

► To overcome Speed rate between RAM and CPU

► To overcome CPU speed

Question No: 18 (Marks: 1) - Please choose one

To display a single line text area on the web page, we use ___ tag

► TEXT ► TEXTBOX ► **INPUT** ► INPUTBOX

Question No: 19 (Marks: 1) - Please choose one
If an algorithm is syntactically correct, but semantically incorrect then this situation is
► Very good situation
► **Very dangerous situation**
► Not very bad
► Neutral situation

Question No: 20 (Marks: 1) - Please choose one
Users communicate with the computer using a consistent user interface provided by the OS.
► **True** ► False

Question No: 21 (Marks: 1) - Please choose one
Application developers do not need to know much about the HW, especially the microProcessor, while they are developing their application.
► **True** ► False

Question No: 22 (Marks: 1) - Please choose one
The first spread sheet program was invented by
► Charles Babbage ► **Dan Bricklin** ► Paul Graham ► John von Neumann

Question No: 23 (Marks: 1) - Please choose one
Which representation technique of algorithm is more suitable for developer to make actual code_____.
► **pseudo code** ► flow chart ► both pseudo code and flow chart ► Heuristics

Question No: 24 (Marks: 1) - Please choose one
_____ is used to terminate all JavaScript statements.
► Colon ► **Semicolon** ► Underscore ► Apostrophe

Question No: 25 (Marks: 1) - Please choose one
In java script cookies can be created for future use_____.
► Easily
► No facility at all
► This is not possible without Java language.
► **Cookies are files so java script can not handle it.**

Question No: 26 (Marks: 1) - Please choose one
When the microprocessor desires to look at a piece of data, it checks in the _____ first.
► RAM ► ROM ► hard disk ► **cache**

Question No: 1 (Marks: 1) - Please choose one
Using Java Script you can write a character at random location on screen
► By applying randomCh() method
► With the help of String object
► With the help of random character property
► There is no built in approach in Java Script

Question No: 2 (Marks: 1) - Please choose one
If incorrectly we enter the negative age it is check by
► **Limit Integrity** ► Type Integrity ► Referential Integrity ► Physical Integrity

Question No: 3 (Marks: 1) - Please choose one
The Encryption of data is related to
► Data updates ► **Data security** ► Data integrity ► Data accessibility

Question No: 4 (Marks: 1) - Please choose one
Which protocol is use to transfer a file over the network ?
► UDP ► **FTP** ► TCP ► OSI

Question No: 5 (Marks: 1) - Please choose one
One can send an email message to a remote computer using _____ protocol
► HTTP ► **SMTP** ► FTP ► TELNET

Question No: 6 (Marks: 1) - Please choose one
In a System having many parts to be designed, one should always do the _____ first
► **Hard part** ► Simple part ► Development part ► Quality part

Question No: 7 (Marks: 1) - Please choose one
Flow control constructs in JavaScript includes:
► If-Else ► Loops and If -Else ► **Switch and If-Else** ► All of the given choices

Question No: 8 (Marks: 1) - Please choose one
___ provides a simple, consistent way for applications to interact with the HW without having to know all the details of the HW
► Explorer.exe ► **System Files** ► Operating System Application Software

Question No: 9 (Marks: 1) - Please choose one
Machine language is also called
► Assembly Language ► **Binary Language** ► High Level Language ► HTML Language

Question No: 10 (Marks: 1) - Please choose one
_____ is the best known builder for supercomputers.
► Sun ► **Cray Research** ► Microsoft ► Apple

Question No: 11 (Marks: 1) - Please choose one
The weaknesses of the computer are:
► Pattern recognition & Storage
► Speed & Innovative ideas
► **Pattern recognition & Innovative ideas**
► Speed & Storage

Question No: 12 (Marks: 1) - Please choose one
Communication protocol is a _____that governs the flow of information over a network
► Set of methods ► Set of protocols ► **Set of rules** ► Device

Question No: 13 (Marks: 1) - Please choose one
_____ team is responsible for the maintenance, expansion , improvement of the infrastructure consisting of workstations, networking equipment, software and network security.
► Support ► Configuration Management ► Quality Assurance ► **Developer**

Question No: 14 (Marks: 1) - Please choose one
_____ team consists on the sharpest technical minds in the company.
► **Architecture** ► Business Development ► Configuration Management ► Developer

Question No: 15 (Marks: 1) - Please choose one
_____ is responsible for day to day operations.
► CEO ► **COO** ► CMSO ► Developer

Question No: 16 (Marks: 1) - Please choose one
One of the key responsibilities of the _____ is client relationship management.
► **Project Manager** ► Team Lead ► Developer ► Quality Assurance Engineer

Question No: 17 (Marks: 1) - Please choose one
What is the major problem with flash based website?
► **Its two heavy** ► Cannot be indexed ► Less attractive ► Inaccessible

Question No: 18 (Marks: 1) - Please choose one
Which of the following is NOT an event handler for image object?
► onAbort ► onError ► onLoad ► onUser

Question No: 19 (Marks: 1) - Please choose one
The organizations are learning that business can be done in a more effective manner if emphasis is placed upon _____.
► Cooperation ► **Shared responsibility** ► Networking ► All of the given options

Question No: 1 (Marks: 1) - Please choose one
_____
It represents the _____ flow chart element.

► Flow Line ► Connector ► Off-page connector ► **Start or Stop**

Question No: 2 (Marks: 1) - Please choose one

What is NOT a key factor while designing a website?

► Usability ► User-friendly ► Consistency ► **Complexity**

Question No: 3 (Marks: 1) - Please choose one

_____% of the users have left websites in frustration due to poor navigation.

► 40 ► 62 ► **83** ► 91

Question No: 4 (Marks: 1) - Please choose one

In JavaScript, a variable declaration is

► **Optional** ► Mandatory ► Not allowed ► None of the given

Question No: 5 (Marks: 1) - Please choose one

A protocol used for receiving email messages is called _____.

► URL ► Telnet ► **POP3** ► SMTP

Question No: 6 (Marks: 1) - Please choose one

Which is correct?

► **onUnload** ► onUnLoad ► onUNLOAD ► All of the above

Question No: 7 (Marks: 1) - Please choose one

Serial arrangement in which things follow logical order or a recurrent pattern, such as statements executing one by one, is called _____.

► **Loop** ► Sequence ► Condition ► Array

Question No: 8 (Marks: 1) - Please choose one

Variables allow us to manipulate data through the _____.

► Actual Value ► **Reference** ► Length ► Name

Question No: 9 (Marks: 1) - Please choose one

Fuzzy logic is based on _____.

► Ground facts ► Experience ► Practice ► **Approximation**

Question No: 10 (Marks: 1) - Please choose one

Word Processor is a

_____

► System Software ► **Application Software** ► Device ► Utility

Question No: 11 (Marks: 1) - Please choose one

_____ In the old days, databases did NOT support _____.

► Number ► Boolean ► **Video** ► Text

Question No: 12 (Marks: 1) - Please choose one

_____ In tabular storage, fields placed in a particular row are strongly _____.

► Independent ► Dependent ► **Interrelated** ► Inconsistent

Question No: 13 (Marks: 1) - Please choose one

_____ Due to working at home, lack of interaction may result in _____ professional growth.

► **Slower** ► Faster ► Higher ► Improved

Question No: 14 (Marks: 1) - Please choose one

_____ Distance learning has got a boost due to the _____.

► Easy communication ► Online interactive contents ► Flexibility

► **All of the given options**

Question No: 15 (Marks: 1) - Please choose one

_____ _____ technique can be used to create smooth animations or to display one of several images based on the requirement.

► Image downloading ► **Image preloading** ► Image uploading

► Image postloading

Question No: 16 (Marks: 1) - Please choose one

_____ The _____ is becoming the preferred organizational structure for more and more organizations with the passage of time.

► Tree structured organizational model

► **Network paradigm** ► Hierarchical structure ► None of the given options

Question No: 17 (Marks: 1) - Please choose one

_____ The group of technologies concerned with the capturing, processing and transmission of information in the digital electronic form is called _____.

► Telecom Engineering

► Computer Engineering

► Computer Science

► **Information Technology**

Question No: 18 (Marks: 1) - Please choose one

A large number of networks interconnected physically are called _____

► **LAN** ► MAN ► Internet ► Network collection

Question No: 19 (Marks: 1) - Please choose one

TCP stands for _____.

► Transfer Center protocol ► **Transmission Control Protocol**
► Transmission Center Protocol ► Telephone Center Protocol

Question No: 20 (Marks: 1) - Please choose one

A collection of data organized in such a way that the computer can quickly search for a desired data item is known as:

► Retrieving ► **Database** ► Information ► DBMS

Question No: 21 (Marks: 1) - Please choose one

_____ is simply a fast port that lets you connect computer peripherals and consumer electronics to your computer without restart.

► Freeware ► Shareware ► **Firewire** ► Firmware

Question No: 22 (Marks: 1) - Please choose one

Structures, in which another list starts before the first list is finished, are called:

► Multiple Lists ► **Nested Lists** ► Ordered Lists ► Un-ordered Lists

Question No: 23 (Marks: 1) - Please choose one

The key property of the 'Array' object in JavaScript is

► Value ► **Length** ► Name ► All of the given choices

Question No: 24 (Marks: 1) - Please choose one

Which one is the example of spreadsheet software?

► MS Word ► MS PowerPoint ► **MS Excel** ► MS Access

Question No: 25 (Marks: 1) - Please choose one

The Encryption of data is related to

► Data updates ► **Data security** ► Data integrity ► Data accessibility

Question No: 26 (Marks: 1) - Please choose one

_____ is the process of analyzing large databases to identify patterns.

► Data normalization ► Data management ► **Data Mining** ► None of the given options

Question No: 27 (Marks: 1) - Please choose one

Which is the user-friendly way of presenting data?

► Query ► Form **► Report** ► All of the given options

Question No: 28 (Marks: 1) - Please choose one

JavaScript function fixed () has equivalent HTML tag-set ____

► <.FIX>……</FIX> ► <F>……..</F>

► <PRE>…… </PRE> ► <H>……..</H>

Question No: 29 (Marks: 1) - Please choose one

<Form> Tags always placed between the <BODY> and </BODY> tags of a Web page

► True

► False

Question No: 30 (Marks: 1) - Please choose one

Java script has ------- ---------- ability to create and draw graphics.

► Limited ► Versatile ► Medium **► Not at all**

Final term paper

1-when actions depends upon the values of multiple variables we ll use -----?

1-if 2-else 3-if----else 4-none

2-when the exact number of iterations is known use the ----loop ?

1-for 2-if 3-while 4-none

3-when the number of iteration depend upon a condition being met use the ------ loop

1-for 2-switch 3-while 4-none

4-the key property of ''array ''object is ----------?

1-length 2-width 3-single 4-none

5-two of the key ''array ''methods are reverse ()-sort()

1-true 2-false

6-javascript array are -------?
1-multiple 2-herterogenous 3-homogenous 4-none

7------multiple computer that are connected together to share information and other resources
1-network 2-internets 3-compnetworks 4-none

8 – comp networks can send an email message to a remote comp using the ---- protocol?
1-HTTP 2-FTP 3-SMTP 4-none

9-comp network can browse documents residing on a remote comp using -------?
1-HTTP 2-FTP 3-SMTP 4-none

10-comp networks can download and upload files to a remote comp using ------?
1-HTTP 2-FTP 3-SMTP 4-none

11- network can run a program on remote comp using the ----------?
1-SMTP 2-TELNET 3-HTTP 4-none

12-components of convertional computer networks are except one ?
1-VPN 2-NIC 3-computers 4-hub

13-NIC stands for ----------?
1-national internet cables 2-national interface cards
3-network interface cards 4-none

14-cables are either----------?
1-electrical 2-digita l3-optical 4-1 and 2

15- hub component of comp network is ----------?
1-I/O device 2-traffic controller
3-network traffic controller 4-none

16- optical cables are required by wireless networks
1-true 2-false

17------ a deviece used to connect several computer to form a network

1-hub 2-cable 3-NIC 4-none

18- a hub has several -----?

1-NIC 2-cables 3-packet 4-ports

19- ------ smaller unit of data transmitted over a comp network

1-hub 2-port 3-packet 4-none

20- all packets travel----------?

1-dependently 2-independently 3-alternatively 4-none

Question No: 1 (Marks: 1) - Please choose one

---------- was known as "mill" in Analytical engine.

► Memory ► **Processor** ► Monitor ► Mouse

Question No: 2 (Marks: 1) - Please choose one

First electronic computer was

► ABC ► **UNVAC 1** ► Harvard Mark 1 ► IBM PC

Question No: 3 (Marks: 1) - Please choose one

What is NOT a key factor while designing a website?

► Usability ► User-friendly ► Consistency ► **Complexity**

Question No: 4 (Marks: 1) - Please choose one

What happens if I start a new list without closing the original one?

► An error will be generated ► **A nested list will be created**

► Previous list will end and a new will start. ► Nothing will happen

Question No: 5 (Marks: 1) - Please choose one

The most upper right pixel of the screen is of _____ color.

► **Any** ► Red ► Green ► Blue

Question No: 6 (Marks: 1) - Please choose one

A single pixel can acquire approximately _____ color schemes.

► 1 million ► 2 million ► 10 million ► **16 million**

Question No: 7 (Marks: 1) - Please choose one

The idea of Neural Networks field is based upon _____.

► Human nature ► **Human brain** ► Human culture ► Human actions

Question No: 8 (Marks: 1) - Please choose one
Which one of the following is an application for artificial intelligence?
► **Robotic** ► Web Agent ► Decision Support System ► All of the given options

Question No: 9 (Marks: 1) - Please choose one
Register is a kind of _____memory
► **Fast** ► Super fast ► Slow ► Very slow

Question No: 10 (Marks: 1) - Please choose one
Which of the following is a true statement?
► Flat-file storage is better than tabular storage.
► **Tabular storage is better than flat-file storage.**
► Flat-file storage is better than relational storage.
► None of the given options

Question No: 11 (Marks: 1) - Please choose one
substring(n, m) returns a string containing characters copied from position n to_____.
► m – 2 ► **m – 1** ► m + 1 ► m

Question No: 12 (Marks: 1) - Please choose one
The _____ is the old profession which is being eliminated because of computing.
► **Typist** ► Bank manager ► Operational manager ► All of the given options

Question No: 13 (Marks: 1) - Please choose one
The system that manages relational database, is called _____.
► None of the given options
► Database Management System
► Data Management System
► **Relational Database Management System**

Question No: 14 (Marks: 1) - Please choose one
When web server is busy it gives the following message to the user :
► Time out ► Waiting ► **Server busy** ► None of the given options

Question No: 15 (Marks: 1) - Please choose one
The group of technologies concerned with the capturing, processing and transmission of information in the digital electronic form is called _____.
► Telecom Engineering ► Computer Engineering
► Computer Science ► **Information Technology**

Question No: 16 (Marks: 1) - Please choose one
_____ team consists on the sharpest technical minds in the company.
► **Architecture** ► Business Development ► Configuration Management ► Developer

Question No: 17 (Marks: 1) - Please choose one
TCP stands for _____.
► Transfer Center protocol ► **Transmission Control Protocol**
► Transmission Center Protocol ► Telephone Center Protocol

Question No: 18 (Marks: 1) - Please choose one
A collection of data organized in such a way that the computer can quickly search for a desired data item is known as :
► Retrieving ► **Database** ► Information ► DBMS

Question No: 19 (Marks: 1) - Please choose one
Microsoft Word is a type of:
► System Software ► **Freeware Software** ► Shrink-Wrapped Software ► Custom-built Software

Question No: 20 (Marks: 1) - Please choose one
Users _____, how things work.
► Analyze in detail ► **Muddle through** ► Figure out ► Read in detail

Question No: 21 (Marks: 1) - Please choose one
Popular schemes used for reducing bytes for storage are:
► RGB and Color mapping ► RGB and Dithering
► RGB, Color mapping and Dithering ► **Color mapping and Dithering**

Question No: 22 (Marks: 1) - Please choose one
Hardware malfunctions is related to
► Data updates ► Data integrity ► Data security ► **Data accessibility**

Question No: 23 (Marks: 1) - Please choose one
If incorrectly we enter the negative age it is check by
► **Limit Integrity** ► Type Integrity ► Referential Integrity ► Physical Integrity

Question No: 24 (Marks: 1) - Please choose one
Which is the user-friendly way of presenting data ?
► Query ► Form ► **Report** ► All of the given options

Question No: 25 (Marks: 1) - Please choose one
Currently the BlueRay DVD can store more than _____ of data.
► 10 GB ► 100 GB ► **50 GB** ► 150 GB

Question No: 26 (Marks: 1) - Please choose one
In JavaScript, a || b is interpreted as

► a is true or b is false ► a is true and b is true
► a is false and b is true ► **a is true or b is true or both are true**

Question No: 27 (Marks: 1) - Please choose one

Speakers fall into the hardware category.
► True ► False

Question No: 28 (Marks: 1) - Please choose one
onBlur event is occurred for a form element when it _____

► Gets focus ► Losts focus ► Some thing is typed in ► onBlur is not an event

Question No: 29 (Marks: 1) - Please choose one
You can view a 3-D image on a _____.
► 3-D display ► 2-D display ► On both 2-D and 3-D displays ► We can not view a 3-D image

Question No: 30 (Marks: 1) - Please choose one
Module level design and unit testing is the responsibility of _____.
► Team Lead ► Developer ► Project Manager ► Quality Assurance Expert

FINALTERM EXAMINATION
CS101- Introduction to Computing (Session - 2)

Question No: 1 (Marks: 1) - Please choose one
What is NOT a key factor while designing a website?
► Usability ► User-friendly ► Consistency ► Complexity

Question No: 2 (Marks: 1) - Please choose one
Communications on the internet is controlled by a set of two protocols which are _____.
► IMAP and SMTP ► FTP and HTTP ► TCP and IP ► TCP and HTTP

Question No: 3 (Marks: 1) - Please choose one
A variable can be _____ in scope.
► Local ► Global ► Either local or global
► None of the given options

Question No: 4 (Marks: 1) - Please choose one
A protocol used for receiving email messages is called _____.
► URL ► Telnet ► POP3 ► SMTP

Question No: 5 (Marks: 1) - Please choose one
Aliasing problem can be managed by _____the size of pixels.
► Reducing ► Increasing ► Gaining ► Modifying

Question No: 6 (Marks: 1) - Please choose one
Serial arrangement in which things follow logical order or a recurrent pattern, such as statements executing one by one, is called _____.
► Loop ► Sequence ► Condition ► Array

Question No: 7 (Marks: 1) - Please choose one
Which of the following data types are recognized by JavaScript?
► Strings ► Numbers ► Undefined **► All of the given options**

Question No: 8 (Marks: 1) - Please choose one
a = Math.ceil(12.01)
What will be the value of a ?
► 12 **► 13** ► 12.0 ► 13.01

Question No: 9 (Marks: 1) - Please choose one
In the old days, databases did NOT support _____.
► Number ► Boolean **► Video** ► Text

Question No: 10 (Marks: 1) - Please choose one
The organizations are learning that business can be done in a more effective manner if emphasis is placed upon _____.
► Cooperation ► Shared responsibility ► Networking
► All of the given options

Question No: 11 (Marks: 1) - Please choose one
Module level design is the responsibility of the _____.
► Architect ► Team Lead **► Developer** ► CEO

Question No: 12 (Marks: 1) - Please choose one
_____ errors are caused by the code that somehow violates the rule of the language.
► Syntax ► Semantic ► Run time ► Load time

Question No: 13 (Marks: 1) - Please choose one
The world first computer program was written to compute:
► Simple sequence ► Multiple sequence
► Bernoulli's sequence ► Increasing sequence

Question No: 14 (Marks: 1) - Please choose one
Microsoft Word is a type of:
► System Software ► Freeware Software
► Shrink-Wrapped Software ► Custom-built Software

Question No: 15 (Marks: 1) - Please choose one
We need _____ for memory management in computer
► Software ► Hardware **► Operating System**
► Application Software

Question No: 16 (Marks: 1) - Please choose one
_____ is generally measured in terms of the number of steps required to execute an

algorithm.

► Space ► **Time** ► Memory and time ► Bandwidth

Question No: 17 (Marks: 1) - Please choose one

PowerBuilder falls in the category of _____.

► Assembly Languages ► **4-th Generation Languages**

► Machine Languages ► High-Level Languages

Question No: 18 (Marks: 1) - Please choose one

_____ means to break down into simpler components and analyze.

► Recursion ► **Parsing** ► Scope ► Navigation

Question No: 19 (Marks: 1) - Please choose one

```
for(var i=1; i<=2;i=i+1)
{
document.write( "Sorted Words:" + "<BR>" )
}
```

Which of the following shall be the output of above code:

►Sorted Words: Sorted Words: ►Sorted Words:Sorted Words:

►Sorted Words: “
” Sorted Words: “
”

**► Sorted Words:
 Sorted Words:
 (correct)**

Question No: 20 (Marks: 1) - Please choose one

Assembly languages allow a programmer to use _____ for numbers.

► Object ► Entity ► **Name** ► Interpreter

Question No: 21 (Marks: 1) - Please choose one

_____ means you have only one container to store more than one value in JavaScript.

► Variable ► Matrix ► **Array** ► String

Question No: 22 (Marks: 1) - Please choose one

Coding is the responsibility of _____

► Software design ► **Software developer** ► Project manager

► None of given

Question No: 23 (Marks: 1) - Please choose one

CEO stands for_____

► Central Executive officer ► Chief External officer

► **Chief executive officer** ► None of given

Question No: 24 (Marks: 1) - Please choose one

Decision Support Systems will become a bigger part of the professional life of the_____ .

► Doctors ► Mangers ► Marketers ► **All of above**

Question No: 25 (Marks: 1) - Please choose one

The output of fuzzy Logic System is computed by using _____Technique.

► MAX-MAX ► MAX-MIN **► MIN-MAX** ► None of the given

Question No: 26 (Marks: 1) - Please choose one

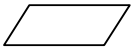
In the statement Math.PI, Math is _____ and PI is _____.

► Variable, Constant ► Object , Method

► Object , Function **► Object, Property**

FINALTERM EXAMINATION
CS101- Introduction to Computing (Session - 2)

Question No: 1 (Marks: 1) - Please choose one



It represents the _____ flow chart element.

► Process **► Input or Output** ► Decision ► Connector

Question No: 2 (Marks: 1) - Please choose one

Website design should NOT be _____.

► Unified **► Complex** ► Consistent ► Predictable

Question No: 3 (Marks: 1) - Please choose one

The most upper right pixel of the screen is of _____ color.

► Any ► Red ► Green ► Blue

Question No: 4 (Marks: 1) - Please choose one

Which of the following is NOT an example of Multi-user Operating system

► Windows ► Linux **► DOS** ► Solaris

Question No: 5 (Marks: 1) - Please choose one

According to the heuristic, the number of defects remaining in a system after a given level of tests is proportional to _____.

► The number found on very first day.

► The number found during the development.

► The number found during the test.

► None of the given options.

Question No: 6 (Marks: 1) - Please choose one
Which one of the following is NOT a component of Rule Based System?
► **Rule Compiler** ► Rule Interpreter ► Rules Base ► Working Memory

Question No: 7 (Marks: 1) - Please choose one
In RDBMS, table rows are called _____.
► Field ► **Record** ► Column ► Query

Question No: 8 (Marks: 1) - Please choose one
_____ can be used for entering, editing, or viewing data, one record at a time.
► Queries ► **Forms** ► Reports ► None of the given options

Question No: 9 (Marks: 1) - Please choose one
Tribal flood network is a _____ software.
► **DoS** ► Scanning ► Utility ► None of the given options

Question No: 10 (Marks: 1) - Please choose one
Unlike virus, _____ is a stand-alone program.
► **Trojan horse** ► Logic bomb ► Worm ► Time bomb

Question No: 11 (Marks: 1) - Please choose one
The key responsibilities of a project manager is _____.
► Planning and tracking of the project
► Arranging of the appropriate resources
► Client relationship management
► **All of the given options**

Question No: 12 (Marks: 1) - Please choose one
The key responsibilities of the architect of the project is_____.
► Technology selection
► High-level design
► Makes certain that the implementation remains true to the design
► **All of the given options**

Question No: 13 (Marks: 1) - Please choose one
_____ is responsible for day to day operations.
► CEO ► **COO** ► CMSO ► Developer

Question No: 14 (Marks: 1) - Please choose one
onAbort , onError are the _____ of the image object.
► **Event Handler** ► Properties ► Methods
► None of the given options

Question No: 15 (Marks: 1) - Please choose one
The tasks performed to detect the exact location of defect is called_____

► **Debugging** ► Testing ► Repairing ► Monitoring

Question No: 16 (Marks: 1) - Please choose one
_____ routes the packets through the internet to go to their destination.
► Protocol ► TCP ► **IP** ► NIC

Question No: 17 (Marks: 1) - Please choose one
When we buy a software package, we do not really buy it, we just by a license that allows us to use it, the _____stays with the maker.
► Agreement ► **Ownership** ► Membership ► Software

Question No: 18 (Marks: 1) - Please choose one
Sequence of steps that is taken to solve a problem is called _____.
► **Algorithm** ► Operating System ► Application software
► None of the given options

Question No: 19 (Marks: 1) - Please choose one
A collection of data organized in such a way that the computer can quickly search for a desired data item is known as :
► Retrieving ► **Database** ► Information ► DBMS

Question No: 20 (Marks: 1) - Please choose one
To start an ordered list from 20 instead of 1, we will write
► <OL begin = “20"> ► <OL initiate = “20">
► **<OL start = “20">** ► <OL from = “20">

Question No: 21 (Marks: 1) - Please choose one
_____ are personal computers that are designed to be easily transported and relocated.
► Desktops ► **Portables** ► Servers ► Workstations

Question No: 22 (Marks: 1) - Please choose one
To display a multi-line text area on the web page, we use ___ tag
► TEXT ► **TEXTAREA** ► INPUT ► INPUTAREA

Question No: 23 (Marks: 1) - Please choose one
The first component of an operating system that runs when a typical computer is turned ON, is:
► Device Manager ► File Manager ► **Loader** ► Device Driver

Question No: 24 (Marks: 1) - Please choose one
Pseudo code is written in
► **Complex grammar** ► Plain English ► JAVA ► Pseudo language

Question No: 25 (Marks: 1) - Please choose one
Instead of Full System, one can _____ results from part of a System
► **Not achieve** ► Mostly achieve ► Sometimes achieve ► Achieve

Question No: 26 (Marks: 1) - Please choose one
One can download or upload files to a remote computer using _____ protocol.
► HTTP ► SMTP **► FTP** ► TELNET

Question No: 27 (Marks: 1) - Please choose one
Which protocol is used to control other computer from our own computer ?
► FTP ► NNTP **► TELNET** ► None of the given choices

Question No: 28 (Marks: 1) - Please choose one
Which function returns a randomly selected floating point number between 0 and 1 ?
► floor(x) ► ceil(x) **► random()** ► round(x)

Question No: 29 (Marks: 1) - Please choose one
Global variables can make the logic of a web page.
► Difficult to understand
► Easier to understand and maintain
► Difficult to reuse and maintain
► Difficult to understand, reuse and maintain

Question No: 30 (Marks: 1) - Please choose one
Mathematical functions in JavaScript, are accessed by referring to various methods of the _____ object.
► Math ► Calculate ► Compute ► None of the given options

FINALTERM EXAMINATION
CS101- Introduction to Computing (Session - 2)

Question No: 1 (Marks: 1) - Please choose one
Human are better than computers at:
► Efficiency ► Accuracy **► Pattern recognition** ► None of the given choices

Question No: 2 (Marks: 1) - Please choose one
TCP stands for _____.
► Total communication protocol **► Transmission control protocol**
► Transfer control protocol ► Transfer collection protocol

Question No: 3 (Marks: 1) - Please choose one
First computer network was _____.
► NSFNET ► FIRSTNET **► ARPANET** ► ORPHANET

Question No: 4 (Marks: 1) - Please choose one
A user may access any item on the web through _____.
► URL ► Telnet ► POP ► SMTP

Question No: 5 (Marks: 1) - Please choose one
In JavaScript, a variable declaration is
► **Optional** ► Mandatory ► Not allowed ► None of the given

Question No: 6 (Marks: 1) - Please choose one
According to a popular heuristic, success is defined by _____.
► **The user** ► The builder ► Both user and builder
► None of the given options

Question No: 7 (Marks: 1) - Please choose one
To store rounded number of 8.6 in a variable called "r_number", we write _____.
► r_numbers=Maths.rounds(8.6) ► r_number=Math.rounds(8.6)
► **r_number=Math.round(8.6)** ► r_number=Maths.round(8.6)

Question No: 8 (Marks: 1) - Please choose one
random() function returns a randomly-selected, floating-point number between _____.
► **0 and 1** ► 0 and 10 ► 0 and -10 ► 0 and -1

Question No: 9 (Marks: 1) - Please choose one
Trinoo is a _____ software.
► **DoS** ► Scanning ► Utility ► None of the given options

Question No: 10 (Marks: 1) - Please choose one
Which attribute of the IMG tag tells us about the source of the image _____.
► source ► path ► loc ► **src**

Question No: 11 (Marks: 1) - Please choose one
The developer report to _____ in a development team.
► **Team Lead** ► Project Manager ► CEO ► IT Manager

Question No: 12 (Marks: 1) - Please choose one
The effective way not to only write programs but also it works properly and further more to minimize the time and the development cost of the program is called_____
► Programming Mechanism ► **Programming Methodology**
► Programming Synchronization ► None of the given options

Question No: 13 (Marks: 1) - Please choose one
TCP stands for _____.
► Transfer Center protocol ► **Transmission Control Protocol**
► Transmission Center Protocol ► Telephone Center Protocol

Question No: 14 (Marks: 1) - Please choose one
When we buy a software package, we do not really buy it, we just by a license that allows us to use it, the _____stays with the maker.
► Agreement ► **Ownership** ► Membership ► Software

Question No: 15 (Marks: 1) - Please choose one
Many developers write the _____ first and then incrementally convert each line into _____.
► Real code & Pseudo code ► **Pseudo code & Real code**
► Real code & Artificial code ► None of the given options

Question No: 16 (Marks: 1) - Please choose one
Collection of facts & figures is called _____.
► **Information** ► Data ► Entity ► Attribute

Question No: 17 (Marks: 1) - Please choose one
A collection of data organized in such a way that the computer can quickly search for a desired data item is known as :
► Retrieving ► **Database** ► Information ► DBMS

Question No: 18 (Marks: 1) - Please choose one
To start an ordered list from 20 instead of 1, we will write
► <OL begin = “20"> ► <OL initiate = “20">
► **<OL start = “20">** ► <OL from = “20">

Question No: 19 (Marks: 1) - Please choose one
Using COLSPAN, number of rows of the current cell should extend itself
► Upward ► **Downward**
► Both Upward and Downward ► None of the given choices

Question No: 20 (Marks: 1) - Please choose one
Microsoft Word is a type of:
► System Software ► **Freeware Software**
► Shrink-Wrapped Software ► Custom-built Software

Question No: 21 (Marks: 1) - Please choose one
Compound Statement after decision constructs in JavaScript is enclosed with
► ( ) ► [ ] ► { }; ► **{ }**

Question No: 22 (Marks: 1) - Please choose one
Users _____, how things work.
► Analyze in detail ► **Muddle through** ► Figure out ► Read in detail

Question No: 23 (Marks: 1) - Please choose one
One can send an email message to a remote computer using _____ protocol
► HTTP ► **SMTP** ► FTP ► TELNET

Question No: 24 (Marks: 1) - Please choose one
Writing a response, multiple statements are separated from each other with the help of
► **Period (.)** ► Comma (,) ► Colon (:) ► Semicolon (;)

Question No: 25 (Marks: 1) - Please choose one
With the passage of time the field of Computing and Telecommunication is _____.
► Diverging **► Converging** ► Becoming different ► Becoming unique

Question No: 26 (Marks: 1) - Please choose one
When we have to show value as part of a whole picture, which type of chart is used.
► Bar chart ► Pie chart ► Line graph **► None of the given**

Question No: 27 (Marks: 1) - Please choose one
_____ software directly interacts with the user.
► Application software ► System software
► Anonymous software ► Interactive software

Question No: 28 (Marks: 1) - Please choose one
Global variables can make the logic of a web page.
► Difficult to understand ► Easier to understand and maintain
► Difficult to reuse and maintain ► Difficult to understand, reuse and maintain

Question No: 29 (Marks: 1) - Please choose one
In partitioning of program/module, it should be assured that partitioned chunks should be as _____ as possible.
► Dependent **► Independent** ► Complex ► All of the above

FINALTERM EXAMINATION
CS101- Introduction to Computing (Session - 2)

Question No: 1 (Marks: 1) - Please choose one
The memory size of the Altair 8800 was
► 128 bytes ► 128 Kilo bytes ► 256 Kilo bytes **► 256 bytes**

Question No: 2 (Marks: 1) - Please choose one
A named collection of properties (data, state) and methods (instruction, behavior) is called _____.
► Array ► Function ► Variable **► Object**

Question No: 3 (Marks: 1) - Please choose one
JavaScript Variables are _____.
► Dynamically Typed ► Statically Typed ► Strong Typed
► None of the given options

Question No: 4 (Marks: 1) - Please choose one
Serial arrangement in which things follow logical order or a recurrent pattern, such as statements executing one by one, is called _____.

► Loop ► Sequence ► Condition **► Array**

Question No: 5 (Marks: 1) - Please choose one
Rule of thumb learned through trial and error is called _____.
► Design **► Heuristic** ► Plan ► Aim

Question No: 6 (Marks: 1) - Please choose one
According to heuristic, if you can't explain it in _____ minutes, either you don't understand it or it does not work.
► 10 ► 2 **► 5** ► 4

Question No: 7 (Marks: 1) - Please choose one
To store rounded number of 8.6 in a variable called "r_number", we write _____.
► r_numbers=Maths.rounds(8.6) ► r_number=Math.rounds(8.6)
► r_number=Math.round(8.6) ► r_number=Maths.round(8.6)

Question No: 8 (Marks: 1) - Please choose one
Using only HTML we can create
► Dynamic web pages **► Static web pages**
► Both Static and Dynamic pages ► None of these

Question No: 9 (Marks: 1) - Please choose one
_____ function returns the largest integer that is less than or equal to x.
► round(x) ► floor ► ceil ► abs(x)

Question No: 10 (Marks: 1) - Please choose one
Due to working at home, contact with the colleagues is _____, which may result in _____ quality of work
► Reduced, Poorer ► Reduced, Better ► Increased, Poorer **► Increased, Better**

Question No: 11 (Marks: 1) - Please choose one
The distance among families is _____ because of spending more time on internet.
► Increased ► Expanded ► Contracted ► Decreased

Question No: 12 (Marks: 1) - Please choose one
When web server is busy it gives the following message to the user :
► Time out ► Waiting **► Server busy** ► None of the given options

Question No: 13 (Marks: 1) - Please choose one
_____ is designed for detecting viruses and inoculating.
► Antivirus ► Utility ► Trojan ► None of the given choices

Question No: 14 (Marks: 1) - Please choose one
The _____ is becoming the preferred organizational structure for more and more organizations with the passage of time.

► Tree structured organizational model ► **Network paradigm**
► Hierarchical structure ► None of the given options

Question No: 15 (Marks: 1) - Please choose one
Planning and tracking of the project is the responsibility of the_____.
► **Project Manager** ► Architect ► Developer ► Chief Executive Officer

Question No: 16 (Marks: 1) - Please choose one
The responsibilities of the Team Lead includes_____.
► **Planning and tracking of the project**
► Detailed design
► Professional development of team members
► All of the given options

Question No: 17 (Marks: 1) - Please choose one
_____ team is responsible for a project after the specification's stage till the very end.
► Executive ► Architect ► **Development** ► HR

Question No: 18 (Marks: 1) - Please choose one
There are _____ types of errors.
► 2 ► **3** ► 4 ► 5

Question No: 19 (Marks: 1) - Please choose one
_____ are the computers that perform at or near the currently highest operational rate for computers.
► Minicomputers ► Microcomputers ► **Supercomputers** ► Personal Computers

Question No: 20 (Marks: 1) - Please choose one
Which one of these is NOT an example of storage devices?
► Tape ► **RAM** ► Floppy ► DVD

Question No: 21 (Marks: 1) - Please choose one
Forms can be submitted by using _____ different methods
► **2** ► 3 ► 4 ► 5

Question No: 22 (Marks: 1) - Please choose one
Which is NOT true for JavaScript variable name ?
► Student ► Roll_no_1111 ► For ► **schedule**

Question No: 23 (Marks: 1) - Please choose one
One can browse documents residing on a remote computer using _____ protocol.
► **HTTP** ► SMTP ► FTP ► TELNET

Question No: 24 (Marks: 1) - Please choose one
Which one is the example of spreadsheet software ?
► MS Word ► MS PowerPoint ► **MS Excel** ► MS Access

Question No: 25 (Marks: 1) - Please choose one
User can remotely log on to a computer and can have a control over it like a local user using
► TelNet Protocol
► **TelNet Protocol and connected to the user through TCP/IP network**
► TelNet protocol and FTP ► TCP/IP and FTP

Question No: 26 (Marks: 1) - Please choose one
Hardware malfunctions is related to
► Data updates ► Data integrity ► Data security ► **Data accessibility**

Question No: 27 (Marks: 1) - Please choose one
PowerBuilder falls in the category of _____.
► Assembly Languages ► 4-th Generation Languages
► Machine Languages ► **High-Level Languages**

Question No: 28 (Marks: 1) - Please choose one
Backbone is also called as _____.
► **vBNS** ► BNS ► vHBNS ► HBNS

Question No: 29 (Marks: 1) - Please choose one
Global variables can make the logic of a web page.
► **Difficult to understand** ► Easier to understand and maintain
► Difficult to reuse and maintain ► Difficult to understand, reuse and maintain

Question No: 30 (Marks: 1) - Please choose one
In JavaScript: In order to display the text on browser **Grade A**, which of following statement is True.
► documentwrite("Grade A") ► **document.write("Grade A");**
► document.write("Grade" && A"); ► document.write("Grade" && "A");

FINALTERM EXAMINATION
CS101- Introduction to Computing (Session - 3)

Question No: 1 (Marks: 1) - Please choose one
First computer network was _____.
► NSFNET ► FIRSTNET ► **ARPANET** ► ORPHANET

Question No: 2 (Marks: 1) - Please choose one
In a good presentation each slide should contain_____.

► **Heading** ► Phrases not sentences ► Sentences not phrases ► Heading, sentences not phrases

Question No: 3 (Marks: 1) - Please choose one

A function is also called _____.

► Sub-program ► Procedure ► Sub-routine **► All of the given option**

Question No: 4 (Marks: 1) - Please choose one

A single pixel can acquire approximately _____ color schemes.

► 1 million ► 2 million ► 10 million **► 16 million**

Question No: 5 (Marks: 1) - Please choose one

Which of the following is NOT a Loop statement?

► For ► While **► Switch** ► Do-While

Question No: 6 (Marks: 1) - Please choose one

Which one of the following is NOT a component of Rule Based System?

► Rule Compiler ► Rule Interpreter ► Rules Base ► Working Memory

Question No: 7 (Marks: 1) - Please choose one

Spread sheet is a type of _____.

► **Productivity software** ► Engineering software ► Mathematical software ► Business software

Question No: 8 (Marks: 1) - Please choose one

A combination of word processing and graphic design is

► Corel Draw **► Desktop Publishing** ► Paint ► WordPad

Question No: 9 (Marks: 1) - Please choose one

To store rounded number of 8.6 in a variable called "r_number", we write _____.

► r_numbers=Maths.rounds(8.6) ► r_number=Math.rounds(8.6)

► r_number=Math.round(8.6) ► r_number=Maths.round(8.6)

Question No: 10 (Marks: 1) - Please choose one

Which of the following is a true statement?

► Flat-file storage is better than tabular storage.

► Tabular storage is better than flat-file storage.

► Flat-file storage is better than relational storage.

► None of the given options

Question No: 11 (Marks: 1) - Please choose one

The political process is also influenced by the use of _____.

► Discussion forums ► Newsgroups ► Mailing lists

► All of the given options

Question No: 12 (Marks: 1) - Please choose one

The system that manages relational database, is called _____.

► **None of the given options**

► Database Management System

► Data Management System

► Relational Database Management System

Question No: 13 (Marks: 1) - Please choose one

_____ DBMS supports data in terabytes.

► Personal ► Desktop ► **Enterprise** ► Single-user

Question No: 14 (Marks: 1) - Please choose one

Trinoo is a _____ software.

► **DoS** ► Scanning ► Utility ► None of the given options

Question No: 15 (Marks: 1) - Please choose one

What is the major problem with flash based website?

► **Its two heavy** ► Cannot be indexed ► Less attractive ► Inaccessible

Question No: 16 (Marks: 1) - Please choose one

The organization is the collection of _____.

► **Peoples** ► Professionals ► Teams ► Individuals

Question No: 17 (Marks: 1) - Please choose one

The tasks performed to determine the existence of defects is called _____

► Debugging ► **Testing** ► Repairing ► Coding

Question No: 18 (Marks: 1) - Please choose one

Many developers write the _____ first and then incrementally convert each line into _____.

► Real code & Pseudo code ► **Pseudo code & Real code**

► Real code & Artificial code ► None of the given options

Question No: 19 (Marks: 1) - Please choose one

Forms can be submitted through _____ & _____ methods

► INCLUDE, POST ► INCLUDE, GET

► **GET, POST** ► SEND, POST

Question No: 20 (Marks: 1) - Please choose one

If an algorithm is syntactically correct, but semantically incorrect then this situation is

► Very good situation ► **Very dangerous situation**

► Not very bad ► Neutral situation

Question No: 21 (Marks: 1) - Please choose one

Heuristics _____ lead to the best results.

► Sometimes ► Do not ► Occasionally ► **Not always**

Question No: 22 (Marks: 1) - Please choose one

In TCPIP communication fragmentation is responsibility of

► TCP ► IP **► Both TCP and IP** ► Internet

Question No: 23 (Marks: 1) - Please choose one

Access to the internet became easy after the invention of

► WWW & Web Browsers

► Mainframes

► Binary system

► Signals

Question No: 24 (Marks: 1) - Please choose one

Which one is the example of spreadsheet software ?

► MS Word ► MS PowerPoint ► **MS Excel** ► MS Access

Question No: 25 (Marks: 1) - Please choose one

User can remotely log on to a computer and can have a control over it like a local user using

► TelNet Protocol

► TelNet Protocol and connected to the user through TCP/IP network

► TelNet protocol and FTP

► TCP/IP and FTP

Question No: 26 (Marks: 1) - Please choose one

If incorrectly we enter the negative age it is check by

► **Limit Integrity** ► Type Integrity ► Referential Integrity ► Physical Integrity

Question No: 27 (Marks: 1) - Please choose one

---------- is a digital programmable mechanical machine

► **Analytical Engine** ► Difference Engine ► Harvard Mark 1 ► Mechanical engine

Question No: 28 (Marks: 1) - Please choose one



This element of Flow Chart is called_____.

► Process **► Off page connector** ► Decision ► Connector

Question No: 29 (Marks: 1) - Please choose one

In a library's database, if there is an entry in the register for Book # 423 then the corresponding Book must actually exist; is an example of which type of data integrit

► Type integrity ► Limit integrity ►Physical Integrity **►Referential Integrity**

Question No: 30 (Marks: 1) - Please choose one

Ada is a programming language specifically designed for

► Analytical Engine ► Difference Engine ► Harvard Mark 1 ► Mechanical engine

FINALTERM EXAMINATION
CS101- Introduction to Computing (Session - 1)

Question No: 1 (Marks: 1) - Please choose one
Cray-1 was first commercial _____ computer
► **Super** ► Mini ► Micro ► Personal

Question No: 2 (Marks: 1) - Please choose one
The name of first browser was _____
► **Internet Explorer** ► Moziac ► Netscape ► Firefox

Question No: 3 (Marks: 1) - Please choose one
The impact of a digit in a number is determined by its ----------
► Value ► Location ► **Length** ► None of above

Question No: 4 (Marks: 1) - Please choose one
First computer network was _____.
► NSFNET ► FIRSTNET ► **ARPANET** ► ORPHANET

Question No: 5 (Marks: 1) - Please choose one
A variable can be _____ in scope.
► Local ► Global ► **Either local or global**
► None of the given options

Question No: 6 (Marks: 1) - Please choose one
_____ color should be used in background for a good presentation.

► Light ► **Dark** ► Red ► None of the given options

Question No: 7 (Marks: 1) - Please choose one
Which one of the following is not an event handler's attribute?

► Function ► Identifier ► Equal sign

► **String consisting of JavaScript statements**

Question No: 8 (Marks: 1) - Please choose one
Variables allow us to manipulate data through the _____.
► Actual Value ► Reference ► **Length** ► Name

Question No: 9 (Marks: 1) - Please choose one
Which one of the following is NOT a component of Rule Based System?
► Rule Compiler ► Rule Interpreter ► Rules Base ► **Working Memory**

Question No: 10 (Marks: 1) - Please choose one
Fuzzy logic is based on _____.

► Ground facts ► Experience ► Practice **► Approximation**

Question No: 11 (Marks: 1) - Please choose one
a = Math.ceil(12.01)
What will be the value of a ?
► 12 ► 13 ► 12.0 ► 13.01

Question No: 12 (Marks: 1) - Please choose one
Tag used to make a Text Bold is _____

► <BOLD></BOLD> **► <B></B>** ► <BODY></BODY> ► None of these

Question No: 13 (Marks: 1) - Please choose one
<P> </P> and
 tags are not same because

► goes to the next line
►
 goes to the next after next line
► <P></P> goes to the next after next line
► Both are same

Question No: 14 (Marks: 1) - Please choose one
Event handlers are placed in the _____ portion of a Web page as attributes in HTML tags.
► HEAD **► BODY** ► SCRIPT ► TITLE

Question No: 15 (Marks: 1) - Please choose one
Due to working at home, lack of interaction may result in _____ professional growth.
► Slower ► Faster ► Higher ► Improved

Question No: 16 (Marks: 1) - Please choose one
_____ DBMS supports data in terabytes.
► Personal ► Desktop **► Enterprise** ► Single-user

Question No: 17 (Marks: 1) - Please choose one
_____ waits for some time and then launch a function.
► Timeout( ) **► setTimeout( )** ► setTime( ) ► setTimeIn( )

Question No: 18 (Marks: 1) - Please choose one
The responsibilities of the Team Lead includes_____.
► Planning and tracking of the project
► Detailed design
► Professional development of team members
► All of the given options

Question No: 19 (Marks: 1) - Please choose one
_____ is also known as System Architecture
► High level system design
► Low level system design

► Every system design
► Software Requirement

Question No: 20 (Marks: 1) - Please choose one
The key property of the 'Array' object in JavaScript is
► Value **► Length** ► Name
► All of the given choices

Question No: 21 (Marks: 1) - Please choose one
There are _____ ways of calling functions.
► One **► Two** ► Three ► Four

Question No: 22 (Marks: 1) - Please choose one
Which event handler executes the specified JavaScript code when a window/form element loses focus ?
► onBlur ► onLoad ► onUnload ► onFocus

Question No: 23 (Marks: 1) - Please choose one
Popular schemes used for reducing bytes for storage are:
► RGB and Color mapping
► RGB and Dithering
► RGB, Color mapping and Dithering
► Color mapping and Dithering

Question No: 24 (Marks: 1) - Please choose one
Hardware malfunctions is related to
► Data updates **► Data integrity** ► Data security ► Data accessibility

Question No: 25 (Marks: 1) - Please choose one
Users communicate with the computer using a consistent user interface provided by the OS. **► True**
► False

Question No: 26 (Marks: 1) - Please choose one
Extension for saving web page is / are;
► *.html ► *.htm ► *.html and *.htm both are in use
► None of These

Question No: 27 (Marks: 1) - Please choose one
_____ loop is a flow control statement that allows code to be executed repeatedly based on a given Boolean condition.
► For ► Do-While **► If-else** ► While

Question No: 28 (Marks: 1) - Please choose one
onBlur event is occurred for a form element when it _____

► Gets focus ► Losts focus

► Some thing is typed in ► onBlur is not an event

Question No: 29 (Marks: 1) - Please choose one

```
<script>
Number=new Array(5);
for(var i=1; i<=5 ; i=i+1)
{
        for( var k=6; k<=10; k=k+1)
        {
                Number[i]= k*i;
        }
}

</script>
```

For how many times the Nested For Loop shall execute;

► 20
► 15
► 25
► **Shall terminate in first loop.**

Question No: 30 (Marks: 1) - Please choose one

In JavaScript: In order to display the text on browser **Grade A**, which of following statement is True.

► documentwrite("Grade A") ► document.write("Grade A");
► document.write("Grade" && A"); ► **document.write("Grade" && "A");**

FINALTERM EXAMINATION
CS101- Introduction to Computing (Session - 4)

Question No: 1 (Marks: 1) - Please choose one

Success of a website is defined by _____.

►**Use**► Designer ► Developer ► Programmer

Question No: 2 (Marks: 1) - Please choose one

Which one is correct for JavaScript?

► **onMouseOver** ► OnMouseOver ► onmouseover ► All of the given

Question No: 3 (Marks: 1) - Please choose one

An indexed list of elements is called _____.

► Collection ► **Array** ► Set ► Group

Question No: 4 (Marks: 1) - Please choose one

_____ is the way that internet domain names are located and translated into IP addresses.

► FTP ► VoIP ►**DNS** ► TCP

Question No: 5 (Marks: 1) - Please choose one

The browser breaks down the URL into _____ parts.

► 2 ►**3** ► 4 ► 5

Question No: 6 (Marks: 1) - Please choose one

Which one of the following is not an event handler's attribute?

► Function ► Identifier ► Equal sign

► **String consisting of JavaScript statements**

Question No: 7 (Marks: 1) - Please choose one

JavaScript Variables are _____.

► **Dynamically Typed** ► Statically Typed

► Strong Typed ► None of the given options

Question No: 8 (Marks: 1) - Please choose one

Which of the following is NOT a Loop statement?

► For ► While ► **Switch** ► Do-While

Question No: 9 (Marks: 1) - Please choose one

According to a popular heuristic, success is defined by _____.

► **The user** ► The builder ► Both user and builder ► None of the given options

Question No: 10 (Marks: 1) - Please choose one

Which one of the following is an application for artificial intelligence?

► **Robotic** ► Web Agent ► Decision Support System ► All of the given options

Question No: 11 (Marks: 1) - Please choose one

Using only HTML we can create

► Dynamic web pages ►**Static web pages**

► Both Static and Dynamic pages

► None of these

Question No: 12 (Marks: 1) - Please choose one

The _____ is connected to all other modules of the microprocessor.

► **Control unit** ► Memory unit ► Floating Point unit ► Arithmetic and Logic unit

Question No: 13 (Marks: 1) - Please choose one
Which of the followings is NOT a Relational DBMS software.
► Access ► FrontPage ► FileMaker Pro ► **SQL Server**

Question No: 14 (Marks: 1) - Please choose one
country=”Hello Pakistan”;
document.write(country.length);
The out put of the above statement is _____.
► 12 ► 13 ► 14 ► **15**

Question No: 15 (Marks: 1) - Please choose one
The distance among families is _____ because of spending more time on internet.
► **Increased** ► Expanded ► Contracted ► Decreased

Question No: 16 (Marks: 1) - Please choose one
_____ is a field that uniquely identifies each record stored in a table.
► Composite Key ► **Primary key** ► Foreign key ► None of the given options

Question No: 17 (Marks: 1) - Please choose one
Planning and tracking of the project is the responsibility of the_____.
► Architect ► **Team Lead** ► Developer ► Chief Executive Officer

Question No: 18 (Marks: 1) - Please choose one
_____ has great PR skills.
► Architect ► Team Lead ► Project Manager ► **Chief Executive Officer**

Question No: 19 (Marks: 1) - Please choose one
_____ team is responsible for a project after the specification’s stage till the very end.
► Executive ► Architect ► **Development** ► HR

Question No: 20 (Marks: 1) - Please choose one
A large number of networks interconnected physically is called _____
► LAN ► **WAN** ► Internet ► Network collection

Question No: 21 (Marks: 1) - Please choose one
Efficiency is _____ to universality
► Equal ► **Direct proportional** ► Inversely proportional ► Not proportional

Question No: 22 (Marks: 1) - Please choose one
There are _____ ways of calling functions.
► One ► **Two** ► Three ► Four

Question No: 23 (Marks: 1) - Please choose one
Which protocol is use to transfer a file over the network?
► UDP ► **FTP** ► TCP ► OSI

Question No: 24 (Marks: 1) - Please choose one
Writing a response, multiple statements are separated from each other with the help of
► **Period (.)** ► Comma (,) ► Colon (:) ► Semicolon (;)

Question No: 25 (Marks: 1) - Please choose one
Popular schemes used for reducing bytes for storage are:
► RGB and Color mapping ► RGB and Dithering
► RGB, Color mapping and Dithering ► **Color mapping and Dithering**

Question No: 26 (Marks: 1) - Please choose one
_____ has the ability to automate and simplify daily tasks.
► Productivity software ► **Application software**
► System software ► Graphical software

Question No: 27 (Marks: 1) - Please choose one
Which representation technique of algorithm is more suitable for developer to make actual code_____.

► **pseudo code** ► flow chart ► both pseudo code and flow chart ► Heuristics

Question No: 28 (Marks: 1) - Please choose one
_____ is used to terminate all JavaScript statements.
► Colon ► **Semicolon** ► Underscore ► Apostrophe

Question No: 29 (Marks: 1) - Please choose one
CONCATENATE operator is used to_____ elements.

► Subtract ► Multiply ► **Join** ► Add

Question No: 30 (Marks: 1) - Please choose one
In partitioning of program/module, it should be assured that partitioned chunks should be as _____ as possible.
► Dependent ► **Independent** ► Complex ► All of the abov

FINALTERM EXAMINATION
CS101- Introduction to Computing (Session - 3)

Question No: 1 (Marks: 1) - Please choose one
The memory size of the Altair 8800 was
► 128 bytes ► 128 Kilo bytes ► **256 Kilo bytes** ► 256 bytes

Question No: 2 (Marks: 1) - Please choose one
Hexadecimal number system is based on ---------- digits
► 2 ► 8 ► 12 **► 16**

Question No: 3 (Marks: 1) - Please choose one
Which one of the following is not an event handler's attribute?

► Function ► Identifier ► Equal sign

► String consisting of JavaScript statements

Question No: 4 (Marks: 1) - Please choose one
Which is correct?

► onUnload ► onUnLoad ► onUNLOAD ► All of the above

Question No: 5 (Marks: 1) - Please choose one
The most upper right pixel of the screen is of _____ color.
► Any ► Red ► Green ► Blue

Question No: 6 (Marks: 1) - Please choose one
Which of the following is NOT a Loop statement?
► For ► While **► Switch** ► Do-While

Question No: 7 (Marks: 1) - Please choose one
When'+' operator is used with string operands, it _____ both strings.
► Adds ► Subtracts ► Concatenates ► Compares

Question No: 8 (Marks: 1) - Please choose one
_____ organization is replacing the old-style layered, tree-structured organizational model.
► Network ► Hierarchical ► Matrix **► None of the given options**

Question No: 9 (Marks: 1) - Please choose one
Due to working at home, lack of interaction may result in _____ professional growth.
Slower Faster Higher Improved

Question No: 10 (Marks: 1) - Please choose one
Spies of one business monitoring the network traffic of their competitors' _____.
Industrial Intelligence Industrial Espionage Industrial Spying Industrial Surveillance

Question No: 11 (Marks: 1) - Please choose one
The key responsibilities of a project manager is _____.

Planning and tracking of the project Arranging of the appropriate resources
Client relationship management **All of the given options**

Question No: 12 (Marks: 1) - Please choose one
Sequence of steps that is taken to solve a problem is called _____.

Algorithm Operating System Application software None of the given options

Question No: 13 (Marks: 1) - Please choose one
CELLPADDING determines the distance between the _____ of the cell and the contents of the cell
Caption **Border** Alignment Empty space

Question No: 14 (Marks: 1) - Please choose one
DSS stands for:
Dual System Security Decision Support System Digital System Solver **Dynamic System Security**

Question No: 15 (Marks: 1) - Please choose one
Flow control constructs in JavaScript includes:
If-Else Loops and If -Else **Switch and If-Else** All of the given choices

Question No: 16 (Marks: 1) - Please choose one
Assignment operator in JavaScript is represented by:
= **= =** **=>** **>=**

Question No: 17 (Marks: 1) - Please choose one
In a System having many parts to be designed, one should always do the _____ first
Hard part Simple part Development part Quality part

Question No: 18 (Marks: 1) - Please choose one
Which protocol is used to send email ?
FTP **SMTP** TELNET All of the given choices

Question No: 19 (Marks: 1) - Please choose one
Those Systems are “Intelligent System” that mimics some aspects of
Software deployment **Human thought** Speaking power Computing

Question No: 20 (Marks: 1) - Please choose one

```
<script>
Number=new Array(5);for(var i=1; i<=5 ; i=i+1)
{
        for( var k=6; k<=10; k=k+1)
         {
                    Number[i]= k*i;
```

```
        }
}
```

</script>

For how many times the Nested For Loop shall execute;

20 15 25 **Shall terminate in first loop.**

Question No: 21 (Marks: 1) - Please choose one

Which of the following is a valid html tag?

► <html> ► <HTML> ► <htML> **► All of the above**

Question No: 22 (Marks: 1) - Please choose one

Which of the following memory retains its information when the power to the system is turned off?

► RAM **► ROM** ► DIMM ► DRAM

Question No: 23 (Marks: 1) - Please choose one

The output of **document.write("2" + Math.PI) ; is_____.**

► 23.141592653589793 ► 3.146 ► 2.3141592653589793 **► None of them**

Question No: 24 (Marks: 1) - Please choose one

Logic Bombs executes its payload when _____

► A programs run
► A predetermined event occurs
► DoS attack is launched
► A file is copied from one folder to another

Question No: 25 (Marks: 1) - Please choose one

Which Internet Service is comparatively Slow but Inexpensive and Fast.

► E-mail ► Instant Messaging ► Web ► None of the given

Question No: 26 (Marks: 1) - Please choose one

Super computers consists of more than one parallel processors because

► One big processor is more expensive than parallel processors
► Through parallel processors problems can be solved easily
► Small processors are easy to manufacture
► All of the given

Question No: 1 (Marks: 1) - Please choose one
A procedure that usually, but not always, works or that gives nearly the right answer is called
► Algorithm ► Logarithm **► Heuristic** ► Methodology

Question No: 2 (Marks: 1) - Please choose one
Which of the following is NOT an Application Software?

► Word Processor ► Web Browser **► Windows XP** ► MS Excel

Question No: 3 (Marks: 1) - Please choose one
Operating System talks to and manages devices through
► Loader ► File Manager ► Memory Manager **► Device Driver**

Question No: 4 (Marks: 1) - Please choose one
You can _____ from/to a website containing interactive forms.
► Only read ► Only write **► Read and write** ► Not read and write

Question No: 5 (Marks: 1) - Please choose one
When the user needs something to be done by the computer, he/she gives instructions in the form of _____ to computer ____
► Software, Hardware ► Hardware, Software
► System Software, Application Software ► Graph, Monitor

Question No: 6 (Marks: 1) - Please choose one
There is a battery on the motherboard to:
► Give power to the processor **► Save information when computer is off**
► Save information when computer is on ► Give power to the motherboard

Question No: 7 (Marks: 1) - Please choose one
_____ is simply a fast port that lets you connect computer peripherals and consumer electronics to your computer without restart.
► Freeware ► Shareware **► Firewire** ► Firmware

Question No: 8 (Marks: 1) - Please choose one
Which one is correct?

► <BODY></BODY> ► <body></body>
► Both <BODY></BODY> and <body></body> ► <BODY/>

Question No: 9 (Marks: 1) - Please choose one
The weaknesses of the computer are:
► Pattern recognition & Storage ► Speed & Innovative ideas
► Pattern recognition & Innovative ideas ► Speed & Storage

Question No: 10 (Marks: 1) - Please choose one
The key strengths of computers are
► Speed ► Storage ► Do not get bored **► All of the given choices**

Question No: 11 (Marks: 1) - Please choose one
Which one is correct?

► <HEAD> </HEAD> ► <HEAD> <END>
► <HEAD> </END> ► <HEAD> <\HEAD>

Question No: 12 (Marks: 1) - Please choose one
Everything that JavaScript manipulates is treated as:
► Object ► Window ► Text ► Script

Question No: 13 (Marks: 1) - Please choose one
A process in which user's browser check the form's data is called
► Server-Side Scripting **► Client-Side Scripting**
► Bowser Scripting ► Form Scripting

Question No: 14 (Marks: 1) - Please choose one
---------- is volatile memory
► RAM ► ROM ► Hard Disk ► CD ROM

Question No: 15 (Marks: 1) - Please choose one
WYSIWYG stands for
► What you say is what you get ► Where you see is where you go
► What you see is what you get ► When you see is when you get

Question No: 16 (Marks: 1) - Please choose one
What is/are the use/uses of Word processor?
► To write a letter ► To write Research paper or report
► To create address labels **► All of the given**

Question No: 17 (Marks: 1) - Please choose one
_____ is the example of Shrink-wrapped software
► PIA information system ► WinZip trial pack ► Linux **► MS Word**

Question No: 18 (Marks: 1) - Please choose one
_____ interacts directly with the computer Hardware
► Compiler **► Operating system** ► Application software ► Assembler

Question No: 19 (Marks: 1) - Please choose one

Which of the following symbol is used for multiple line comments in JavaScript?

► / ► // ► /* ► //*

Question No: 20 (Marks: 1) - Please choose one

Consider the following statement written in JavaScript:
str = ”Hello” + ” World”

What will be the value of str ?

► **HelloWorld** ► Hello World ► Hello + World ► It will result in error

Question No: 21 (Marks: 1) - Please choose one

_____ give us the ability to manipulate data through reference instead of actual value.

► **Constants** ► **Variables** ► Data Types ► Operators

Question No: 22 (Marks: 1) - Please choose one

Bringing subsystems together to form the system is called

► **Integration** ► Merging ► Splitting ► Operation & Maintenance

Question No: 23 (Marks: 1) - Please choose one

Preliminary exploration of possible solutions, technologies, suppliers is called

► Viability ► **Feasibility** ► Specification ► Integration

Question No: 24 (Marks: 1) - Please choose one

Algorithm gives us:

► Definition of a problem ► **Sequence of steps to solve a problem**
► Proper understanding of a problem ► Solution to a problem

Question No: 25 (Marks: 1) - Please choose one

Web site is collection of related _____

► Web pages ► **Information** ► Search Engines ► None of the given choices

Question No: 26 (Marks: 1) - Please choose one

Information on World Wide Web is _____ unified.

► Physically ► **Logically** ► Really ► None of the given choices

Question No: 1 (Marks: 1) - Please choose one
Which function returns a randomly selected floating point number between 0 and 1 ?
► floor(x) ► ceil(x) **► random()** ► round(x)

Question No: 2 (Marks: 1) - Please choose one
Functions are also called:
► Heuristics ► Variables ► Arrays **► Subprograms**

Question No: 3 (Marks: 1) - Please choose one
In JavaScript, each element of array can store data of type
► A Number ► An Array ► A String variable **► All of the given choices**

Question No: 4 (Marks: 1) - Please choose one
The weaknesses of the computer are:
► Pattern recognition & Storage ► Speed & Innovative ideas
► Pattern recognition & Innovative ideas ► Speed & Storage

Question No: 5 (Marks: 1) - Please choose one
Processed data is called _____.
► Information ► Data ► Entity ► Attribute

Question No: 6 (Marks: 1) - Please choose one
Many developers write the _____ first and then incrementally convert each line into _____.
► Real code & Pseudo code **► Pseudo code & Real code**
► Real code & Artificial code ► **None of the given options**

Question No: 7 (Marks: 1) - Please choose one
When we buy a software package, we do not really buy it, we just by a license that allows us to use it, the _____stays with the maker.
► Agreement **► Ownership** ► Membership ► Software

Question No: 8 (Marks: 1) - Please choose one
Name, Border, Source are the _____ of the image object.
► Event Handler **► Properties** ► Methods ► None of the given options

Question No: 9 (Marks: 1) - Please choose one
Using smart editors they can automatically color different parts of statements in different colors e.g. HTML tags in _____ color.
► Green ► Grey **► Blue** ► None of the given options

Question No: 10 (Marks: 1) - Please choose one
_____ is in Executive team.
► Project Manager ► CEO ► Team Lead ► Developer

Question No: 11 (Marks: 1) - Please choose one
Module level design and unit testing the responsibility of _____.
► Team Lead **► Developer** ► Project Manager ► Quality Assurance Expert

Question No: 12 (Marks: 1) - Please choose one
_____ team is responsible for a project after the specification's stage till the very end.
► Executive ► Architect **► Development** ► HR

Question No: 13 (Marks: 1) - Please choose one
_____ waits for some time and then launch a function.
► Timeout( ) **► setTimeout( )** ► setTime( ) ► setTimeIn( )

Question No: 14 (Marks: 1) - Please choose one
Which of the following is NOT an event handler for image object?
► onAbort ► onError ► onLoad **► onUser**

Question No: 15 (Marks: 1) - Please choose one
_____ is a field that uniquely identifies each record stored in a table.
► Composite Key ► **Primary key** ► Foreign key ► None of the given options

Question No: 16 (Marks: 1) - Please choose one
Distance learning has got a boost due to the _____.
► Easy communication ► Online interactive contents ► Flexibility
► All of the given options

Question No: 17 (Marks: 1) - Please choose one
By default in a web page Hyper Link for another web page is represented as _____

► Blue only ► Black and Underlined ► Blue and Bold **► Blue and Underlined**

Question No: 18 (Marks: 1) - Please choose one
To store rounded number of 8.6 in a variable called "r_number", we write _____.
► r_number=Maths.round(8.6) ► r_numbers=Maths.rounds(8.6)
► r_number=Math.rounds(8.6) **► r_number=Math.round(8.6)**

Question No: 19 (Marks: 1) - Please choose one
Which one is the best option for designing a Medical Expert System?
► Rule Based System ► Genetic Algorithm ► Fuzzy Logic ► Neural Network

Question No: 20 (Marks: 1) - Please choose one
Variables allow us to manipulate data through the _____.
► Actual Value **► Reference** ► Length ► Name

Question No: 21 (Marks: 1) - Please choose one
Which is correct?

► onUnload ► onUnLoad ► onUNLOAD ► All of the above

Question No: 22 (Marks: 1) - Please choose one
Capturing events and responding to them is called _____.

► Function Handling **► Event Handling** ► Event Procedure ► All of the given option

Question No: 23 (Marks: 1) - Please choose one
_____ color should be used in background for a good presentation.

► Light **► Dark** ► Red ► None of the given options

Question No: 24 (Marks: 1) - Please choose one
Which of the following symbol is used for multiple line comments in JavaScript?

► / ► // **► /*** ► //*

Question No: 25 (Marks: 1) - Please choose one
In JavaScript, what will be the result of the follwoing operation
79%3

► 0 ► 1 ► 2 ► 3

Question No: 26 (Marks: 1) - Please choose one
A new cell using HTML is added in table row by
► <TC>…</TC> ► <TR>…</TR>
► <TD>…</TD> ► <NC>…</NC>

Question No: 27 (Marks: 1) - Please choose one
TCP stands for _____.
► Total communication protocol ► Transmission control protocol
► Transfer control protocol ► Transfer collection protocol

Question No: 28 (Marks: 1) - Please choose one
What is NOT a key factor while designing a website?
► Usability ► User-friendly ► Consistency ► Complexity

Question No: 29 (Marks: 1) - Please choose one
It represents the _____ flow chart element.

► Process ► Input or Output ► Decision ► Connector

Question No: 30 (Marks: 1) - Please choose one
Vacuum tubes were replaced by ___
► Punch cards ► Transistors ► Micro Processors ► Resistors

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The transistor is a solid state semiconductor device used for amplification and switching, and has __three_____ terminals.
► one ► two ► three ► four

Question No: 2 (Marks: 1) - Please choose one
Blue Pacific is a name of ____Super__ computer.
► Mini ► Desktop ► Micro ► Super

Question No: 3 (Marks: 1) - Please choose one
Monte Carlo algorithm is an example of Randomized algorithm
► Randomized algorithm ► Greedy algorithm

► both greedy and randomized ► Heuristics

Question No: 4 (Marks: 1) - Please choose one
A set of stand alone productivity applications designed to work together known as __ Productivity software suites .

► **Productivity software suites** ► Compiled software
► Secure software ► Intelligent software

Question No: 5 (Marks: 1) - Please choose one
The most used form tag is the <input> tag. - False
► True ► **False**

Question No: 6 (Marks: 1) - Please choose one
What is the key feature of computer which is against human nature.?
Can't get bored.

► **Can't get bored**. ► Pattern recognition ► Repetition ► None

Question No: 7 (Marks: 1) - Please choose one
___ Word Processor Software __ was designed as a replacement for typewriter
► Spreadsheet Software ► **Word Processor Software**
► Presentation Software ► Database Software

Question No: 8 (Marks: 1) - Please choose one
Forms can be submitted by using _____2____ different methods
► **2** ► 3 ► 4 ► 5

Question No: 9 (Marks: 1) - Please choose one
To display a checkbox on the web page, we use __INPUT_ tag
► CHECKBOX ► CHECK ► **INPUT** ► INPUTBOX

Question No: 10 (Marks: 1) - Please choose one
_Name __ attribute of FORM tag is used to mention a URL when the form is being submitted
► **name** ► action ► method ► submit

Question No: 11 (Marks: 1) - Please choose one
You can __ _____ from/to a website containing interactive forms.
► Only read ► Only write ► **Read and write** ► Not read and write

Question No: 12 (Marks: 1) - Please choose one
Using COLSPAN, number of rows of the current cell should extend itself None of the given choices
► Upward ► **Downward**

► Both Upward and Downward ► None of the given choices

Question No: 13 (Marks: 1) - Please choose one
ASCII WHITE is the fastest Super computer which can perform _1.3 trillion__ calculations in one second.

► 1.3 billion ► **1.3 trillion** ► 1.3 miillion ► 1.3 thousand

Question No: 14 (Marks: 1) - Please choose one
_HTML___ is a related collection of WWW files that includes a beginning file called a homepage
► **HTML** ► Website ► HTTP ► Web page

Question No: 15 (Marks: 1) - Please choose one
If a computer could pass the Turing test then it would be able to: think like human beings
► **think like human beings** ► do the things faster

► win a million dollar prize► store more information

Question No: 16 (Marks: 1) - Please choose one
The key strengths of computers are - Speed
► Speed ► Storage ► Do not get bored ► **All of the given choices**

Question No: 17 (Marks: 1) - Please choose one
Compared to vacuum tubes, Transistors offer: All of the given choices
► Much smaller size ► Better reliability

► Much lower cost ► **All of the given choices**

Question No: 18 (Marks: 1) - Please choose one
Which of the following is NOT a component of IC? Resistors
► Transistors ► Diodes ► **Resistors** ► Vacuum tubes

Question No: 19 (Marks: 1) - Please choose one
When we use <INPUT type="password">, what will happen? - Text will be in **** format

► Text will not be visible ► Text will be in normal format

► **Text will be in **** format** ► Text will be in #### format

Question No: 20 (Marks: 1) - Please choose one
Spread sheet is a type of _ Mathematical software _____.
► Productivity software ► Engineering software
► **Mathematical software** ► Business software

Question No: 21 (Marks: 1) - Please choose one
Word Processor is a ____ Application Software__
► System Software ► **Application Software** ► Device ► Utility

Question No: 22 (Marks: 1) - Please choose one
_ Utility Program refers to the firmware code which is run by an IBM compatible PC when first powered on.
► DOS ► BIOS ► **Utility Program** ► None of these

Question No: 23 (Marks: 1) - Please choose one
A computer program that facilitates the communication between the computer and a peripheral device is called____ Language Translator _____
► Operating system ► Utilities ► **Language Translator** ► Device Drives

Question No: 24 (Marks: 1) - Please choose one
In JavaScript, what will be the result of the following operation 79%3
► 0 ► 1 ► 2 ► **3**

Question No: 25 (Marks: 1) - Please choose one
Which of the following number system is used by microprocessor? Binary
► **Binary** ► Decimal ► Octal ► Hexadecimal

Question No: 26 (Marks: 1) - Please choose one
Web site is collection of related ___ Information___
► Web pages ►**Information** ► Search Engines ► None of the given choices

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CS101 Introduction to Computing FINAL TERM PAPERS

Final TERM EXAMINATION Spring 2010
Final CS101- Introduction to Computing
(Session - 2

vulmshelp.com

Question No: 1 (Marks: 1) - Please choose one

Humans are better than computers at:

► Efficiency

► Accuracy

► **Pattern recognition**

► None of the given choices

Question No: 2 (Marks: 1) - Please choose one

Cray-1 was first commercial _____ computer

► **Super**

► Mini

► Micro

► Personal

Question No: 3 (Marks: 1) - Please choose one

URL is a/an _____

► Device

► Component

► **Address**

► Tool

Question No: 4 (Marks: 1) - Please choose one
Mainframe Computers are also called _____

- ► **Enterprise Servers**
- ► Personal Servers
- ► Enterprise Managers
- ► Window Servers

Question No: 5 (Marks: 1) - Please choose one Which of the following is NOT a category of Mobile Computers?

- ► Laptop
- ► Palmtop
- ► **Desktop**
- ► Wearable

Question No: 6 (Marks: 1) - Please choose one Preliminary exploration of possible solutions, technologies, suppliers is called

- ► Viability
- ► **Feasibility**
- ► Specification
- ► Integration

Question No: 7 (Marks: 1) - Please choose one _____ give us the ability to manipulate data through reference instead of actual value.

- ► Constants
- ► **Variables**
- ► Data Types
- ► Operators

Question No: 8 (Marks: 1) - Please choose one
Consider the following statement written in JavaScript:

str = ”Hello” + ”
World” What will be the value of str ?

- ► **HelloWorld**
- ► Hello World
- ► Hello + World
- ► It will result in error

Question No: 9 (Marks: 1) - Please choose one
A tool that helps you to find the synonyms is called _____.

► Language
► Paragraph

► **Thesaurus**
► Symbol

Question No: 10 (Marks: 1) - Please choose one Communication protocol is a _____that governs the flow of information over a network

► Set of protocols
► **Set of rules**
► Device
► Set of methods

Question No: 11 (Marks: 1) - Please choose one If a computer could pass the Turing test then it would be able to:

► **think like human beings**
► do the things faster
► win a million dollar prize
► store more information

Question No: 12 (Marks: 1) - Please choose one The first Web browser with a GUI was generally available in:

► 1992
► **1993**
► 1994
► 1995

Question No: 13 (Marks: 1) - Please choose one
Web is a unique invention by humans in terms that it is:

► accessible to only the owners who control it

► accessible from particular locations only

► accessible to all humans

► accessible to only the educational institutes

Question No: 14 (Marks: 1) - Please choose one

In this URL http://www.msn.com , _____identifies the domain name

► http

► www

► msn

► com

Question No: 15 (Marks: 1) - Please choose one _____ is simply a fast port that lets you connect computer peripherals and consumer electronics to your computer without restart.

► Freeware

► Shareware

► Firewire

► Firmware

Question No: 16 (Marks: 1) - Please choose one Which of the following is NOT supported by PC's power supply.

► -12 and +12 V DC

► -10 and +10 V DC

► -5 and + 5 V DC

► All are supported

Question No: 17 (Marks: 1) - Please choose one In which case Cache Memory is used

► To increase RAM speed

► To overcome BUS speed

► To overcome Speed rate between RAM and CPU

► To overcome CPU speed

Question No: 18 (Marks: 1) - Please choose one To display a single line text area on the web page, we use ___ tag

► TEXT

► TEXTBOX
► **INPUT** ► INPUTBOX

Question No: 19 (Marks: 1) - Please choose one If an algorithm is syntactically correct, but semantically incorrect then this situation is

► Very good situation

► **Very dangerous situation**

► Not very bad

► Neutral situation

Question No: 20 (Marks: 1) - Please choose one

Users communicate with the computer using a consistent user interface provided by the OS.

► **True**

► False

Question No: 21 (Marks: 1) - Please choose one

Application developers do not need to know much about the HW, especially the microProcessor, while they are developing their application.

► **True**

► False

Question No: 22 (Marks: 1) - Please choose one

The first spreadsheet program was invented by

► Charles Babbage

► **Dan Bricklin**

► Paul Graham

► John von Neumann

Question No: 23 (Marks: 1) - Please choose one Which representation technique of algorithm is more suitable for developer to make actual code_____.

► **pseudo code**

► flow chart

► both pseudocode and flowchart

► Heuristics

Question No: 24 (Marks: 1) - Please choose one
_____ is used to terminate all JavaScript statements.

► Colon ► **Semicolon** ► Underscore ► Apostrophe

Question No: 25 (Marks: 1) - Please choose one In javascript cookies can be created for future use_____.

► Easily

► No facility at all

► This is not possible without Java language.

► **Cookies are files so java script can not handle it.**

Question No: 26 (Marks: 1) - Please choose one When the microprocessor desires to look at a piece of data, it checks in the _____ first.

► RAM ► ROM ► hard disk

► **cache**

Question No: 1 (Marks: 1) - Please choose one Using Java Script you can write a character at random location on screen

► By applying randomCh() method

► With the help of String object

► With the help of random character property

► There is no built in approach in Javascript

Question No: 2 (Marks: 1) - Please choose one If incorrectly we enter the negative age it is check by

► **Limit Integrity**

► Type Integrity ► Referential Integrity ► Physical Integrity

Question No: 3 (Marks: 1) - Please choose one The Encryption of data is related to

► Data updates

► **Data security**

► Data integrity ► Data accessibility

Question No: 4 (Marks: 1) - Please choose one
Which protocol is used to transfer a file over the network ?

► UDP

► **FTP**

► TCP

► OSI

Question No: 5 (Marks: 1) - Please choose one One can send an email message to a remote computer using _____ protocol

► HTTP

► **SMTP**

► FTP

► TELNET

Question No: 6 (Marks: 1) - Please choose one In a System having many parts to be designed, one should always do the _____ first

► **Hard part**

► Simple part ► Development part ► Quality part

Question No: 7 (Marks: 1) - Please choose one Flow control constructs in JavaScript includes:

► If-Else ►

Loops and If -Else

► **Switch and If-Else**

► All of the given choices

Question No: 8 (Marks: 1) - Please choose one ___ provides a simple, consistent way for applications to interact with the HW without having to know all the details of the HW

► Explorer.exe

► **System Files**

► Operating System Application Software

Question No: 9 (Marks: 1) - Please choose one Machine language is also called

► Assembly Language

► **Binary Language**

► High Level Language

► HTML Language

Question No: 10 (Marks: 1) - Please choose one _____ is the best known builder for supercomputers.

► Sun

► **Cray Research**

► Microsoft ► Apple

Question No: 11 (Marks: 1) - Please choose one The weaknesses of the computer are:

► Pattern recognition & Storage

► Speed & Innovative ideas

► **Pattern recognition & Innovative ideas**

► Speed & Storage

Question No: 12 (Marks: 1) - Please choose one Communication protocol is a _____that governs the flow of information over a network

► Set of methods ► Set of protocols

► **Set of rules**

► Device

Question No: 13 (Marks: 1) - Please choose one _____ team is responsible for the maintenance, expansion , improvement of the infrastructure consisting of workstations,

networking equipment, software and network security.

► Support ► Configuration Management ► Quality Assurance

► **Developer**

Question No: 14 (Marks: 1) - Please choose one _____ team consists of the sharpest technical minds in the company.

► **Architecture**

► Business Development

► Configuration Management ► Developer

Question No: 15 (Marks: 1) - Please choose one

_____ is responsible for day to day operations.

► CEO

► **COO**

► CMSO ► Developer

Question No: 16 (Marks: 1) - Please choose one One of the key responsibilities of the _____ is client relationship management.

► **Project Manager** ► Team Lead ► Developer ► Quality Assurance Engineer

Question No: 17 (Marks: 1) - Please choose one What is the major problem with flash based website?

► **Its two heavy** ► Cannot be indexed ► Less attractive ► Inaccessible

Question No: 18 (Marks: 1) - Please choose one Which of the following is NOT an event handler for image object?

► onAbort ► onError ► onLoad ► onUser

Question No: 19 (Marks: 1) - Please choose one

The organizations are learning that business can be done in a more effective manner if emphasis is placed upon _____.

► Cooperation ► **Shared responsibility** ► Networking ► All of the given

options

Question No: 1 (Marks: 1) - Please choose one

It represents the _____ flow chart element.

► Flow Line ► Connector ► Off-page connector

► **Start or Stop**

Question No: 2 (Marks: 1) - Please choose one

What is NOT a key factor while designing a website?

► Usability ► User-friendly ► Consistency ► **Complexity**

Question No: 3 (Marks: 1) - Please choose one

_____

_% of the users have left websites in frustration due to poor navigation.

► 40 ► 62

► **83**

► 91

Question No: 4 (Marks: 1) - Please choose one

In JavaScript, a variable declaration is

► **Optional** ► Mandatory ► Not allowed ► None of the given

Question No: 5 (Marks: 1) - Please choose one

A protocol used for receiving email messages is called _____.

► URL ► Telnet ► **POP3** ► SMTP

Question No: 6 (Marks: 1) - Please choose

one

Which is correct?

► **onUnload** ► onUnLoad ► onUNLOAD ► All of the above

Question No: 7 (Marks: 1) - Please choose one

Serial arrangement in which things follow logical order or a recurrent pattern, such as statements executing one by one, is called _____.

► **Loop** ► Sequence ► Condition ► Array

Question No: 8 (Marks: 1) - Please choose one

Variables allow us to manipulate data through the _____.

► Actual Value ► **Reference** ► Length ► Name

Question No: 9 (Marks: 1) - Please choose one

Fuzzy logic is based on _____.

► Ground facts ► Experience ► Practice ► **Approximation**

Question No: 10 (Marks: 1) - Please choose one

Word Processor is a

_____

► System Software ► **Application Software** ► Device ► Utility

Question No: 11 (Marks: 1) - Please choose one

In the old days, databases did NOT support _____.

► Number ► Boolean ► **Video** ► Text

Question No: 12 (Marks: 1) - Please choose one

In tabular storage, fields placed in a particular row are strongly _____.

► Independent ► Dependent ► **Interrelated** ► Inconsistent

Question No: 13 (Marks: 1) - Please choose one

Due to working at home, lack of interaction may result in _____ professional growth.

► **Slower** ► Faster ► Higher ► Improved

Question No: 14 (Marks: 1) - Please choose one

Distance learning has got a boost due to the _____.

► Easy communication ► Online interactive contents ► Flexibility

► **All of the given options**

Question No: 15 (Marks: 1) - Please choose one

_____ technique can be used to create smooth animations or to display one of several images based on the requirement.

► Image downloading ► **Image preloading** ► Image uploading

► Image postloading

Question No: 16 (Marks: 1) - Please choose one

The _____ is becoming the preferred organizational structure for more and more organizations with the passage of time.

► Tree structured organizational model

► **Network paradigm** ► Hierarchical structure ► None of the given options

Question No: 17 (Marks: 1) - Please choose one

The group of technologies concerned with the capturing, processing and transmission of information

in the digital electronic form is called _____.

► Telecom Engineering

► Computer Engineering

► Computer Science

► **Information Technology**

Question No: 18 (Marks: 1) - Please choose one

A large number of networks interconnected physically are called _____

► **LAN** ► MAN ► Internet ► Network collection

Question No: 19 (Marks: 1) - Please choose one

TCP stands for _____.

► Transfer Center protocol ► **Transmission Control Protocol**

► Transmission Center Protocol ► Telephone Center Protocol

Question No: 20 (Marks: 1) - Please choose one

A collection of data organized in such a way that the computer can quickly search for a desired data item is known as:

► Retrieving ► **Database** ► Information ► DBMS

Question No: 21 (Marks: 1) - Please choose one

_____ is simply a fast port that lets you connect computer peripherals and consumer electronics to your computer without restart.

► Freeware ► Shareware ► **Firewire** ► Firmware

Question No: 22 (Marks: 1) - Please choose one

Structures, in which another list starts before the first list is finished, are called:

► Multiple Lists ► **Nested Lists** ► Ordered Lists ► Un-ordered Lists

Question No: 23 (Marks: 1) - Please choose one

The key property of the 'Array' object in JavaScript is

► Value ► **Length** ► Name ► All of the given choices

Question No: 24 (Marks: 1) - Please choose one

Which one is the example of spreadsheet software?

► MS Word ► MS PowerPoint ► **MS Excel** ► MS Access

Question No: 25 (Marks: 1) - Please choose one

The Encryption of data is related to

► Data updates ► **Data security** ► Data integrity ► Data accessibility

Question No: 26 (Marks: 1) - Please choose one

_____ is the process of analyzing large databases to identify patterns.

► Data normalization ► Data management ► **Data Mining** ► None of the given options

Question No: 27 (Marks: 1) - Please choose one

Which is the user- friendly way of presenting data?

► Query ► Form ► **Report** ► All of the given options

Question No: 28 (Marks: 1) - Please choose one

JavaScript function fixed () has equivalent HTML tag-set ____

► <.FIX>.....</FIX> ► <F>.....</F>

► **<PRE>..... </PRE>** ► <H>.....</H>

Question No: 29 (Marks: 1) - Please choose one

<Form> Tags always placed between the <BODY> and </BODY> tags of a Web page

► **True**

► False

Question No: 30 (Marks: 1) - Please choose one

Javascript has ------- ---------- ability to create and draw graphics.

► Limited ► Versatile ► Medium ► **Not at all**

Final term paper

1-when actions depends upon the values of multiple variables we will use -----?

1-iF

2-else

3-if----else

4-none

2-when the exact number of iterations is known use the ----loop ?

1-for 2-if 3-while 4-none

3-when the number of iterations depend upon a condition being met use the ------ loop

1-for 2-switch 3-while 4-none

4-the key property of ‘’array ‘’object is ----------?

1-length 2-width 3-single 4-none

5-two of the key ‘’array ‘’methods are reverse ()-sort()

1-true 2-false

6-javascript array are -------?

1-multiple

2-heterogeneous

3-homogenous 4-none

7------multiple computers that are connected together to share information and other resources

1-network 2-internets

3-compnetworks 4-none

8 – comp networks can send an email message to a remote computer using the ---- protocol? 1-HTTP 2-FTP 3-SMTP 4-none

9-comp network can browse documents residing on a remote comp using -------?

1-HTTP 2-FTP 3-SMTP 4-none

10-comp networks can download and upload files to a remote comp using ------?

1-HTTP 2-FTP 3-SMTP 4-none

11- network can run a program on remote comp using the ----------?

1-SMTP 2-TELNET 3-HTTP 4-none

12-components of conventional computer networks are except one ?

1-VPN 2-NIC 3-computers 4-hub

13-NIC stands for ----------? 1-national internet cables
2-national interface cards

3-network interface cards 4-none

14-cables are either----------?

1-electrical 2-digital l3-optical 4-1 and 2

15- hub component of comp network is ----------?

1-I/O device 2-traffic controller
3-network traffic controller 4-none

16- optical cables are required by wireless networks

1-true 2-false

17------ a device used to connect several computers to form a network

1-hub 2-cable 3-NIC 4-none

18- a hub has several -----?

1-NIC 2-cables 3-packet 4-ports

19- ------ smaller unit of data transmitted over a comp network

1-hub 2-port 3-packet 4-none

20- all packets travel----------?

1-dependently 2-independently 3-alternatively 4-none

Question No: 1 (Marks: 1) - Please choose
one ---------- was known as "mill" in Analytical engine.

► Memory ► **Processor** ► Monitor ► Mouse

Question No: 2 (Marks: 1) - Please choose
one First electronic computer was

► ABC ► **UNVAC 1** ► Harvard Mark 1 ► IBM PC

Question No: 3 (Marks: 1) - Please choose

one What is NOT a key factor while designing a website?

► Usability ► User-friendly ► Consistency ► **Complexity**

Question No: 4 (Marks: 1) - Please choose one What happens if I start a new list without closing the original one?

► An error will be generated

► **A nested list will be created**

► Previous list will end and a new start. ► Nothing will happen

Question No: 5 (Marks: 1) - Please choose one The most upper right pixel of the screen is of _____ color.

► **Any** ► Red ► Green ► Blue

Question No: 6 (Marks: 1) - Please choose one

A single pixel can acquire approximately _____ color schemes.

► 1 million ► 2 million ► 10 million ► **16 million**

Question No: 7 (Marks: 1) - Please choose one The idea of Neural Networks field is based upon _____.

► Human nature

► **Human brain**

► Human culture

► Human actions

Question No: 8 (Marks: 1) - Please choose one Which one of the following is an application for artificial intelligence?

► **Robotic**

► Web Agent ► Decision Support System ► All of the given options

Question No: 9 (Marks: 1) - Please choose one Register is a kind of _____memory

► **Fast**

► Super fast ► Slow ► Very slow

Question No: 10 (Marks: 1) - Please choose one Which of the following is a true statement?

► Flat-file storage is better than tabular storage.

► **Tabular storage is better than flat-file storage.**

► Flat-file storage is better than relational storage.

► None of the given options

Question No: 11 (Marks: 1) - Please choose one substring(n, m) returns a string containing characters copied from position n to_____.

► m – 2

► **m – 1**

► m + 1 ► m

Question No: 12 (Marks: 1) - Please choose one

The _____ is the old profession which is being eliminated because of computing.

► **Typist**

► Bank manager ► Operational manager ► All of the given options

Question No: 13 (Marks: 1) - Please choose one

The system that manages relational database, is called _____.

► None of the given options

► Database Management System

► Data Management System

► **Relational Database Management**

System

Question No: 14 (Marks: 1) - Please choose one

When web server is busy it gives the following message to the user :

► Time out ► Waiting ► **Server busy** ► None of the given options

Question No: 15 (Marks: 1) - Please choose one The group of technologies concerned with the capturing, processing and transmission of information in the digital electronic form is called _____.

► Telecom Engineering ► Computer Engineering

► Computer Science ► **Information Technology**

Question No: 16 (Marks: 1) - Please choose one _____ team consists of the sharpest technical minds in the company.

► **Architecture** ► Business Development ► Configuration Management ► Developer

Question No: 17 (Marks: 1) - Please choose one

TCP stands for _____.

► Transfer Center protocol ► **Transmission Control Protocol**

► Transmission Center Protocol ► Telephone Center Protocol

Question No: 18 (Marks: 1) - Please choose one A collection of data organized in such a way that the computer can quickly search for a desired data item is known as :

► Retrieving ► **Database** ► Information ► DBMS

Question No: 19 (Marks: 1) - Please choose one Microsoft Word is a type of:

► System Software ► **Freeware Software** ► Shrink-Wrapped Software ► Custom-built Software

Question No: 20 (Marks: 1) - Please choose one Users _____, how things work.

► Analyze in detail ► **Muddle through** ► Figure out ► Read in detail

Question No: 21 (Marks: 1) - Please choose one Popular schemes used for reducing bytes for storage are:

► RGB and Color mapping ► RGB and Dithering

► RGB, Color mapping and Dithering ► **Color mapping and Dithering**

Question No: 22 (Marks: 1) - Please choose one Hardware malfunction is related to

► Data updates ► Data integrity ► Data security ► **Data accessibility**

Question No: 23 (Marks: 1) - Please choose one If incorrectly we enter the negative age it is check by

► **Limit Integrity** ► Type Integrity ► Referential Integrity ► Physical Integrity

Question No: 24 (Marks: 1) - Please choose one Which is the user-friendly way of presenting data ?

► Query ► Form ► **Report** ► All of the given options

Question No: 25 (Marks: 1) - Please choose one Currently the BlueRay DVD can store more than _____ of data.

► 10 GB ► 100 GB ► **50 GB** ► 150 GB

Question No: 26 (Marks: 1) - Please choose one In JavaScript, a || b is interpreted as

► a is true or b is false ► a is true and b is true

► a is false and b is true ► **a is true or b is true or both are true**

Question No: 27 (Marks: 1) - Please choose one
Speakers fall into the hardware category.

► **True** ► False

Question No: 28 (Marks: 1) - Please choose one onBlur event is occurred for a form element when it _____

► Gets focus ► **Loses focus** ► Something is typed in ► onBlur is not an event

Question No: 29 (Marks: 1) - Please choose one You can view a 3-D image on a _____.

► 3-D display ► 2-D display ► **On both 2-D and 3-D displays** ► We can not view a 3-D image

Question No: 30 (Marks: 1) - Please choose one Module level design and unit testing is the responsibility of _____.

► Team Lead ► **Developer** ► Project Manager ► Quality Assurance Expert

Final TERM EXAMINATION CS101- Introduction to Computing (Session - 2) Question No: 1 (Marks: 1) - Please choose one What is NOT a key factor while designing a website?

► Usability ► User-friendly ► Consistency ► **Complexity**

Question No: 2 (Marks: 1) - Please choose one Communications on the internet is controlled by a set of two protocols which are _____.

► IMAP and SMTP ► FTP and HTTP ► **TCP and IP** ► TCP and HTTP

Question No: 3 (Marks: 1) - Please choose one A variable can be _____ in scope.

► Local ► Global ► **Either local or global**

► None of the given options

Question No: 4 (Marks: 1) - Please choose one A protocol used for receiving email messages is called _____.

► URL ► Telnet ► **POP3** ► SMTP

Question No: 5 (Marks: 1) - Please choose one Aliasing problem can be managed by _____the size of pixels.

► **Reducing** ► Increasing ► Gaining ► Modifying

Question No: 6 (Marks: 1) - Please choose one Serial arrangement in which things follow logical order or a recurrent pattern, such as statements executing one by one, is called _____.

► Loop ► **Sequence** ► Condition ► Array

Question No: 7 (Marks: 1) - Please choose one Which of the following data types are recognized by JavaScript?

► Strings ► Numbers ► Undefined ► **All of the given options**

Question No: 8 (Marks: 1) - Please choose one a = Math.ceil(12.01) What will be the value of a ?

► 12 ► **13** ► 12.0 ► 13.01

Question No: 9 (Marks: 1) - Please choose one In the old days, databases did NOT support _____.

► Number ► Boolean ► **Video** ► Text

Question No: 10 (Marks: 1) - Please choose one The organizations are learning that business can be done in a more effective manner if emphasis is placed upon _____.

► Cooperation ► Shared responsibility ► Networking

► **All of the given options**

Question No: 11 (Marks: 1) - Please choose one Module level design is the responsibility of the _____.

► Architect ► Team Lead ► **Developer** ► CEO

Question No: 12 (Marks: 1) - Please choose one _____ errors are caused by the code that somehow violates the rule of the language.

► **Syntax** ► Semantic ► Run time ► Load time

Question No: 13 (Marks: 1) - Please choose one The world's first computer program was written to compute:

► Simple sequence ► Multiple sequence

► **Bernoulli's sequence** ► Increasing sequence

Question No: 14 (Marks: 1) - Please choose one
Microsoft Word is a type of:

► System Software ► Freeware Software

► **Shrink-Wrapped Software** ► Custom-built Software

Question No: 15 (Marks: 1) - Please choose one We need _____ for memory management in computer

► Software ► Hardware ► **Operating System**

► Application Software

Question No: 16 (Marks: 1) - Please choose one _____ is generally measured in terms of the number of steps required to execute an algorithm.

► Space ► **Time** ► Memory and time ► Bandwidth

Question No: 17 (Marks: 1) - Please choose one
PowerBuilder falls in the category of _____.

► Assembly Languages ► **4-th Generation Languages**

► Machine Languages ► High-Level Languages

Question No: 18 (Marks: 1) - Please choose one _____ means to break down into simpler components and analyze.

► Recursion ► **Parsing** ► Scope ► Navigation

**Question No: 19 (Marks: 1) - Please choose one for(var i=1; i<=2;i=i+1) { document.write("Sorted Words:" + "
") }** Which of the following shall be the output of the above code:

►Sorted Words: Sorted Words: ►Sorted Words:Sorted Words:

►Sorted Words: "
" Sorted Words: "
"

► **Sorted Words:
 Sorted Words:
 (correct)**

Question No: 20 (Marks: 1) - Please choose one Assembly languages

allow a programmer to use _____ for numbers.

► Object ► Entity ► **Name** ► Interpreter

Question No: 21 (Marks: 1) - Please choose one _____ means you have only one container to store more than one value in JavaScript.

► Variable ► Matrix ► **Array** ► String

Question No: 22 (Marks: 1) - Please choose one Coding is the responsibility of _____

► Software design ► **Software developer** ► Project manager

► None of given

Question No: 23 (Marks: 1) - Please choose one CEO stands for_____

► Central Executive officer ► Chief External officer

► **Chief executive officer** ► None of given

Question No: 24 (Marks: 1) - Please choose one Decision Support Systems will become a bigger part of the professional life of the_____ .

► Doctors ► Managers ► Marketers ► **All of above**

Question No: 25 (Marks: 1) - Please choose one

The output of fuzzy Logic System is computed by using _____Technique.

► MAX-MAX ► MAX-MIN ► **MIN-MAX** ► None of the given

Question No: 26 (Marks: 1) - Please choose one In the statement Math.PI, Math is _____ and PI is _____.

► Variable, Constant ► Object , Method

► Object , Function ► **Object , Property**

FINAL TERM EXAMINATION CS101-
Introduction to Computing (Session - 2)

Question No: 1 (Marks: 1) - Please choose one

It represents the _____ flow chart element.

► Process ► **Input or Output** ► Decision ► Connector

Question No: 2 (Marks: 1) - Please choose one

Website design should NOT be _____.

► Unified ► **Complex** ► Consistent ► Predictable

Question No: 3 (Marks: 1) - Please choose one

The most upper right pixel of the screen is of _____ color.

► **Any** ► Red ► Green ► Blue

Question No: 4 (Marks: 1) - Please choose one

Which of the following is NOT an example of Multi-user Operating system

► Windows ► Linux ► **DOS** ► Solaris

Question No: 5 (Marks: 1) - Please choose one

According to the heuristic, the number of defects remaining in a system after a given level of tests is proportional to _____.

► **The number found on the very first day.**

► The number found during the development.

► The number found during the

test.

► None of the given options.

Question No: 6 (Marks: 1) - Please choose one

Which one of the following is NOT a component of Rule Based System?

► **Rule Compiler** ► Rule Interpreter ► Rules Base ► Working Memory

Question No: 7 (Marks: 1) - Please choose one

In RDBMS, table rows are called _____.

► Field ► **Record** ► Column ► Query

Question No: 8 (Marks: 1) - Please choose one

_____ can be used for entering, editing, or viewing data, one record at a time.

► Queries ► **Forms** ► Reports ► None of the given options

Question No: 9 (Marks: 1) - Please choose one

Tribal flood network is a _____
software.

► **DoS** ► Scanning ► Utility ► None of the given options

Question No: 10 (Marks: 1) - Please choose one

Unlike virus, _____ is a stand-alone program.

► **Trojan horse** ► Logic bomb ► Worm ► Time bomb

Question No: 11 (Marks: 1) - Please choose one

The key responsibilities of a project manager is _____.

► Planning and tracking of the project

► Arranging of the appropriate resources

► Client relationship
management

► **All of the given options**

Question No: 12 (Marks: 1) - Please choose one

The key responsibilities of the architect of the project
is_____.

► Technology
selection

► High-level
design

► Makes certain that the implementation remains true to the design

► **All of the given options**

Question No: 13 (Marks: 1) - Please choose one

_____ is responsible for day to day
operations.

► CEO ► **COO** ► CMSO ► Developer

Question No: 14 (Marks: 1) - Please choose one

onAbort , onError are the _____ of the image object.

► **Event Handler** ► Properties ► Methods

► None of the given
options

Question No: 15 (Marks: 1) - Please choose one

The tasks performed to detect the exact location of defect is called_____

► **Debugging** ► Testing ► Repairing ► Monitoring

Question No: 16 (Marks: 1) - Please choose one

_____ routes the packets through the internet to go to their destination.

► Protocol ► TCP ► **IP** ► NIC

Question No: 17 (Marks: 1) - Please choose one

When we buy a software package, we do not really buy it, we just by a license that allows us to use it, the _____stays with the maker.

► Agreement ► **Ownership** ► Membership ► Software

Question No: 18 (Marks: 1) - Please choose one

Sequence of steps that is taken to solve a problem is called _____.

► **Algorithm** ► Operating System ► Application software

► None of the given
options

Question No: 19 (Marks: 1) - Please choose one

A collection of data organized in such a way that the computer can quickly search for a

desired data item is known as :

► Retrieving ► **Database** ► Information ► DBMS

Question No: 20 (Marks: 1) - Please choose one

To start an ordered list from 20 instead of 1, we will write

► <OL begin = “20"> ► <OL initiate = “20">

► **<OL start = “20">** ► <OL from = “20">

Question No: 21 (Marks: 1) - Please choose one

_____ are personal computers that are designed to be easily transported and relocated.

► Desktops ► **Portables** ► Servers ► Workstations

Question No: 22 (Marks: 1) - Please choose one

To display a multi-line text area on the web page, we use ___ tag

► TEXT ► **TEXTAREA** ► INPUT ► INPUT AREA

Question No: 23 (Marks: 1) - Please choose one

The first component of an operating system that runs when a typical computer is turned ON, is:

► Device Manager ► File Manager ► **Loader** ► Device Driver

Question No: 24 (Marks: 1) - Please choose one

Pseudo code is written in

► **Complex grammar** ► Plain English ► JAVA ► Pseudo language

Question No: 25 (Marks: 1) - Please choose one

Instead of Full System, one can _____ results from part of a System

► **Not achieve** ► Mostly achieve ► Sometimes achieve ► Achieve

Question No: 26 (Marks: 1) - Please choose one

One can download or upload files to a remote computer using _____ protocol.

► HTTP ► SMTP ► **FTP** ► TELNET

Question No: 27 (Marks: 1) - Please choose one

Which protocol is used to control other computer from our own computer ?

► FTP ► NNTP ► **TELNET** ► None of the given choices

Question No: 28 (Marks: 1) - Please choose one

Which function returns a randomly selected floating point number between 0 and 1 ?

► floor(x) ► ceil(x) ► **random()** ► round(x)

Question No: 29 (Marks: 1) - Please choose one

Global variables can make the logic of a web page.

► Difficult to understand

► Easier to understand and maintain

► Difficult to reuse and maintain

► **Difficult to understand, reuse and maintain**

Question No: 30 (Marks: 1) - Please choose one

Mathematical functions in JavaScript, are accessed by referring to various methods of the _____ object.

► **Math** ► Calculate ► Compute ► None of the given options

FINAL TERM EXAMINATION CS101-
Introduction to Computing (Session - 2)

Question No: 1 (Marks: 1) - Please choose one

Humans are better than computers at :

► Efficiency ► Accuracy ► **Pattern recognition** ► None of the given choices

Question No: 2 (Marks: 1) - Please choose one

TCP stands for _____.

► Total communication protocol ► **Transmission control protocol**

► Transfer control protocol ► Transfer collection protocol

Question No: 3 (Marks: 1) - Please choose one

First computer network was _____.

► NSFNET ► FIRSTNET ► **ARPANET** ► ORPHANET

Question No: 4 (Marks: 1) - Please choose one

A user may access any item on the web through _____.

► **URL** ► Telnet ► POP ► SMTP

Question No: 5 (Marks: 1) - Please choose one

In JavaScript, a variable declaration
is

► **Optional** ► Mandatory ► Not allowed ► None of the given

Question No: 6 (Marks: 1) - Please choose one

According to a popular heuristic, success is defined by _____.

► **The user** ► The builder ► Both user and builder

► None of the given
options

Question No: 7 (Marks: 1) - Please choose one

To store rounded number of 8.6 in a variable called "r_number", we write _____.

► r_numbers=Maths.rounds(8.6) ► r_number=Math.rounds(8.6)

► **r_number=Math.round(8.6)** ► r_number=Maths.round(8.6)

Question No: 8 (Marks: 1) - Please choose one

random() function returns a randomly-selected, floating-point number between _____.

► **0 and 1** ► 0 and 10 ► 0 and -10 ► 0 and -1

Question No: 9 (Marks: 1) - Please choose one

Trinoo is a _____
software.

► **DoS** ► Scanning ► Utility ► None of the given options

Question No: 10 (Marks: 1) - Please choose one

Which attribute of the IMG tag tells us about the source of the image _____.

► source ► path ► loc ► **src**

Question No: 11 (Marks: 1) - Please choose one

The developer report to _____ in a development team.

► **Team Lead** ► Project Manager ► CEO ► IT Manager

Question No: 12 (Marks: 1) - Please choose one

The effective way to not only write programs but also it works properly and furthermore to minimize the time and the development cost of the program is called_____

► Programming Mechanism ► **Programming Methodology**

► Programming Synchronization ► None of the given options

Question No: 13 (Marks: 1) - Please choose one

TCP stands for _____.

► Transfer Center protocol ► **Transmission Control Protocol**

► Transmission Center Protocol ► Telephone Center Protocol

Question No: 14 (Marks: 1) - Please choose one

When we buy a software package, we do not really buy it, we just by a license that allows us to use it, the _____stays with the maker.

► Agreement ► **Ownership** ► Membership ► Software

Question No: 15 (Marks: 1) - Please choose one

Many developers write the _____ first and then incrementally convert each line into _____.

► Real code & Pseudocode ► **Pseudocode & Real code**

► Real code & Artificial code ► None of the given options

Question No: 16 (Marks: 1) - Please choose one

Collection of facts & figures is called _____.

► **Information** ► Data ► Entity ► Attribute

Question No: 17 (Marks: 1) - Please choose one

A collection of data organized in such a way that the computer can quickly search for a desired data item is known as :

► Retrieving ► **Database** ► Information ► DBMS

Question No: 18 (Marks: 1) - Please choose one

To start an ordered list from 20 instead of 1, we will write

► <OL begin = “20"> ► <OL initiate = “20">

► **<OL start = “20">** ► <OL from = “20">

Question No: 19 (Marks: 1) - Please choose one

Using COLSPAN, number of rows of the current cell should extend itself

► Upward ► **Downward**

► Both Upward and Downward ► None of the given choices

Question No: 20 (Marks: 1) - Please choose one

Microsoft Word is a type of:

► System Software ► **Freeware Software**

► Shrink-Wrapped Software ► Custom-built Software

Question No: 21 (Marks: 1) - Please choose one

Compound Statement after decision constructs in JavaScript is enclosed with

► ( ) ► [ ] ► { }; ► **{ }**

Question No: 22 (Marks: 1) - Please choose one

Users _____, how things work.

► Analyze in detail ► **Muddle through** ► Figure out ► Read in detail

Question No: 23 (Marks: 1) - Please choose one

One can send an email message to a remote computer using _____ protocol

► HTTP ► **SMTP** ► FTP ► TELNET

Question No: 24 (Marks: 1) - Please choose one

Writing a response, multiple statements are separated from each other with the help of

► **Period (.)** ► Comma (,) ► Colon (:) ► Semicolon (;)

Question No: 25 (Marks: 1) - Please choose one

With the passage of time the field of Computing and Telecommunication is _____.

► Diverging ► **Converging** ► Becoming different ► Becoming unique

Question No: 26 (Marks: 1) - Please choose one

When we have to show value as part of a whole picture, which type of chart is used.

► Bar chart ► Pie chart ► Line graph ► **None of the given**

Question No: 27 (Marks: 1) - Please choose one

_____ software directly interacts with the user.

► **Application software** ► System software

► Anonymous software ► Interactive software

Question No: 28 (Marks: 1) - Please choose one

Global variables can make the logic of a web page.

► **Difficult to understand** ► Easier to understand and maintain

► Difficult to reuse and maintain ► Difficult to understand, reuse and maintain

Question No: 29 (Marks: 1) - Please choose one

In partitioning of program/module, it should be assured that partitioned chunks should be as _____ as possible.

► Dependent ► **Independent** ► Complex ► All of the above

Final TERM EXAMINATION CS101- Introduction to Computing
(Session - 2) Question No: 1 (Marks: 1) - Please choose one

The memory size of the Altair 8800 was

► 128 bytes ► 128 Kilobytes ► 256 Kilobytes ► **256 bytes**

Question No: 2 (Marks: 1) - Please choose one

A named collection of properties (data, state) and methods (instruction, behavior) is called _____.

► Array ► Function ► Variable ► **Object**

Question No: 3 (Marks: 1) - Please choose one

JavaScript Variables are

► **Dynamically Typed** ► Statically Typed ► Strong Typed

► None of the given options

Question No: 4 (Marks: 1) - Please choose one

https://www.vuhelpcorner.com

Serial arrangement in which things follow logical order or a recurrent pattern, such as statements executing one by one, is called _____.

► Loop ► Sequence ► Condition ► **Array**

Question No: 5 (Marks: 1) - Please choose one

Rule of thumb learned through trial and error is called _____.

► Design ► **Heuristic** ► Plan ► Aim

Question No: 6 (Marks: 1) - Please choose one

According to heuristic, if you can't explain it in _____ minutes, either you don't understand it or it does not work.

► 10 ► 2 ► **5** ► 4

Question No: 7 (Marks: 1) - Please choose one

To store rounded number of 8.6 in a variable called "r_number", we write _____.

► r_numbers=Maths.rounds(8.6) ► r_number=Math.rounds(8.6)

► **r_number=Math.round(8.6)** ► r_number=Maths.round(8.6)

Question No: 8 (Marks: 1) - Please choose one

Using only HTML we can create

► Dynamic web pages ► **Static web pages**

► Both Static and Dynamic pages ► None of these

Question No: 9 (Marks: 1) - Please choose one

_____ function returns the largest integer that is less than or equal to x.

► **round(x)** ► floor ► ceil ► abs(x)

Question No: 10 (Marks: 1) - Please choose one

Due to working at home, contact with colleagues is _____, which may result in _____ quality of work

► Reduced, Poorer ► Reduced, Better ► Increased, Poorer ► **Increased, Better**

Question No: 11 (Marks: 1) - Please choose one

The distance among families is _____ because of spending more time on the internet

https://www.vuhelpcorner.com.

► **Increased** ► Expanded ► Contracted ► Decreased

Question No: 12 (Marks: 1) - Please choose one

When web server is busy it gives the following message to the user :

► Time out ► Waiting ► **Server busy** ► None of the given options

Question No: 13 (Marks: 1) - Please choose one

_____ is designed for detecting viruses and inoculating.

► **Antivirus** ► Utility ► Trojan ► None of the given choices

Question No: 14 (Marks: 1) - Please choose one

The _____ is becoming the preferred organizational structure for more and more organizations with the passage of time.

► Tree structured organizational model ► **Network paradigm**

► Hierarchical structure ► None of the given options

Question No: 15 (Marks: 1) - Please choose one

Planning and tracking of the project is the responsibility of the_____.

► **Project Manager** ► Architect ► Developer ► Chief Executive Officer

Question No: 16 (Marks: 1) - Please choose one

The responsibilities of the Team Lead includes_____.

► **Planning and tracking of the project**

► Detailed design

► Professional development of team members

► All of the given options

Question No: 17 (Marks: 1) - Please choose one

_____ team is responsible for a project after the specification's stage till the very end.

► Executive ► Architect ► **Development** ► HR

Question No: 18 (Marks: 1) - Please choose one

There are _____ types of errors.

► 2 ► **3** ► 4 ► 5

Question No: 19 (Marks: 1) - Please choose one

_____ are the computers that perform at or near the currently highest operational rate for computers.

► Minicomputers ► Microcomputers ► **Supercomputers** ► Personal

Computers

Question No: 20 (Marks: 1) - Please choose one

Which one of these is NOT an example of storage devices?

► Tape ► **RAM** ► Floppy ► DVD

Question No: 21 (Marks: 1) - Please choose one

Forms can be submitted by using _____ different methods

► **2** ► 3 ► 4 ► 5

Question No: 22 (Marks: 1) - Please choose one

Which is NOT true for JavaScript variable name ?

► Student ► Roll_no_1111 ► For ► **_schedule**

Question No: 23 (Marks: 1) - Please choose one

One can browse documents residing on a remote computer using _____ protocol.

► **HTTP** ► SMTP ► FTP ► TELNET

Question No: 24 (Marks: 1) - Please choose one

Which one is the example of spreadsheet software ?

► MS Word ► MS PowerPoint ► **MS Excel** ► MS Access

Question No: 25 (Marks: 1) - Please choose one

User can remotely log on to a computer and can have a control over it like a local user using

► TelNet

Protocol

► **TelNet Protocol and connected to the user through TCP/IP**

network

► TelNet protocol and FTP ► TCP/IP and FTP

Question No: 26 (Marks: 1) - Please choose one

Hardware malfunctions is related to

► Data updates ► Data integrity ► Data security ► **Data accessibility**

Question No: 27 (Marks: 1) - Please choose one

PowerBuilder falls in the category of _____.

► Assembly Languages ► 4-th Generation Languages

► Machine Languages ► **High-Level Languages**

Question No: 28 (Marks: 1) - Please choose one

Backbone is also called as _____.

► **vBNS** ► BNS ► vHBNS ► HBNS

Question No: 29 (Marks: 1) - Please choose one

Global variables can make the logic of a web page.

► **Difficult to understand** ► Easier to understand and maintain

► Difficult to reuse and maintain ► Difficult to understand, reuse and maintain

Question No: 30 (Marks: 1) - Please choose one

In JavaScript: In order to display the text on browser **Grade A**, which of the following statement is True.

► document.write("Grade A") ► **document.write("Grade A");**

► document.write("Grade” && A"); ► document.write("Grade” && “A");

FINAL TERM EXAMINATION CS101- Introduction to Computing
(Session - 3) Question No: 1 (Marks: 1) - Please choose one

First computer network was _____.

► NSFNET ► FIRSTNET ► **ARPANET** ► ORPHANET

Question No: 2 (Marks: 1) - Please choose one

In a good presentation each slide should contain_____.

► **Heading** ► Phrases not sentences ► Sentences not phrases ► Heading, sentences not phrases

Question No: 3 (Marks: 1) - Please choose one

A function is also called _____.

► Subprogram ► Procedure ► Subroutine ► **All of the given option**

Question No: 4 (Marks: 1) - Please choose one

A single pixel can acquire approximately _____ color schemes.

► 1 million ► 2 million ► 10 million ► **16 million**

Question No: 5 (Marks: 1) - Please choose one

Which of the following is NOT a Loop statement?

https://www.vuhelpcorner.com

► For ► While ► **Switch** ► Do-While

Question No: 6 (Marks: 1) - Please choose one

Which one of the following is NOT a component of Rule Based

System?

► **Rule Compiler** ► Rule Interpreter ► Rules Base ► Working Memory **Question No: 7 (Marks: 1) - Please choose one**

Spreadsheet is a type of _____.

► **Productivity software** ► Engineering software ► Mathematical software ► Business software

Question No: 8 (Marks: 1) - Please choose one

A combination of word processing and graphic design is

► CorelDraw ► **Desktop Publishing** ► Paint ► WordPad

Question No: 9 (Marks: 1) - Please choose one

To store rounded number of 8.6 in a variable called "r_number", we write _____.

► r_numbers=Maths.rounds(8.6) ► r_number=Math.rounds(8.6)

► **r_number=Math.round(8.6)** ► r_number=Maths.round(8.6)

Question No: 10 (Marks: 1) - Please choose one

Which of the following is a true statement?

► Flat-file storage is better than tabular storage.

► **Tabular storage is better than flat-file storage.**

► Flat-file storage is better than relational storage.

► None of the given options

Question No: 11 (Marks: 1) - Please choose one

The political process is also influenced by the use of

_____.

► Discussion forums ► Newsgroups ► Mailing lists

► **All of the given options**

Question No: 12 (Marks: 1) - Please choose one

The system that manages relational database, is called _____.

► **None of the given options**

► Database Management System

► Data Management System

► Relational Database Management System

Question No: 13 (Marks: 1) - Please choose one

_____ DBMS supports data in terabytes.

► Personal ► Desktop ► **Enterprise** ► Single-user

Question No: 14 (Marks: 1) - Please choose one

Trinoo is a _____ software.

► **DoS** ► Scanning ► Utility ► None of the given options

Question No: 15 (Marks: 1) - Please choose one

What is the major problem with flash based website?

► **Its two heavy** ► Cannot be indexed ► Less attractive ► Inaccessible

Question No: 16 (Marks: 1) - Please choose one

The organization is the collection of _____.

► **Peoples** ► Professionals ► Teams ► Individuals

Question No: 17 (Marks: 1) - Please choose one

The tasks performed to determine the existence of defects is called _____

► Debugging ► **Testing** ► Repairing ► Coding

Question No: 18 (Marks: 1) - Please choose one

Many developers write the _____ first and then incrementally convert each line into _____.

► Real code & Pseudocode ► **Pseudocode & Real code**

► Real code & Artificial code ► None of the given options

Question No: 19 (Marks: 1) - Please choose one

Forms can be submitted through _____ & _____ methods

► INCLUDE, POST ► INCLUDE, GET

► **GET, POST** ► SEND, POST

Question No: 20 (Marks: 1) - Please choose one

If an algorithm is syntactically correct, but semantically incorrect then this situation is

► Very good situation ► **Very dangerous situation**

► Not very bad ► Neutral situation

Question No: 21 (Marks: 1) - Please choose one

Heuristics _____ lead to the best results.

► Sometimes ► Do not ► Occasionally ► **Not always**

Question No: 22 (Marks: 1) - Please choose one

In TCPIP communication fragmentation is responsibility of

► TCP ► IP ► **Both TCP and IP** ► Internet

Question No: 23 (Marks: 1) - Please choose one

Access to the internet became easier after the invention of

► **WWW & Web Browsers**

► Mainframes

► Binary system

► Signals

Question No: 24 (Marks: 1) - Please choose one

Which one is the example of spreadsheet software ?

► MS Word ► MS PowerPoint ► **MS Excel** ► MS Access

Question No: 25 (Marks: 1) - Please choose one

User can remotely log on to a computer and can have a control over it like a local user using

► TelNet Protocol

► **TelNet Protocol and connected to the user through TCP/IP network**

► TelNet protocol and FTP

► TCP/IP and FTP

Question No: 26 (Marks: 1) - Please choose one

If incorrectly we enter the negative age it is check by

► **Limit Integrity** ► Type Integrity ► Referential Integrity ► Physical Integrity

Question No: 27 (Marks: 1) - Please choose one

---------- is a digital programmable mechanical machine

► **Analytical Engine** ► Difference Engine ► Harvard Mark 1 ► Mechanical

engine

Question No: 28 (Marks: 1) - Please choose one

This element of FlowChart is called_____.

► Process ► **Off page connector** ► Decision ► Connector

Question No: 29 (Marks: 1) - Please choose one

In a library's database, if there is an entry in the register for Book # 423 then the corresponding Book must actually exist; is an example of which type of data integrity

► Type integrity ► Limit integrity ►Physical Integrity ►**Referential Integrity**

Question No: 30 (Marks: 1) - Please choose one

Ada is a programming language specifically designed for

► **Analytical Engine** ► Difference Engine ► Harvard Mark 1 ► Mechanical engine

FINAL TERM EXAMINATION CS101- Introduction to Computing

(Session - 1) Question No: 1 (Marks: 1) - Please choose one Cray-1 was first commercial _____ computer

► **Super** ► Mini ► Micro ► Personal

Question No: 2 (Marks: 1) - Please choose one

The name of the first browser was

_____

► **Internet Explorer** ► Mosaic ► Netscape ► Firefox

Question No: 3 (Marks: 1) - Please choose one

The impact of a digit in a number is determined by its ----------

► Value ► Location ► **Length** ► None of above

Question No: 4 (Marks: 1) - Please choose one

First computer network was

_____.

► NSFNET ► FIRSTNET ► **ARPANET** ► ORPHANET

Question No: 5 (Marks: 1) - Please choose one

A variable can be _____ in

scope.

► Local ► Global ► **Either local or global**

► None of the given options

Question No: 6 (Marks: 1) - Please choose one

_____ color should be used in background for a good presentation.

► Light ► **Dark** ► Red ► None of the given options

Question No: 7 (Marks: 1) - Please choose one

Which one of the following is not an event handler's attribute?

► Function ► Identifier ► Equal sign

► **String consisting of JavaScript statements**

Question No: 8 (Marks: 1) - Please choose one

Variables allow us to manipulate data through the _____.

► Actual Value ► Reference ► **Length** ► Name

Question No: 9 (Marks: 1) - Please choose one

Which one of the following is NOT a component of Rule Based System?

► Rule Compiler ► Rule Interpreter ► Rules Base ► **Working Memory**

Question No: 10 (Marks: 1) - Please choose one

Fuzzy logic is based on _____.

► Ground facts ► Experience ► Practice ► **Approximation**

Question No: 11 (Marks: 1) - Please choose one

a = Math.ceil(12.01)

What will be the value of a ?

► **12** ► 13 ► 12.0 ► 13.01

Question No: 12 (Marks: 1) - Please choose one

Tag used to make a Text Bold is

_____

► <BOLD></BOLD> ► **<B></B>** ► <BODY></BODY> ► None of these

Question No: 13 (Marks: 1) - Please choose one

<P> </P> and
 tags are not same
because

► goes to the next
line

►
 goes to the next after next line

► **<P></P> goes to the next after next line**

► Both are
same

Question No: 14 (Marks: 1) - Please choose one

Event handlers are placed in the _____ portion of a Web page as attributes in HTML tags.

► HEAD ► **BODY** ► SCRIPT ► TITLE

Question No: 15 (Marks: 1) - Please choose one

Due to working at home, lack of interaction may result in _____ professional growth.

► **Slower** ► Faster ► Higher ► Improved

Question No: 16 (Marks: 1) - Please choose one

_____ DBMS supports data in
terabytes.

► Personal ► Desktop ► **Enterprise** ► Single-user

Question No: 17 (Marks: 1) - Please choose one

_____ waits for some time and then launch a
function.

► Timeout( ) ► **setTimeout( )** ► setTime( ) ► setTimeIn( )

Question No: 18 (Marks: 1) - Please choose one

The responsibilities of the Team Lead includes_____.

► Planning and tracking of the project

► Detailed
design

► Professional development of team members

► **All of the given options**

Question No: 19 (Marks: 1) - Please choose one

_____ is also known as System Architecture

► **High level system design**

► Low level system design

► Every system design

► Software Requirement

Question No: 20 (Marks: 1) - Please choose one

The key property of the 'Array' object in JavaScript is

► Value ► **Length** ► Name

► All of the given choices

Question No: 21 (Marks: 1) - Please choose one

There are _____ ways of calling functions.

► One ► **Two** ► Three ► Four

Question No: 22 (Marks: 1) - Please choose one

Which event handler executes the specified JavaScript code when a window/form element loses focus ?

► **onBlur** ► onLoad ► onUnload ► onFocus

Question No: 23 (Marks: 1) - Please choose one

Popular schemes used for reducing bytes for storage are:

► RGB and Color mapping

► RGB and Dithering

► RGB, Color mapping and Dithering

► **Color mapping and Dithering**

Question No: 24 (Marks: 1) - Please choose one

Hardware malfunctions is related to

► Data updates ► **Data integrity** ► Data security ► Data accessibility

Question No: 25 (Marks: 1) - Please choose one

Users communicate with the computer using a consistent user interface provided by the OS. ► **True** ► False

Question No: 26 (Marks: 1) - Please choose one

Extension for saving web page is / are;

► ***.html** ► *.htm ► *.html and *.htm both are in use

► None of These

Question No: 27 (Marks: 1) - Please choose one

_____ loop is a flow control statement that allows code to be executed repeatedly based on a given Boolean condition.

► For ► Do-While ► **If-else** ► While

Question No: 28 (Marks: 1) - Please choose one

onBlur event is occurred for a form element when it _____

► **Gets focus** ► Loses focus

► Some thing is typed in ► onBlur is not an event

Question No: 29 (Marks: 1) - Please choose one

```
<script>
Number=new Array(5);
for(var i=1; i<=5 ; i=i+1)
{
    for( var k=6; k<=10;
    k=k+1)
    {
        Number[i]= k*i; } } </script>
```

For how many times the Nested For Loop shall execute;

► 20
► 15
► 25
► Shall terminate in first loop.

Question No: 30 (Marks: 1) - Please choose one

In JavaScript: In order to display the text on browser **Grade A**, which of the following statement is True.

► document write("Grade A") ► document.write("Grade A");
► document.write("Grade" && A"); **► document.write("Grade" && "A");**

FINAL TERM EXAMINATION CS101-
Introduction to Computing (Session - 4)

Question No: 1 (Marks: 1) - Please choose one

Success of a website is defined by _____.

►**Use**► Designer ► Developer ► Programmer

Question No: 2 (Marks: 1) - Please choose one

Which one is correct for JavaScript?

► **onMouseOver** ► OnMouseOver ► onmouseover ► All of the given

Question No: 3 (Marks: 1) - Please choose one

An indexed list of elements is called _____.

► Collection ► **Array** ► Set ► Group

Question No: 4 (Marks: 1) - Please choose one

_____ is the way that internet domain names are located and translated into IP addresses.

► FTP ► VoIP ►**DNS** ► TCP

Question No: 5 (Marks: 1) - Please choose one

The browser breaks down the URL into _____ parts.

► 2 ►**3** ► 4 ► 5

Question No: 6 (Marks: 1) - Please choose one

Which one of the following is not an event handler's attribute?

► Function ► Identifier ► Equal sign

► String consisting of JavaScript statements

Question No: 7 (Marks: 1) - Please choose one

JavaScript Variables are

► Dynamically Typed ► Statically Typed

► Strong Typed ► None of the given options

Question No: 8 (Marks: 1) - Please choose one

Which of the following is NOT a Loop statement?

► For ► While **► Switch** ► Do-While

Question No: 9 (Marks: 1) - Please choose one

According to a popular heuristic, success is defined by _____.

► **The user** ► The builder ► Both user and builder ► None of the given options

Question No: 10 (Marks: 1) - Please choose one

Which one of the following is an application for artificial intelligence?

► **Robotic** ► Web Agent ► Decision Support System ► All of the given options

Question No: 11 (Marks: 1) - Please choose one

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Using only HTML we can create

► Dynamic web pages ►**Static web pages**

► Both Static and Dynamic pages

► None of these

Question No: 12 (Marks: 1) - Please choose one

The _____ is connected to all other modules of the microprocessor.

► **Control unit** ► Memory unit ► Floating Point unit ► Arithmetic and Logic unit

Question No: 13 (Marks: 1) - Please choose one

Which of the following is NOT a Relational DBMS software.

► Access ► FrontPage ► FileMaker Pro ► **SQL Server**

Question No: 14 (Marks: 1) - Please choose one

country=”Hello Pakistan”;
document.write(country.length); The output of the above statement is _____.

► 12 ► 13 ► 14 ► **15**

Question No: 15 (Marks: 1) - Please choose one

The distance among families is _____ because of spending more time on the internet.

► **Increased** ► Expanded ► Contracted ► Decreased

Question No: 16 (Marks: 1) - Please choose one

_____ is a field that uniquely identifies each record stored in a table.

► Composite Key ► **Primary key** ► Foreign key ► None of the given options

Question No: 17 (Marks: 1) - Please choose one

Planning and tracking of the project is the responsibility of the_____.

► Architect ► **Team Lead** ► Developer ► Chief Executive Officer

Question No: 18 (Marks: 1) - Please choose one

_____ has great PR skills.

► Architect ► Team Lead ► Project Manager ► **Chief Executive Officer**

Question No: 19 (Marks: 1) - Please choose one

_____ team is responsible for a project after the specification’s stage till the very end.

► Executive ► Architect ► **Development** ► HR

Question No: 20 (Marks: 1) - Please choose one

A large number of networks interconnected physically is called _____

► LAN ► **WAN** ► Internet ► Network collection

Question No: 21 (Marks: 1) - Please choose one

Efficiency is _____ to universality

► Equal ► **Direct proportional** ► Inversely proportional ► Not proportional

Question No: 22 (Marks: 1) - Please choose one

There are _____ ways of calling functions.

► One ► **Two** ► Three ► Four

Question No: 23 (Marks: 1) - Please choose one

Which protocol is used to transfer a file over the network?

► UDP ► **FTP** ► TCP ► OSI

Question No: 24 (Marks: 1) - Please choose one

Writing a response, multiple statements are separated from each other with the help of

► **Period (.)** ► Comma (,) ► Colon (:) ► Semicolon (;)

Question No: 25 (Marks: 1) - Please choose one

Popular schemes used for reducing bytes for storage are:

► RGB and Color mapping ► RGB and Dithering

► RGB, Color mapping and Dithering ► **Color mapping and Dithering**

Question No: 26 (Marks: 1) - Please choose one

_____ has the ability to automate and simplify daily tasks.

► Productivity software ► **Application software**

► System software ► Graphical software

Question No: 27 (Marks: 1) - Please choose one Which representation technique of algorithm is more suitable for developer to make actual code_____.

► **pseudo code** ► flow chart ► both pseudocode and flowchart ► Heuristics

Question No: 28 (Marks: 1) - Please choose one

_____ is used to terminate all JavaScript statements.

► Colon ► **Semicolon** ► Underscore ► Apostrophe

Question No: 29 (Marks: 1) - Please choose one

CONCATENATE operator is used to_____ elements.

► Subtract ► Multiply ► **Join** ► Add

Question No: 30 (Marks: 1) - Please choose one

In partitioning of program/module, it should be assured that partitioned chunks should be as _____ as possible.

► Dependent ► **Independent** ► Complex ► All of the abov

FINAL TERM EXAMINATION CS101-
Introduction to Computing (Session - 3)

Question No: 1 (Marks: 1) - Please choose one

The memory size of the Altair 8800 was

► 128 bytes ► 128 Kilobytes ► **256 Kilobytes** ► 256 bytes

Question No: 2 (Marks: 1) - Please choose one

Hexadecimal number system is based on ---------- digits

► 2 ► 8 ► 12 ► **16**

Question No: 3 (Marks: 1) - Please choose one

Which one of the following is not an event handler's attribute?

► Function ► Identifier ► Equal sign

► **String consisting of JavaScript statements**

Question No: 4 (Marks: 1) - Please choose one

Which is correct?

► **onUnload** ► onUnLoad ► onUNLOAD ► All of the above

Question No: 5 (Marks: 1) - Please choose one

The most upper right pixel of the screen is of _____ color.

► **Any** ► Red ► Green ► Blue

Question No: 6 (Marks: 1) - Please choose one

Which of the following is NOT a Loop statement?

► For ► While ► **Switch** ► Do-While

Question No: 7 (Marks: 1) - Please choose one

When '+' operator is used with string operands, it _____ both strings.

► **Adds** ► Subtracts ► Concatenates ► Compares

Question No: 8 (Marks: 1) - Please choose one

_____ organization is replacing the old-style layered, tree-structured organizational model.

► Network ► Hierarchical ► Matrix ► **None of the given options**

Question No: 9 (Marks: 1) - Please choose one

Due to working at home, lack of interaction may result in _____ professional growth.

Slower Faster Higher Improved

Question No: 10 (Marks: 1) - Please choose one

Spies of one business monitoring the network traffic of their competitors' _____.

Industrial Intelligence Industrial Espionage Industrial Spying Industrial Surveillance

Question No: 11 (Marks: 1) - Please choose one

The key responsibilities of a project manager is _____.

Planning and tracking of the project Arranging of the appropriate resources Client relationship management **All of the given options**

Question No: 12 (Marks: 1) - Please choose one

Sequence of steps that is taken to solve a problem is called _____.

Algorithm Operating System Application software None of the given options

Question No: 13 (Marks: 1) - Please choose one

CELLPADDING determines the distance between the _____ of the cell and the contents of the cell Caption **Border** Alignment Empty space

Question No: 14 (Marks: 1) - Please choose one

DSS stands for:

Dual System Security Decision Support System Digital System Solver **Dynamic System Security**

Question No: 15 (Marks: 1) - Please choose one

Flow control constructs in JavaScript includes:

If-Else Loops and If -Else **Switch and If-Else** All of the given choices

Question No: 16 (Marks: 1) - Please choose one

Assignment operator in JavaScript is represented by:

= **= =** => >=

Question No: 17 (Marks: 1) - Please choose one

In a System having many parts to be designed, one should always do the _____ first

Hard part Simple part Development part Quality part

Question No: 18 (Marks: 1) - Please choose one

Which protocol is used to send email ?

FTP **SMTP** TELNET All of the given choices

Question No: 19 (Marks: 1) - Please choose one

Those Systems are “Intelligent System” that mimics some aspects of

Software deployment **Human thought** Speaking power Computing

Question No: 20 (Marks: 1) - Please choose one

```
<script> Number=new Array(5);for(var
i=1; i<=5 ; i=i+1) {
for( var k=6; k<=10;
k=k+1)
{
Number[i]= k*i;
} } </script>
```

For how many times the Nested For Loop shall execute;

20 15 25 **Shall terminate in first loop.**

Question No: 21 (Marks: 1) - Please choose one

Which of the following is a valid html tag?

► <html> ► <HTML> ► <htML> **► All of the above**

Question No: 22 (Marks: 1) - Please choose one

Which of the following memory retains its information when the power to the system is turned off?

► RAM ► **ROM** ► DIMM ► DRAM

Question No: 23 (Marks: 1) - Please choose one

The output of **document.write("2" + Math.PI) ; is_____.**

► 23.141592653589793 ► 3.146 ► 2.3141592653589793 ► **None of them**

Question No: 24 (Marks: 1) - Please choose one

Logic Bombs executes its payload when _____

► A programs run

► A predetermined event occurs

► DoS attack is launched

► **A file is copied from one folder to another**

Question No: 25 (Marks: 1) - Please choose one

Which Internet Service is comparatively Slow but Inexpensive and Fast.

► **E-mail** ► Instant Messaging ► Web ► None of the given

Question No: 26 (Marks: 1) - Please choose one

Super computers consists of more than one parallel processors because

► One big processor is more expensive than parallel processors

► **Through parallel processors problems can be solved easily**

► Small processors are easy to manufacture

► All of the given

Introduction to Computing (Session - 2)

Question No: 1 (Marks: 1) - Please choose one

A procedure that usually, but not always, works or that gives nearly the right answer is called

► Algorithm ► Logarithm ► **Heuristic** ► Methodology

Question No: 2 (Marks: 1) - Please choose one

Which of the following is NOT an Application Software?

► Word Processor ► Web Browser ► **Windows XP** ► MS Excel

Question No: 3 (Marks: 1) - Please choose one

Operating System talks to and manages devices through

► Loader ► File Manager ► Memory Manager ► **Device Driver**

Question No: 4 (Marks: 1) - Please choose one

You can _____ from/to a website containing interactive forms.

► Only read ► Only write ► **Read and write** ► Not read and write

Question No: 5 (Marks: 1) - Please choose one

When the user needs something to be done by the computer, he/she gives instructions in the form of _____ to computer ____

► **Software, Hardware** ► Hardware, Software

► System Software, Application Software ► Graph, Monitor

Question No: 6 (Marks: 1) - Please choose one

There is a battery on the motherboard to:

► Give power to the processor ► **Save information when computer is off**

► Save information when computer is on ► Give power to the

motherboard

Question No: 7 (Marks: 1) - Please choose one

_____ is simply a fast port that lets you connect computer peripherals and consumer electronics to your computer without restart.

► Freeware ► Shareware ► **Firewire** ► Firmware

Question No: 8 (Marks: 1) - Please choose one

Which one is correct?

► <BODY></BODY> ► <body></body>

► **Both <BODY></BODY> and <body></body>** ► <BODY/>

Question No: 9 (Marks: 1) - Please choose one

The weaknesses of the computer are:

► Pattern recognition & Storage ► Speed & Innovative ideas

► **Pattern recognition & Innovative ideas** ► Speed & Storage

Question No: 10 (Marks: 1) - Please choose one

The key strengths of computers are

► Speed ► Storage ► Do not get bored ► **All of the given choices**

Question No: 11 (Marks: 1) - Please choose one

Which one is correct?

► **<HEAD> </HEAD>** ► <HEAD> <END>

► <HEAD> </END> ► <HEAD> <\HEAD>

Question No: 12 (Marks: 1) - Please choose one

Everything that JavaScript manipulates is treated as:

► **Object** ► Window ► Text ► Script

Question No: 13 (Marks: 1) - Please choose one

A process in which user's browser check the form's data is called

► Server-Side Scripting ► **Client-Side Scripting**

► Bowser Scripting ► Form Scripting

Question No: 14 (Marks: 1) - Please choose one

---------- is volatile memory

► **RAM** ► ROM ► Hard Disk ► CD ROM

Question No: 15 (Marks: 1) - Please choose one

WYSIWYG stands for

► What you say is what you get ► Where you see is where you go

► **What you see is what you get** ► When you see is when you get

Question No: 16 (Marks: 1) - Please choose one

What is/are the use/uses of Word processor?

► To write a letter ► To write Research paper or report

► To create address labels ► **All of the given**

Question No: 17 (Marks: 1) - Please choose one

_____ is the example of Shrink-wrapped software

► PIA information system ► WinZip trial pack ► Linux ► **MS Word**

Question No: 18 (Marks: 1) - Please choose one

_____ interacts directly with the computer

Hardware

► Compiler ► **Operating system** ► Application software ► Assembler

Question No: 19 (Marks: 1) - Please choose one

Which of the following symbol is used for multiple line comments in JavaScript?

► / ► **//** ► **/*** ► //*

Question No: 20 (Marks: 1) - Please choose one

Consider the following statement written in JavaScript: str = ”Hello” + ” World”

What will be the value of str ?

► **HelloWorld** ► Hello World ► Hello + World ► It will result in error

Question No: 21 (Marks: 1) - Please choose one

_____ give us the ability to manipulate data through reference instead of actual value.

► **Constants** ► **Variables** ► Data Types ► Operators

Question No: 22 (Marks: 1) - Please choose one

Bringing subsystems together to form the system is called

► **Integration** ► Merging ► Splitting ► Operation & Maintenance

Question No: 23 (Marks: 1) - Please choose one

Preliminary exploration of possible solutions, technologies, suppliers is called

► Viability ► **Feasibility** ► Specification ► Integration

Question No: 24 (Marks: 1) - Please choose one

Algorithm gives us:

► Definition of a problem ► **Sequence of steps to solve a problem**

► Proper understanding of a problem ► Solution to a problem

Question No: 25 (Marks: 1) - Please choose one

Web site is collection of related _____

► Web pages ► **Information** ► Search Engines ► None of the given choices

Question No: 26 (Marks: 1) - Please choose one

Information on World Wide Web is _____ unified.

► Physically ► **Logically** ► Really ► None of the given choices

FINAL TERM EXAMINATION Fall 2008

CS101- Introduction to Computing (Session - 2)

Question No: 1 (Marks: 1) - Please choose one

Which function returns a randomly selected floating point number between 0 and 1 ?

► floor(x) ► ceil(x) ► **random()** ► round(x)

Question No: 2 (Marks: 1) - Please choose one

Functions are also called:

► Heuristics ► Variables ► Arrays ► **Subprograms**

Question No: 3 (Marks: 1) - Please choose one

In JavaScript, each element of the array can store data of type

► A Number ► An Array ► A String variable ► **All of the given choices**

Question No: 4 (Marks: 1) - Please choose one

The weaknesses of the computer are:

► Pattern recognition & Storage ► Speed & Innovative ideas

► **Pattern recognition & Innovative ideas** ► Speed & Storage

Question No: 5 (Marks: 1) - Please choose one

Processed data is called _____.

► **Information** ► Data ► Entity ► Attribute

Question No: 6 (Marks: 1) - Please choose one

Many developers write the _____ first and then incrementally convert each line into _____.

► Real code & Pseudocode ► **Pseudocode & Real code**

► Real code & Artificial code ► **None of the given options**

Question No: 7 (Marks: 1) - Please choose one

When we buy a software package, we do not really buy it, we just by a license that allows us to use it, the _____stays with the maker.

► Agreement ► **Ownership** ► Membership ► Software

Question No: 8 (Marks: 1) - Please choose one

Name, Border, Source are the _____ of the image object.

► Event Handler ► **Properties** ► Methods ► None of the given options

Question No: 9 (Marks: 1) - Please choose one

Using smart editors they can automatically color different parts of statements in different colors e.g. HTML tags in _____ color.

► Green ► Grey ► **Blue** ► None of the given options

Question No: 10 (Marks: 1) - Please choose one

_____ is in Executive team.

► **Project Manager** ► CEO ► Team Lead ► Developer

Question No: 11 (Marks: 1) - Please choose one

Module level design and unit testing the responsibility of _____.

► Team Lead ► **Developer** ► Project Manager ► Quality Assurance Expert

Question No: 12 (Marks: 1) - Please choose one

_____ team is responsible for a project after the specification's stage till the very end.

► Executive ► Architect ► **Development** ► HR

Question No: 13 (Marks: 1) - Please choose one

_____ waits for some time and then launch a function.

► Timeout( ) ► **setTimeout( )** ► setTime( ) ► setTimeIn( )

Question No: 14 (Marks: 1) - Please choose one

Which of the following is NOT an event handler for image object?

► onAbort ► onError ► onLoad ► **onUser**

Question No: 15 (Marks: 1) - Please choose one

_____ is a field that uniquely identifies each record stored in a table.

► Composite Key ► **Primary key** ► Foreign key ► None of the given options

Question No: 16 (Marks: 1) - Please choose one

Distance learning has got a boost due to the _____.

► Easy communication ► Online interactive contents ► Flexibility

► **All of the given options**

Question No: 17 (Marks: 1) - Please choose one

By default in a web page Hyper Link for another web page is represented as _____

► Blue only ► Black and Underlined ► Blue and Bold ► **Blue and Underlined** Question No: 18 (Marks: 1) - Please choose one

To store rounded number of 8.6 in a variable called "r_number", we write _____.

► r_number=Maths.round(8.6) ► r_numbers=Maths.rounds(8.6)

► r_number=Math.rounds(8.6) ► **r_number=Math.round(8.6)**

Question No: 19 (Marks: 1) - Please choose one

Which one is the best option for designing a Medical Expert System?

► **Rule Based System** ► Genetic Algorithm ► Fuzzy Logic ► Neural Network

Question No: 20 (Marks: 1) - Please choose one

Variables allow us to manipulate data through the _____.

► Actual Value ► **Reference** ► Length ► Name

Question No: 21 (Marks: 1) - Please choose one

Which is correct?

► **onUnload** ► onUnLoad ► onUNLOAD ► All of the above

Question No: 22 (Marks: 1) - Please choose one

Capturing events and responding to them is called _____.

► Function Handling ► **Event Handling** ► Event Procedure ► All of the given option

Question No: 23 (Marks: 1) - Please choose one

_____ color should be used in background for a good presentation.

► Light ► **Dark** ► Red ► None of the given options

Question No: 24 (Marks: 1) - Please choose one

Which of the following symbol is used for multiple line comments in JavaScript?

► / ► // ► **/*** ► //*

Question No: 25 (Marks: 1) - Please choose one

In JavaScript, what will be the result of the follwoing operation 79%3

► 0 ► **1** ► 2 ► 3

Question No: 26 (Marks: 1) - Please choose one

A new cell using HTML is added in table row by

► <TC>...</TC> ► **<TR>...</TR>**

► <TD>...</TD> ► <NC>...</NC>

Question No: 27 (Marks: 1) - Please choose one

TCP stands for _____.

► Total communication protocol ► **Transmission control protocol**

► Transfer control protocol ► Transfer collection protocol

Question No: 28 (Marks: 1) - Please choose one

What is NOT a key factor while designing a website?

► Usability ► User-friendly ► Consistency ► **Complexity**

Question No: 29 (Marks: 1) - Please choose one

It represents the _____ flow chart element.

► Process ► **Input or Output** ► Decision ► Connector

Question No: 30 (Marks: 1) - Please choose one

Vacuum tubes were replaced by ___

► Punch cards ► **Transistors** ► Micro Processors ► Resistors

FINALTERM EXAMINATION Spring 2009

Final CS101- Introduction to Computing

(Session - 2)

The transistor is a solid state semiconductor device used for amplification and switching, and has __three_____ terminals.

► one ► two ► **three** ► four

Question No: 2 (Marks: 1) - Please choose one

Blue Pacific is a name of ____Super__ computer.

► Mini ► Desktop ► Micro ► **Super**

Question No: 3 (Marks: 1) - Please choose one Monte Carlo algorithm is an example of Randomized algorithm

► **Randomized algorithm** ► Greedy algorithm

► both greedy and randomized ► Heuristics

Question No: 4 (Marks: 1) - Please choose one A set of stand alone productivity applications designed to work together known as __ Productivity software suites .

► **Productivity software suites** ► Compiled software
► Secure software ► Intelligent software

Question No: 5 (Marks: 1) - Please choose one
The most used form tag is the <input> tag. - False
► True ► **False**

Question No: 6 (Marks: 1) - Please choose one What is the key feature of computer which is against human nature? Can't get bored.

► **Can't get bored**. ► Pattern recognition ► Repetition ► None

Question No: 7 (Marks: 1) - Please choose one ___ Word Processor Software __ was designed as a replacement for typewriter
► Spreadsheet Software ► **Word Processor Software**
► Presentation Software ► Database Software

Question No: 8 (Marks: 1) - Please choose one Forms can be submitted by using _____2____ different methods
► **2** ► 3 ► 4 ► 5

Question No: 9 (Marks: 1) - Please choose one To display a checkbox on the web page, we use __INPUT_ tag
► CHECKBOX ► CHECK ► **INPUT** ► INPUTBOX

Question No: 10 (Marks: 1) - Please choose one _Name __ attribute of FORM tag is used to mention a URL when the form is being submitted
► **name** ► action ► method ► submit

Question No: 11 (Marks: 1) - Please choose one You can __ _____ from/to a website containing interactive forms.

► Only read ► Only write **► Read and write** ► Not read and write

Question No: 12 (Marks: 1) - Please choose one Using COLSPAN, number of rows of the current cell should extend itself None of the given choices

► Upward **► Downward**

► Both Upward and Downward ► None of the given choices

Question No: 13 (Marks: 1) - Please choose one ASCII WHITE is the fastest Super computer which can perform _1.3 trillion__ calculations in one second.

► 1.3 billion **► 1.3 trillion** ► 1.3 miillion ► 1.3 thousand

Question No: 14 (Marks: 1) - Please choose one _HTML___ is a related collection of WWW files that includes a beginning file called a homepage

► HTML ► Website ► HTTP ► Web page

Question No: 15 (Marks: 1) - Please choose one If a computer could pass the Turing test then it would be able to: think like human beings

► think like human beings ► do the things faster

► win a million dollar prize► store more information

Question No: 16 (Marks: 1) - Please choose one
The key strengths of computers are - Speed

► Speed ► Storage ► Do not get bored **► All of the given choices**

Question No: 17 (Marks: 1) - Please choose one Compared to vacuum tubes, Transistors offer: All of the given choices

► Much smaller size ► Better reliability

► Much lower cost **► All of the given choices**

Question No: 18 (Marks: 1) - Please choose one Which of the following is NOT a component of IC? Resistors

► Transistors ► Diodes **► Resistors** ► Vacuum tubes

Question No: 19 (Marks: 1) - Please choose one When we use <INPUT type=“password”>, what will happen? - Text will be in **** format

► Text will not be visible ► Text will be in normal format

► **Text will be in **** format** ► Text will be in #### format

Question No: 20 (Marks: 1) - Please choose one Spread
sheet is a type of _ Mathematical software _____.
► Productivity software ► Engineering software
► **Mathematical software** ► Business software

Question No: 21 (Marks: 1) - Please choose one
Word Processor is a ____ Application Software__
► System Software ► **Application Software** ► Device ► Utility

Question No: 22 (Marks: 1) - Please choose one _ Utility Program refers to the firmware code which is run by an IBM compatible PC when first powered on. ► DOS ► BIOS ► **Utility Program** ► None of these

Question No: 23 (Marks: 1) - Please choose one A computer program that facilitates the communication between the computer and a peripheral device is called____ Language Translator _____
► Operating system ► Utilities ► **Language Translator** ► Device Drives

Question No: 24 (Marks: 1) - Please choose one In JavaScript,
what will be the result of the following operation 79%3
► 0 ► 1 ► 2 ► **3**

Question No: 25 (Marks: 1) - Please choose one Which of the following
number system is used by microprocessor? Binary
► **Binary** ► Decimal ► Octal ► Hexadecimal

Question No: 26 (Marks: 1) - Please choose one
Web site is a collection of related ___
Information___
► Web pages ►**Information** ► Search Engines ► None of the given choices

vulmshelp.com

Module 134

73. Software Engineering: Software Engineering Methodologies (II)

A key point is that to modify software one must understand the program or at least the pertinent parts of the program. Gaining such an understanding is often difficult enough in the case of small programs and would be close to impossible when dealing with large software systems if it were not for **modularity** that is, the division of software into manageable units, generically called **modules,** each of which deals with only a part of the software's overall responsibility.

Modules come in a variety of forms. We have already seen that in the context of the imperative paradigm, modules appear as functions. In contrast, the object-oriented paradigm uses objects as the basic modular constituents. These distinctions are important because they determine the underlying goal during the initial software design process. Is the goal to represent the overall task as individual, manageable processes or to identify the objects in the system and understand how they interact?

To illustrate, let us consider how the process of developing a simple modular program to simulate a tennis game might progress in the imperative and the object-oriented paradigms. In the imperative paradigm we begin by considering the actions that must take place. Because each volley begins with a player serving the ball, we might start by considering a function named Serve that (based on the player's characteristics and perhaps a bit of probability) would compute the initial speed and direction of the ball. Next, we would need to determine the path of the ball (Will it hit the net? Where will it bounce?). We might plan on placing these computations in another function named ComputePath. The next step might be to determine if the other player is able to return the ball, and if so, we must compute the ball's new speed and direction. We might plan on placing these computations in a function named Return.

Continuing in this fashion, we might arrive at the modular structure depicted by the **structure chart** shown in Figure 99, in which functions are represented by rectangles and function dependencies (implemented by function calls) are represented by arrows. In particular, the chart indicates that the entire game is overseen by a function named ControlGame, and to perform its task, ControlGame calls on the services of the functions Serve, Return, ComputePath, and UpdateScore.

Note that the structure chart does not indicate how each function is to perform its task. Rather, it merely identifies the functions and indicates the dependencies among the functions. In reality, the function ControlGame might perform its task by first calling the Serve function, then repeatedly calling on the functions ComputePath and Return until one reports a miss, and finally calling on the services of UpdateScore before repeating the whole process by again calling on Serve.

At this stage we have obtained only a very simplistic outline of the desired program, but our point has already been made. In accordance with the imperative paradigm, we have been designing the program by considering the activities that must be performed and are therefore obtaining a design in which the modules are functions.

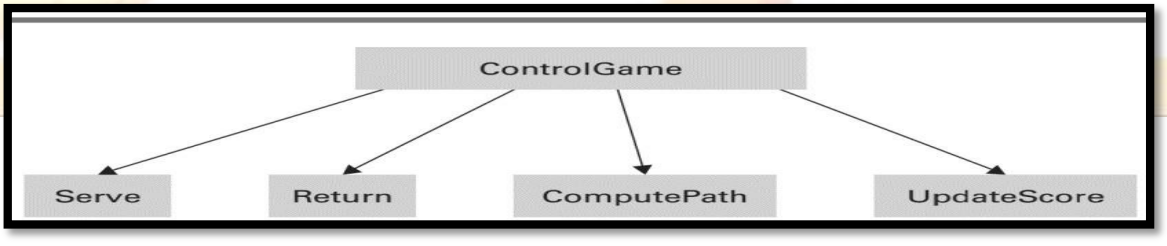


Figure 99: A simple structure chart

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Module 135

74. Software Engineering: Coupling

We have introduced modularity as a way of producing manageable software. The idea is that any future modification will likely apply to only a few of the modules, allowing the person making the modification to concentrate on that portion of the system rather than struggling with the entire package. This, of course, depends on the assumption that changes in one module will not unknowingly affect other modules in the system. Consequently, a goal when designing a modular system should be to maximize independence among modules or, in other words, to minimize the linkage between modules (known as intermodule **coupling**). Indeed, one metric that has been used to measure the complexity of a software system (and thus obtain a means of estimating the expense of maintaining the software) is to measure its intermodule coupling.

Intermodule coupling occurs in several forms. One is **control coupling,** which occurs when a module passes control of execution to another, as in a function call. The structure chart in Figure 99 represents the control coupling that exists between functions. In particular, the arrow from the module ControlGame to Serve indicates that the former passes control to the latter. It is also control coupling that is represented in Figure 100, where the arrows trace the path of control as it is passed from object to object.

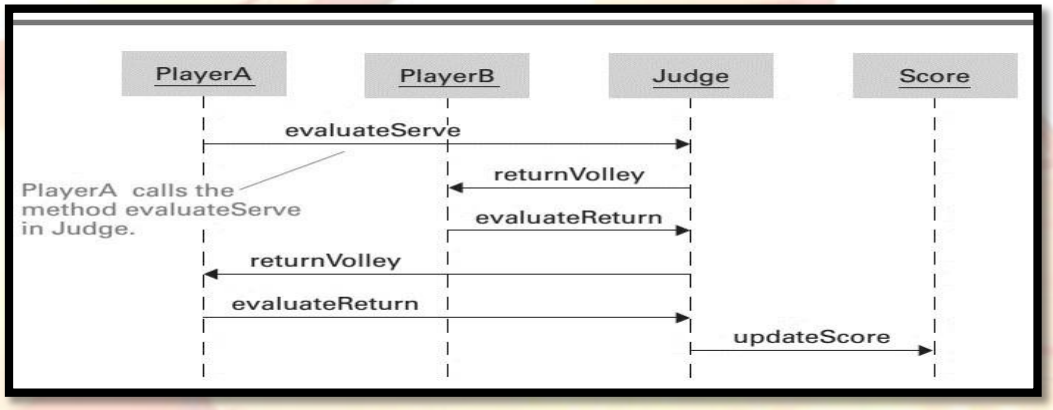


Figure 100: The interaction between objects resulting from PlayerA's serve.

Another form of intermodule coupling is **data coupling,** which refers to the sharing of data between modules. If two modules interact with the same item of data, then modifications made to one module may affect the other, and modifications to the format of the data itself could have repercussions in both modules.

Data coupling between functions can occur in two forms. One is by explicitly passing data from one function to another in the form of parameters. Such coupling is represented in a structure chart by an arrow between the functions that is labeled to indicate the data being passed. The direction of the arrow indicates the direction in which the item is transferred.

Similar data coupling occurs between objects in an object-oriented design. For example, when PlayerA asks the object Judge to evaluate its serve (see Figure 100), it must pass the trajectory information to Judge. On the other hand, one of the benefits of the object-oriented paradigm is that it inherently tends to reduce data coupling between objects to a minimum. This is because the methods within an object tend to include all those functions that manipulate the object's internal data. For example, the object PlayerA will contain information regarding that player's characteristics as well as all the methods that require that information. In turn, there is no need to pass that information to other objects and thus interobject data coupling is minimized.

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In contrast to passing data explicitly as parameters, data can be shared among modules implicitly in the form of **global data,** which are data items that are automatically available to all modules throughout the system, as opposed to local data items that are accessible only within a particular module unless explicitly passed to another. Most high-level languages provide ways of implementing both global and local data, but the use of global data should be employed with caution. The problem is that a person trying to modify a module that is dependent on global data may find it difficult to identify how the module in question interacts with other modules. In short, the use of global data can degrade the module's usefulness as an abstract tool.

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Module 136

75. Software Engineering: Cohesion

Just as important as minimizing the coupling between modules is maximizing the internal binding within each module. The term **cohesion** refers to this internal binding or, in other words, the degree of relatedness of a module's internal parts. To appreciate the importance of cohesion, we must look beyond the initial development of a system and consider the entire software life cycle. If it becomes necessary to make changes in a module, the existence of a variety of activities within it can confuse what would otherwise be a simple process. Thus, in addition to seeking low intermodule coupling, software designers strive for high intramodule cohesion. A weak form of cohesion is known as **logical cohesion.** This is the cohesion within a module induced by the fact that its internal elements perform activities logically similar in nature. For example, consider a module that performs all of a system's communication with the outside world. The "glue" that holds such a module together is that all the activities within the module deal with communication. However, the topics of the communication can vary greatly. Some may deal with obtaining data, whereas others deal with reporting results.

A stronger form of cohesion is known as **functional cohesion,** which means that all the parts of the module are focused on the performance of a single activity. In an imperative design, functional cohesion can often be increased by isolating subtasks in other modules and then using these modules as abstract tools. This is demonstrated in our tennis simulation example (see again Figure 99) where the module ControlGame uses the other modules as abstract tools so that it can concentrate on overseeing the game rather than being distracted by the details of serving, returning, and maintaining the score.

In object-oriented designs, entire objects are usually only logically cohesive because the methods within an object often perform loosely related activities—the only common bond being that they are activities performed by the same object. For example, in our tennis simulation example, each player object contains methods for serving as well as returning the ball, which are significantly different activities. Such an object would therefore be only a logically cohesive module. However, software designers should strive to make each individual method within an object functionally cohesive. That is, even though the object in its entirety is only logically cohesive, each method within an object should perform only one functionally cohesive task (Figure 101).

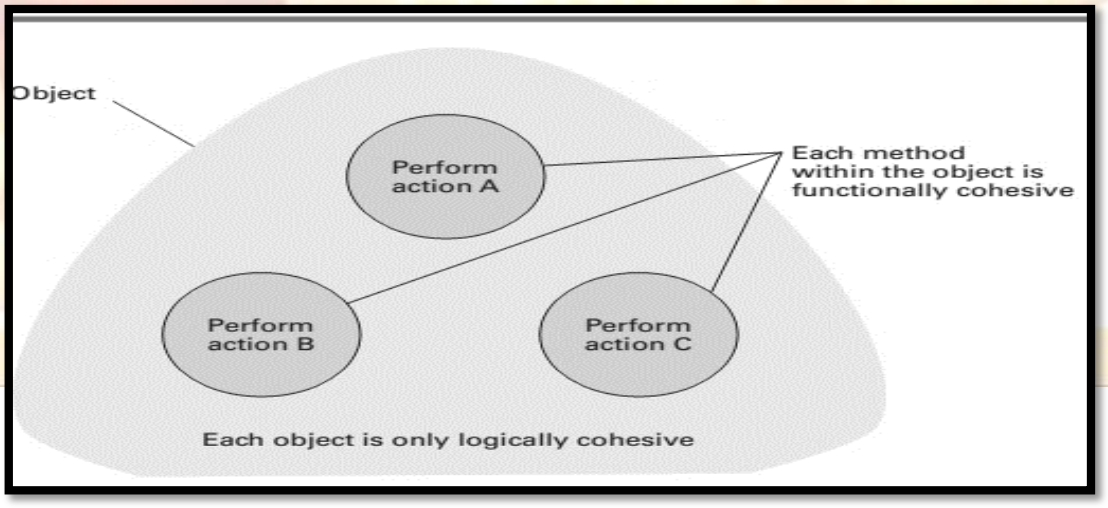


Figure 101: Logical and functional cohesion within an object

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Module 137

76. Software Engineering: Information Hiding

One of the cornerstones of good modular design is captured in the concept of **information hiding,** which refers to the restriction of information to a specific portion of a software system. Here the term *information* should be interpreted in a broad sense, including any knowledge about the structure and contents of a program unit. As such, it includes data, the type of data structures used, encoding systems, the internal compositional structure of a module, the logical structure of a procedural unit, and any other factors regarding the internal properties of a module. The point of information hiding is to keep the actions of modules from having unnecessary dependencies or effects on other modules. Otherwise, the validity of a module may be compromised, perhaps by errors in the development of other modules or by misguided efforts during software maintenance. If, for example, a module does not restrict the use of its internal data from other modules, then that data may become corrupted by other modules. Or, if one module is designed to take advantage of another's internal structure, it could malfunction later if that internal structure is altered.

It is important to note that information hiding has two incarnations—one as a design goal, the other as an implementation goal. A module should be designed so that other modules do not need access to its internal information, and a module should be implemented in a manner that reinforces its boundaries. Examples of the former are maximizing cohesion and minimizing coupling. Examples of the latter involve the use of local variables, applying encapsulation, and using well- defined control structures.

Finally we should note that information hiding is central to the theme of abstraction and the use of abstract tools. Indeed, the concept of an abstract tool is that of a "black box" whose interior features can be ignored by its user, allowing the user to concentrate on the larger application at hand. In this sense then, information hiding corresponds to the concept of sealing the abstract tool in much the same way as a tamperproof enclosure can be used to safeguard complex and potentially dangerous electronic equipment. Both protect their users from the dangers inside as well as protect their interiors from intrusion from their users.

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Module 138

77. Software Engineering: Components

We have already mentioned that one obstacle in the field of software engineering is the lack of prefabricated "off-the-shelf" building blocks from which large software systems can be constructed. The modular approach to software development promises hope in this regard. In particular, the object-oriented programming paradigm is proving especially useful because objects form complete, self-contained units that have clearly defined interfaces with their environments. Once an object, or more correctly a class, has been designed to fulfill a certain role, it can be used to fulfill that role in any program requiring that service. More- over, inheritance provides a means of refining prefabricated object definitions in those cases in which the definitions must be customized to conform to the needs of a specific application. It is not surprising, then, that the object-oriented programming languages C++, Java, and C# are accompanied by collections of prefabricated "templates" from which programmers can easily implement objects for performing certain roles. In particular, C++ is associated with the C++ Standard Template Library, the Java programming environment is accompanied by the Java Application Programmer Interface (API), and C# programmers have access to the .NET Framework Class Library.

The fact that objects and classes have the potential of providing prefabricated building blocks for software design does not mean that they are ideal. One problem is that they provide relatively small blocks from which to build. Thus, an object is actually a special case of the more general concept of a **component,** which is, by definition, a reusable unit of software. In practice, most components are based on the object-oriented paradigm and take the form of a collection of one or more objects that function as a self-contained unit.

Research in the development and use of components has led to the emerging field known as **component architecture** (also known as component-based software engineering) in which the traditional role of a programmer is replaced by a **component assembler** who constructs software systems from prefabricated components that, in many development environments, are displayed as icons in a graphical interface. Rather than be involved with the internal programming of the components, the methodology of a component assembler is to select pertinent components from collections of predefined components and then connect them, with minimal customization, to obtain the desired functionality. Indeed, a property of a well-designed component is that it can be extended to encompass features of a particular application without internal modifications.

An area where component architectures have found fertile ground is in smartphone systems. Due to the resource constraints of these devices, applications are actually a set of collaborating components, each of which provides some discrete function for the application. For example, each display screen within an application is usually a separate component. Behind the scenes, there may exist other service components to store and access information on a memory card, perform some continuous function (such as playing music), or access information over the Internet. Each of these components is individually started and stopped as needed to service the user efficiently; however, the application appears as a seamless series of displays and actions.

Aside from the motivation to limit the use of system resources, the component architecture of smartphones pays dividends in integration between applications. For example, Facebook (a well-known social networking system) when executed on a smartphone may use the components of the contacts application to add all Facebook friends as contacts. Furthermore, the telephony application (the one that handles the functions of the phone), may also access the contacts' components to lookup the caller of an incoming call. Thus, upon receiving a call from a Facebook friend, the friend's picture can be displayed on the phone's screen (along with his or her last Facebook post).

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Module 139

78. Software Engineering: Design Patterns

An increasingly powerful tool for software engineers is the growing collection of design patterns. A **design pattern** is a pre-developed model for solving a recurring problem in software design. For example, the Adapter pattern provides a solution to a problem that often occurs when constructing software from prefabricated modules. In particular, a prefabricated module may have the functionality needed to solve the problem at hand but may not have an interface that is compatible with the current application. In such cases the Adapter pattern provides a standard approach to "wrapping" that module inside another module that translates between the original module's interface and the outside world, thus allowing the original, prefabricated module to be used in the application.

Another well-established design pattern is the Decorator pattern. It provides a means of designing a system that performs different combinations of the same activities depending on the situation at the time. Such systems can lead to an explosion of options that, without careful design, can result in enormously complex software. However, the Decorator pattern provides a standardized way of implementing such systems that leads to a manageable solution.

The identification of recurring problems as well as the creation and cataloging of design patterns for solving them is an ongoing considerations of good design principles such as minimizing coupling and maximizing cohesion play an important role in the development of design patterns.

The results of progress in design pattern development are reflected in the library of tools provided in today's software development packages such as the Java programming environments provided by Oracle and the .NET Framework provided by Microsoft. Indeed, many of the templates found in these tool kits are essentially design pattern skeletons that lead to ready-made, high-quality solutions to design problems.

In closing, we should mention that the emergence of design patterns in software engineering is an example of how diverse fields can contribute to each other. The origins of design patterns lie in the research of Christopher Alexander in traditional architecture. His goal was to identify features that contribute to high-quality architectural designs for buildings or building complexes and then to develop design patterns that incorporated those features. Today, many of his ideas have been incorporated into software design and his work continues to be an inspiration for many software engineers process in software engineering.

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Module 140

79. Software Engineering: Design Patterns Examples

Factory design Pattern:

The Factory Design Pattern (Figure 102) is a commonly used design pattern where we need to create Loosely Coupled System. Basically, it comes under Creational Pattern and it is used to create instance and reuse it. Factory Pattern is based on real time factory concept. As we know, a factory is used to manufacture something as per the requirement and if new items are added in the manufacturing process, the factory starts manufacturing those items as well. Factory class provides abstraction between Client and Car when creating the instance of the Car [Honda, BMW etc] increasingly powerful tool for software engineers is the growing collection of design

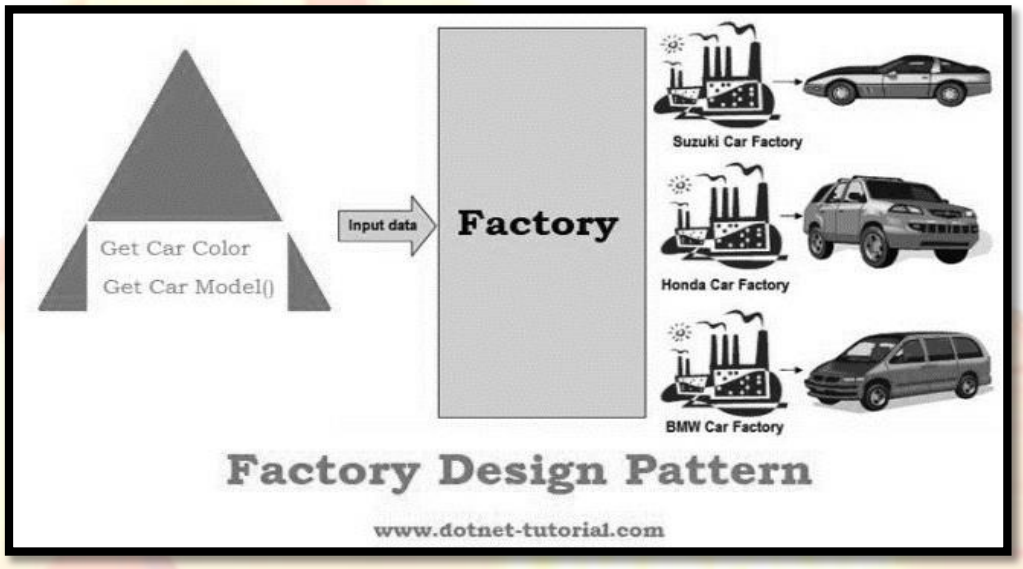


Figure 102: Factory Design Pattern

Shopping Cart Design Pattern:

- It has been shown in the Figure 103.
- Use when the user can possibly buy more than one product.
- Use when the user can possibly buy more than one instance of a product.
- Use when the user may want to return later to carry on shopping
- Use when the user may want to return at a later time to conduct payment
- Do not use when you only have one product to sell.
- Do not use when your site is arranged in a way, so that it does not make sense for the user to buy more than one product at a time (for instance for Application Service Providers (ASPs) allowing a user to upgrade his service).

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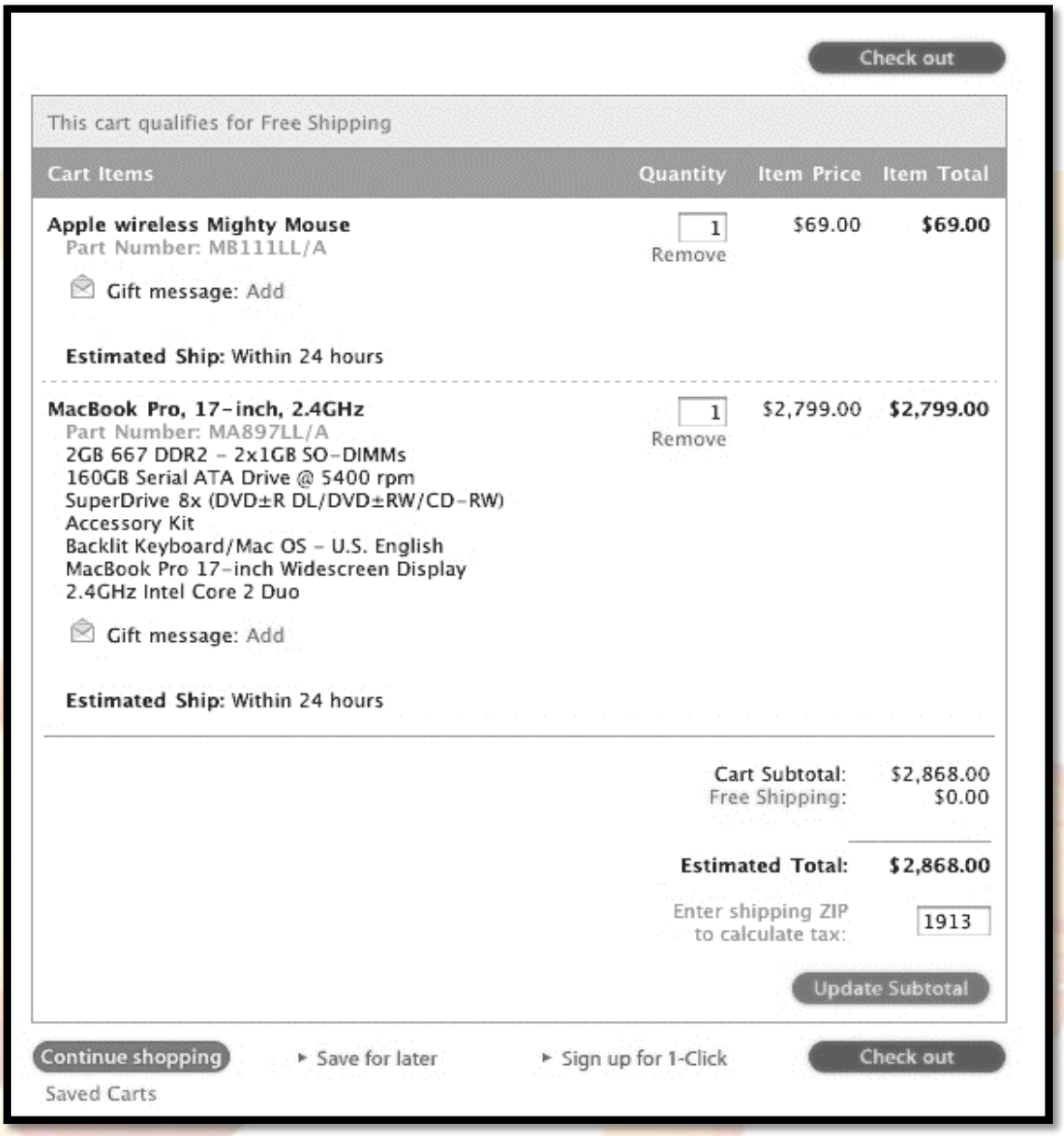


Figure 103: Shopping Cart Design Pattern

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Module 141

80. Software Engineering: Scope of Quality Assurance

In the early years of computing, the problem of producing quality software focused on removing programming errors that occurred during implementation. Later in this section we will discuss the progress that has been made in this direction. However, today, the scope of software quality control extends far beyond the debugging process, with branches including the improvement of software engineering procedures, the development of training programs that in many cases lead to certification, and the establishment of standards on which sound software engineering can be based. In this regard, we have already noted the role of organizations such as ISO, IEEE, and ACM in improving professionalism and establishing standards for assessing quality control within software development companies. A specific example is the ISO 9000 series of standards, which address numerous industrial activities such as design, production, installation, and servicing. Another example is ISO/IEC 15504, which is a set of standards developed jointly by the ISO and the International Electrotechnical Commission (IEC).

Many major software contractors now require that the organizations they hire to develop software meet such standards. As a result, software development companies are establishing **software quality assurance (SQA)** groups, which are charged with overseeing and enforcing the quality control systems adopted by the organization. Thus, in the case of the traditional waterfall model, the SQA group would be charged with the task of approving the software requirements specification before the design stage began or approving the design and its related documents before implementation was initiated.

Several themes underlie today's quality control efforts. One is record keeping. It is paramount that each step in the development process be accurately documented for future reference. However, this goal conflicts with human nature. An issue is the temptation to make decisions or change decisions without updating the related documents. The result is the chance that records will be incorrect and hence their use at future stages will be misleading. Herein lies an important benefit of CASE tools. They make such tasks as redrawing diagrams and updating data dictionaries much easier than with manual methods. Consequently, updates are more likely to be made and the final documentation is more likely to be accurate. (This example is only one of many instances in which software engineering must cope with the faults of human nature. Others include the inevitable personality conflicts, jealousies, and ego clashes that arise when people work together.)

Another quality-oriented theme is the use of reviews in which various parties involved in a software development project meet to consider a specific topic. Reviews occur throughout the software development process, taking the form of requirements reviews, design reviews, and implementation reviews. They may appear as a prototype demonstration in the early stages of requirements analysis, as a structured walkthrough among members of the software design team, or as coordination among programmers who are implementing related portions of the design. Such reviews, on a recurring basis, provide communication channels through which misunderstandings can be avoided and errors can be corrected before they grow into disasters. The significance of reviews is exemplified by the fact that they are specifically addressed in the IEEE Standard for Software Reviews, known as IEEE 1028.

Some reviews are pivotal in nature. An example is the review between representatives of a project's stakeholders and the software development team at which the final software requirements specification is approved. Indeed, this approval marks the end of the formal requirements analysis phase and is the basis on which the remaining development will progress. However, all reviews are significant, and for the sake of quality control, they should be documented as part of the ongoing record maintenance process.

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Module 142

81. Software Engineering: Software Testing

Whereas software quality assurance is now recognized as a subject that permeates the entire development process, testing and verification of the programs themselves continues to be a topic of research. In module 107, we discussed techniques for verifying the correctness of algorithms in a mathematically rigorous manner but concluded that most software today is "verified" by means of testing. Unfortunately, such testing is inexact at best. We cannot guarantee that a piece of software is correct via testing unless we run enough tests to exhaust all possible scenarios. But, even in simple programs, there may be billions of different paths that could potentially be traversed. Thus, testing all possible paths within a complex program is an impossible task.

On the other hand, software engineers have developed testing methodologies that improve the odds of revealing errors in software with a limited number of tests. One of these is based on the observation that errors in software tend to be clumped. That is, experience has shown that a small number of modules within a large software system tend to be more problematic than the rest. Thus, by identifying these modules and testing them more thoroughly, more of the system's errors can be discovered than if all modules were tested in a uniform, less-thorough manner. This is an instance of the proposition known as the **Pareto principle,** in reference to the economist and sociologist Vilfredo Pareto (1848−1923) who observed that a small part of Italy's population controlled most of Italy's wealth. In the field of software engineering, the Pareto principle states that results can often be increased most rapidly by applying efforts in a concentrated area.

Another software testing methodology, called **basis path testing,** is to develop a set of test data that insures that each instruction in the software is executed at least once. Techniques using an area of mathematics known as graph theory have been developed for identifying such sets of test data. Thus, although it may be impossible to ensure that every path through a software system is tested, it is possible to ensure that every statement within the system is executed at least once during the testing process.

Techniques based on the Pareto principle and basis path testing rely on knowledge of the internal composition of the software being tested. They therefore fall within the category called **glass-box testing,** meaning that the software tester is aware of the interior structure of the software and uses this knowledge when designing the test. In contrast is the category called **black-box testing,** which refers to tests that do not rely on knowledge of the software's interior composition. In short, black-box testing is performed from the user's point of view. In black-box testing, one is not concerned with how the software goes about its task but merely with whether the software performs correctly in terms of accuracy and timeliness.

An example of black-box testing is the technique, called **boundary value analysis,** that consists of identifying ranges of data, called **equivalence classes,** over which the software should perform in a similar manner and then testing the software on data close to the edge of those ranges. For example, if the software is supposed to accept input values within a specified range, then the software would be tested at the lowest and highest values in that range, or if the software is supposed to coordinate multiple activities, then the software would be tested on the largest possible collection of activities. The underlying theory is that by identifying equivalence classes, the number of test cases can be minimized because correct operation for a few examples within an equivalence class tends to validate the software for the entire class. Moreover, the best chance of identifying an error within a class is to use data at the class edges.

Another methodology that falls within the black-box category is **beta testing** in which a preliminary version of the software is given to a segment of the intended audience with the goal of learning how the software performs in real-life situations before the final version of the product is solidified and released to the market. (Similar testing performed at the developer's site is called **alpha testing.**) The advantages of beta testing extend far beyond the traditional discovery of errors. General customer feedback (both positive and negative) is obtained that may assist in refining market strategies. Moreover, early distribution of beta

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software assists other software developers in designing compatible products. For example, in the case of a new operating system for the PC market, the distribution of a beta version encourages the development of compatible utility software so that the final operating system ultimately appears on store shelves surrounded by companion products. Moreover, the existence of beta testing can generate a feeling of anticipation within the marketplace—an atmosphere that increases publicity and sales.

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Module 143

82. Software Engineering: Documentation

A software system is of little use unless people can learn to use and maintain it. Hence, documentation is an important part of a final software package, and its development is, therefore, an important topic in software engineering.

Software documentation serves three purposes, leading to three categories of documentation: user documentation, system documentation, and technical documentation. The purpose of **user documentation** is to explain the features of the software and describe how to use them. It is intended to be read by the user of the software and is therefore expressed in the terminology of the application. Today, user documentation is recognized as an important marketing tool. Good user documentation combined with a well-designed user interface makes a software package accessible and thus increases its sales. Recognizing this, many soft- ware developers hire technical writers to produce this part of their product, or they provide preliminary versions of their products to independent authors so that how-to books are available in bookstores when the software is released to the public. User documentation traditionally takes the form of a physical book or booklet, but in many cases the same information is included as part of the software itself. This allows a user to refer to the documentation while using the software. In this case the information may be broken into small units, sometimes called help packages, that may appear on the display screen automatically if the user dallies too long between commands.

The purpose of **system documentation** is to describe the software's internal composition so that the software can be maintained later in its life cycle. A major component of system documentation is the source version of all the programs in the system. It is important that these programs be presented in a readable format, which is why software engineers support the use of well-designed, high-level programming languages, the use of comment statements for annotating a program, and a modular design that allows each module to be presented as a coherent unit. In fact, most companies that produce software products have adopted conventions for their employees to follow when writing programs. These include indentation conventions for organizing a program on the written page; naming conventions that establish a distinction between names of different program constructs such as variables, constants, objects, and classes; and documentation conventions to ensure that all programs are sufficiently documented. Such conventions establish uniformity throughout a company's software, which ultimately simplifies the software maintenance process.

Another component of system documentation is a record of the design documents including the software requirements specification and records showing how these specifications were obtained during design. This information is useful during software maintenance because it indicates why the software was implemented as it was—information that reduces the chance that changes made during maintenance will disrupt the integrity of the system.

The purpose of **technical documentation** is to describe how a software system should be installed and serviced (such as adjusting operating parameters, installing updates, and reporting problems back to the software's developer). Technical documentation of software is analogous to the documentation provided to mechanics in the automobile industry. This documentation does not discuss how the car was designed and constructed (analogous to system documentation), nor does it explain how to drive the car and operate its heating/cooling system (analogous to user documentation). Instead, it describes how to service the car's components, for example, how to replace the transmission or how to track down an intermittent electrical problem.

The distinction between technical documentation and user documentation is blurred in the PC arena because the user is often the person who also installs and services the software. However, in multiuser environments, the distinction is sharper. Therefore, technical documentation is intended for the system administrator who

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is responsible for servicing all the software under his or her jurisdiction, allowing the users to access the software packages as abstract tools.

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Module 144

83. Software Engineering: Human Machine Interface

One of the tasks during requirements analysis is to define how the proposed software system will interact with its environment. In this section we consider topics associated with this interaction when it involves communicating with humans—a subject with profound significances. After all, humans should be allowed to use a software system as an abstract tool. This tool should be easy to apply and designed to minimize (ideally eliminate) communication errors between the system and its human users. This means that the system's interface should be designed for the convenience of humans rather than merely the expediency of the software system.

The importance of good interface design is further emphasized by the fact that a system's interface is likely to make a stronger impression on a user than any other system characteristic. After all, a human tends to view a system in terms of its usability, not in terms of how cleverly it performs its internal tasks. From a human's perspective, the choice between two competing systems is likely to be based on the systems' interfaces. Thus, the design of a system's interface can ultimately be the determining factor in the success or failure of a software engineering project.

For these reasons, the human-machine interface has become an important concern in the requirements stage of software development projects and is a growing subfield of software engineering. In fact, some would argue that the study of human-machine interfaces is an entire field in its own right.

A beneficiary of research in this field is the smartphone interface. In order to attain the goal of a convenient pocket-sized device, elements of the traditional human-machine interface (full-sized keyboard, mouse, scroll bars, menus) are being replaced with new approaches; such as gestures performed on a touch screen, voice commands, and virtual keyboards with advanced auto-completion of words and phrases. While these represent significant progress, most smartphone users would argue that there is plenty of room for further innovation.

Research in human-machine interface design draws heavily from the areas of engineering called **ergonomics,** which deals with designing systems that harmonize with the physical abilities of humans, and **cognetics,** which deals with designing systems that harmonize with the mental abilities of humans. Of the two, ergonomics is the better understood, largely because humans have been interacting physically with machines for centuries. Examples are found in ancient tools, weaponry, and transportation systems. Much of this history is self-evident; however, at times the application of ergonomics has been counterintuitive. An often-cited example is the design of the typewriter keyboard (now reincarnated as the computer keyboard) in which the keys were intentionally arranged to reduce a typist's speed so that the mechanical system of levers used in the early machines would not jam. Mental interaction with machines, in contrast, is a relatively new phenomenon, and thus, it is cognetics that offers the higher potential for fruitful research and enlightening insights. Often the findings are interesting in their subtlety. For example, humans form habits—a trait that, on the surface, is good because it can increase efficiency. But habits can also lead to errors, even when the design of an interface intentionally addresses the problem. Consider the process of a human asking a typical operating system to delete a file. To avoid unintentional deletions, most interfaces respond to such a request by asking the user to confirm the request—perhaps via a message such as, "Do you really want to delete this file?" At first glance, this confirmation requirement would seem to resolve any problem of unintentional deletions. However, after using the system for an extended period, a human develops the habit of automatically answering the question with "yes." Thus, the task of deleting a file ceases to be a two-step process consisting of a delete command followed by a thoughtful response to a question. Instead, it becomes a one-step "delete-yes" process, meaning that by the time the human realizes that an incorrect delete request has been submitted, the request has already been confirmed and the deletion has occurred.

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The formation of habits may also cause problems when a human is required to use several application software packages. The interfaces of such packages may be similar yet different. Similar user actions may result in different system responses or similar system responses may require different user actions. In these cases habits developed in one application may lead to errors in the other applications.

Another human characteristic that concerns researchers in human-machine interface design is the narrowness of a human's attention, which tends to become more focused as the level of concentration increases. As a human becomes more engrossed in the task at hand, breaking that focus becomes more difficult. In 1972, a commercial aircraft crashed because the pilots became so absorbed with a landing gear problem (actually, with the process of changing the landing gear indicator light bulb) that they allowed the plane to fly into the ground, even though warnings were sounding in the cockpit.

Less critical examples appear routinely in PC interfaces. For example, a "Caps Lock" light is provided on most keyboards to indicate that the keyboard is in "Caps Lock" mode (i.e., the "Caps Lock" key has been pressed). However, if the key is accidentally pressed, a human rarely notices the status of the light until strange characters begin to appear on the display screen. Even then, the user often puzzles over the predicament for a while until realizing the cause of the problem. In a sense, this is not surprising—the light on the keyboard is not in the user's field of view. However, users often fail to notice indicators placed directly in their line of sight. For example, users can become so engaged in a task that they fail to observe changes in the appearance of the cursor on the display screen, even though their task involves watching the cursor.

Still another human characteristic that must be anticipated during interface design is the mind's limited capacity to deal with multiple facts simultaneously. In an article in *Psychological Review* in 1956, George A. Miller reported research indicating that the human mind is capable of dealing with only about seven details at once. Thus, it is important that an interface be designed to present all the relevant information when a decision is required rather than to rely on the human user's memory. In particular, it would be poor design to require that a human remember precise details from previous screen images. Moreover, if an interface requires extensive navigation among screen images, a human can get lost in the maze. Thus, the content and arrangement of screen images becomes an important design issue. Although applications of ergonomics and cognetics give the field of human- machine interface design a unique flavor, the field also encompasses many of the more traditional topics of software engineering. In particular, the search for metrics is just as important in the field of interface design as it is in the more traditional areas of software engineering. Interface characteristics that have been subjected to measurement include the time required to learn an interface, the time required to perform tasks via the interface, the rate of user-interface errors, the degree to which a user retains proficiency with the interface after periods of nonuse, and even such subjective traits as the degree to which users like the interface.

The **GOMS** (rhymes with "Toms") model, originally introduced in 1954, is representative of the search for metrics in the field of human-machine interface design. The model's underlying methodology is to analyze tasks in terms of user goals (such as delete a word from a text), operators (such as click the mouse but- ton), methods (such as double-click the mouse button and press the delete key), and selection rules (such as choose between two methods of accomplishing the same goal). This, in fact, is the origin of the acronym GOMS—goals, operators, methods, and selection rules. In short, GOMS is a methodology that allows the actions of a human using an interface to be analyzed as sequences of elementary steps (press a key, move the mouse, make a decision). The performance of each elementary step is assigned a precise time period, and thus, by adding the times assigned to the steps in a task, GOMS provides a means of comparing different proposed interfaces in terms of the time each would require when performing similar tasks.

Understanding the technical details of systems such as GOMS is not the purpose of our current study. The point in our case is that GOMS is founded on features of human behavior (moving hands, making decisions, and so on). In fact, the development of GOMS was originally considered a topic in psychology. Thus,

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GOMS reemphasizes the role that human characteristics play in the field of human-machine interface design, even in the topics that are carryovers from traditional software engineering.

The design of human-machine interfaces promises to be an active field of research in the foreseeable future. Many issues dealing with today's GUIs are yet unresolved, and a multitude of additional problems lurk in the use of three-dimensional interfaces that are now on the horizon. Indeed, because these interfaces promise to combine audio and tactile communication with three- dimensional vision, the scope of potential problems is enormous.

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Module 145

84. Software Engineering: Software Ownership and Liability

Most would agree that a company or individual should be allowed to recoup, and profit from, the investment needed to develop quality software. Otherwise, it is unlikely that many would be willing to undertake the task of producing the software our society desires. In short, software developers need a level of ownership over the software they produce.

Legal efforts to provide such ownership fall under the category of **intellectual property** law, much of which is based on the well-established principles of copyright and patent law. Indeed, the purpose of a copyright or patent is to allow the developer of a product to release that product (or portions thereof) to intended parties while protecting his or her ownership rights. As such, the developer of a product (whether an individual or a corporation) will assert his or her ownership by including a copyright statement in all produced works; including requirement specifications, design documents, source code, test plans, and in some visible place within the final product. A copyright notice clearly identifies ownership, the personnel authorized to use the work, and other restrictions. Furthermore, the rights of the developer are formally expressed in legal terms in a **software license.**

A software license is a legal agreement between the owner and user of a software product that grants the user certain permissions to use the product without transferring ownership rights to the intellectual property. These agreements spell out, to a fine level of detail, the rights and obligations of both parties. Thus, it is important to carefully read and understand the terms of the software license before installing and using a software product.

While copyrights and software license agreements provide legal avenues to inhibit outright copying and unauthorized use of software, they are generally insufficient to prevent another party from independently developing a product with a nearly identical function. It is sad that over the years there have been many occasions where the developer of a truly revolutionary software product was unable to capitalize fully on his or her invention (two notable examples are spreadsheets and web browsers). In most of these cases, another company was successful in developing a competitive product that secured a dominant share of the market. A legal path to prevent this intrusion by a competitor is found in patent law.

Patent laws were established to allow an inventor to benefit commercially from an invention. To obtain a patent, the inventor must disclose the details of the invention and demonstrate that it is new, useful, and not obvious to others with similar backgrounds (a requirement that can be quite challenging for software). If a patent is granted, the inventor is given the right to prevent others from making, using, selling, or importing the invention for a limited period of time, which is typically 20 years from the date the patent application was filed.

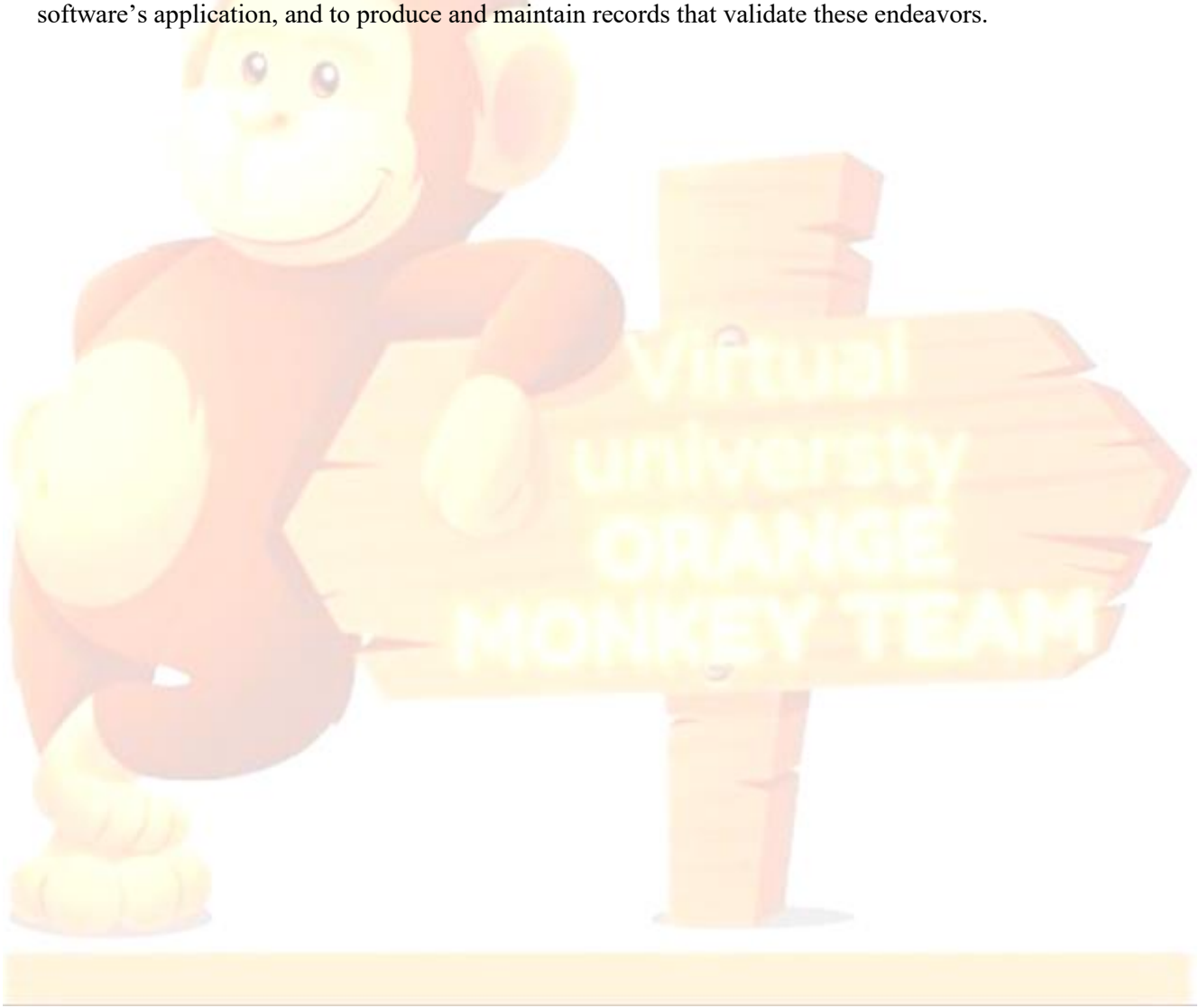
One drawback to the use of patents is that the process to obtain a patent is expensive and time-consuming, often involving several years. During this time a software product could become obsolete, and until the patent is granted the applicant has only questionable authority to exclude others from appropriating the product.

The importance of recognizing copyrights, software licenses, and patents is paramount in the software engineering process. When developing a software product, software engineers often choose to incorporate software from other products, whether it be an entire product, subset of components, or even portions of source code downloaded over the Internet. However, failure to honor intellectual property rights during this process may lead to huge liabilities and consequences. For example, in 2004, a little-known company, NPT Inc., successfully won a lawsuit against Research in Motion (RIM—the makers of the BlackBerry smartphones) for patent infringement of a few key technologies embedded in RIM's email systems. The

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judgment included an injunction to suspend email services to all BlackBerry users in the United States! RIM eventually reached an agreement to pay NPT a total of $612.5 million, thereby averting a shutdown.

Finally, we should address the issue of liability. To protect themselves against liability, software developers often include disclaimers in the software licenses that state the limitations of their liability. Such statements as "In no event will Company X be liable for any damages arising out of the use of this software" are common. Courts, however, rarely recognize a disclaimer if the plaintiff can show negligence on the part of the defendant. Thus, liability cases tend to focus on whether the defendant used a level of care compatible with the product being produced. A level of care that might be deemed acceptable in the case of developing a word processing system may be considered negligent when developing software to control a nuclear reactor. Consequently, one of the best defenses against software liability claims is to apply sound software engineering principles during the software's development, to use a level of care compatible with the software's application, and to produce and maintain records that validate these endeavors.



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Module 146

85. Data Abstraction: Arrays and Aggregates

Recall that an **array** is a "rectangular" block of data whose entries are of the same type. The simplest form of array is the one-dimensional array, a single row of elements with each position identified by an index. A one-dimensional array with 26 elements could be used to store the number of times each alphabet letter occurs in a page of text, for example. A two-dimensional array consists of multiple rows and columns in which positions are identified by pairs of indices—the first index identifies the row associated with the position; the second index identifies the column. An example would be a rectangular array of numbers representing the monthly sales made by members of a sales force—the entries across each row representing the monthly sales made by a particular member and the entries down each column representing the sales by each member for a particular month. Thus, the entry in the third row and first column would represent the sales made by the third salesperson in January.

In contrast to an array, recall that an **aggregate type** is a block of data items that might be of different types and sizes. The items within the block are usually called **fields.** An example of an aggregate type would be the block of data relating to a single employee, the fields of which might be the employee's name (an array of type character), age (of type integer), and skill rating (of type float). Fields in an aggregate type are usually accessed by field name, rather than by a numerical index number.

Module 147

86. Data Abstraction: List, Stacks and Queues

Another basic data structure is a **list,** which is a collection whose entries are arranged sequentially (Figure 104a). The beginning of a list is called the **head** of the list. The other end of a list is called the **tail.**

Almost any collection of data can be envisioned as a list. For example, text can be envisioned as a list of symbols, a two-dimensional array can be envisioned as a list of rows, and music recorded on a CD can be envisioned as a list of sounds. More traditional examples include guest lists, shopping lists, class enrollment lists, and inventory lists. Activities associated with a list vary depending on the situation. In some cases we may need to remove entries from a list, add new entries to a list, "process" the entries in a list one at a time, change the arrangement of the entries in a list, or perhaps search to see if a particular item is in a list. We will investigate such operations later in this chapter.

By restricting the manner in which the entries of a list are accessed, we obtain two special types of lists known as stacks and queues. A **stack** is a list in which entries are inserted and removed only at the head. An example is a stack of books where physical restrictions dictate that all additions and deletions occur at the top (Figure 104b). Following colloquial terminology, the head of a stack is called the **top** of the stack. The tail of a stack is called its **bottom** or **base.** Inserting a new entry at the top of a stack is called **pushing** an entry. Removing an entry from the top of a stack is called **popping** an entry. Note that the last entry placed on a stack will always be the first entry removed—an observation that leads to a stack being known as a **last-in, first-out,** or **LIFO** (pronounced "LIE-foe") structure.

This LIFO characteristic means that a stack is ideal for storing items that must be retrieved in the reverse order from which they were stored, and thus a stack is often used as the underpinning of backtracking activities. (The term **backtracking** refers to the process of backing out of a system in the opposite order from which the system was entered. A classic example is the process of retracing one's steps in order to find one's way out of a forest.) For instance, consider the underlying structure required to support a recursive process. As each new activation is started, the previous activation must be set aside. Moreover, as each activation is completed, the last activation that was set aside must be retrieved. Thus, if the

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activations are pushed on a stack as they are set aside, then the proper activation will be on the top of the stack each time an activation needs to be retrieved.

A **queue** is a list in which the entries are removed only at the head and new entries are inserted only at the tail. An example is a line, or queue, of people waiting to buy tickets at a theater (Figure 104c)—the person at the head of the queue is served while new arrivals step to the rear (or tail) of the queue. A queue is a **first-in, first-out,** or **FIFO** (pronounced "FIE-foe") structure, meaning that the entries are removed from a queue in the order in which they were stored.

Queues are often used as the underlying structure of a buffer, which is a storage area for the temporary placement of data being transferred from one location to another. As the items of data arrive at the buffer, they are placed at the tail of the queue. Then, when it comes time to forward items to their final destination, they are forwarded in the order in which they appear at the head of the queue. Thus, items are forwarded in the same order in which they arrived.

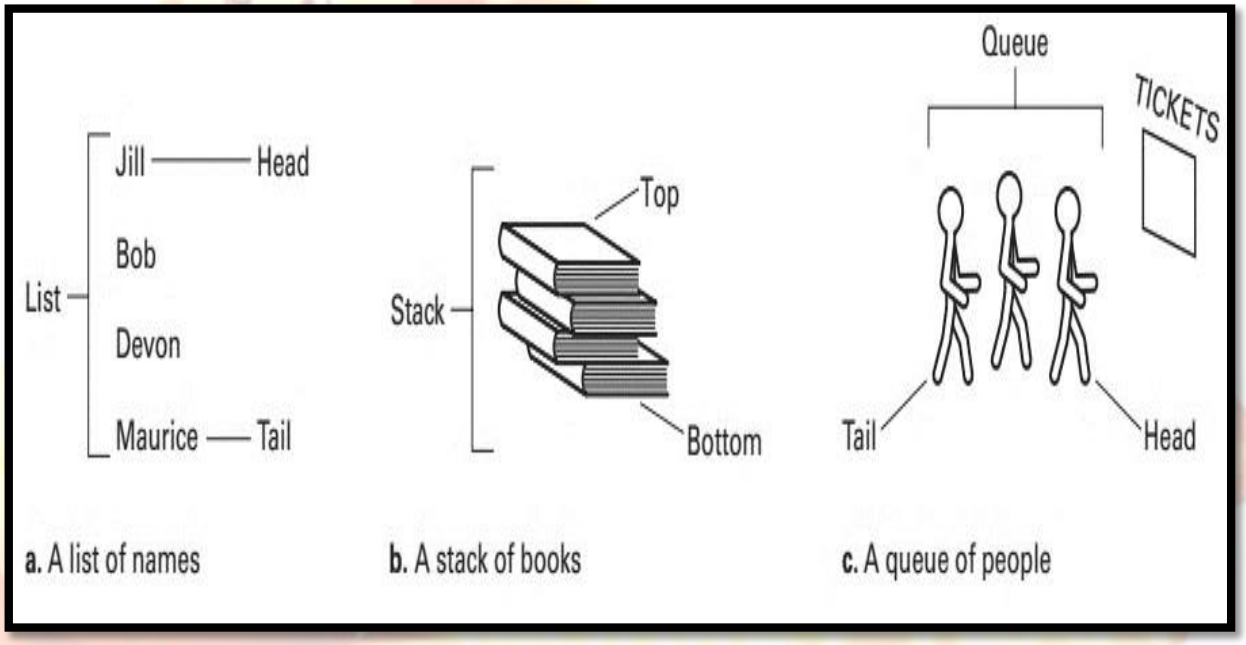


Figure 104: Lists, stacks, and queues

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Module 148

87. Data Abstraction: Trees

A **tree** is a collection whose entries have a hierarchical organization similar to that of an organization chart of a typical company (Figure 105). The president is represented at the top, with lines branching down to the vice presidents, who are followed by regional managers, and so on. To this intuitive definition of a tree structure we impose one additional constraint, which (in terms of an organization chart) is that no individual in the company reports to two different superiors. That is, different branches of the organization do not merge at a lower level. (We have already seen examples of trees in Chapter 6 where they appeared in the form of parse trees.)

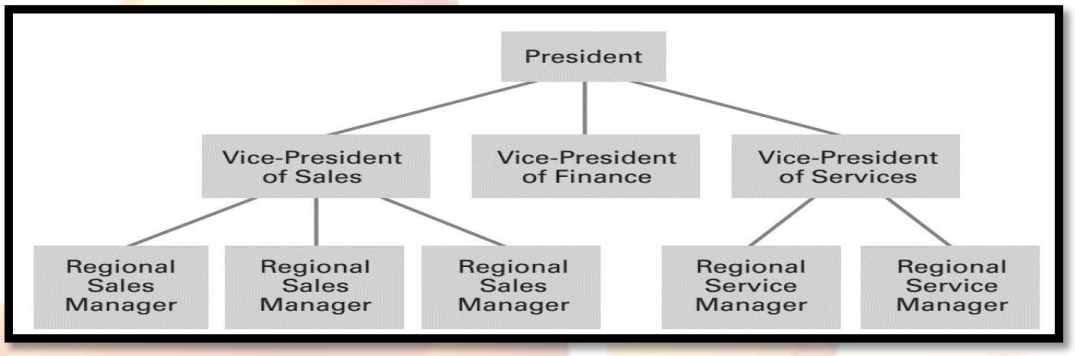


Figure 105: An example of an organization chart

Each position in a tree is called a **node** (Figure 106). The node at the top is called the **root node** (if we turned the drawing upside down, this node would represent the base or root of the tree). The nodes at the other extreme are called **terminal nodes** (or sometimes **leaf nodes**). We often refer to the number of nodes in the longest path from the root to a leaf as the **depth** of the tree. In other words, the depth of a tree is the number of horizontal layers within it.

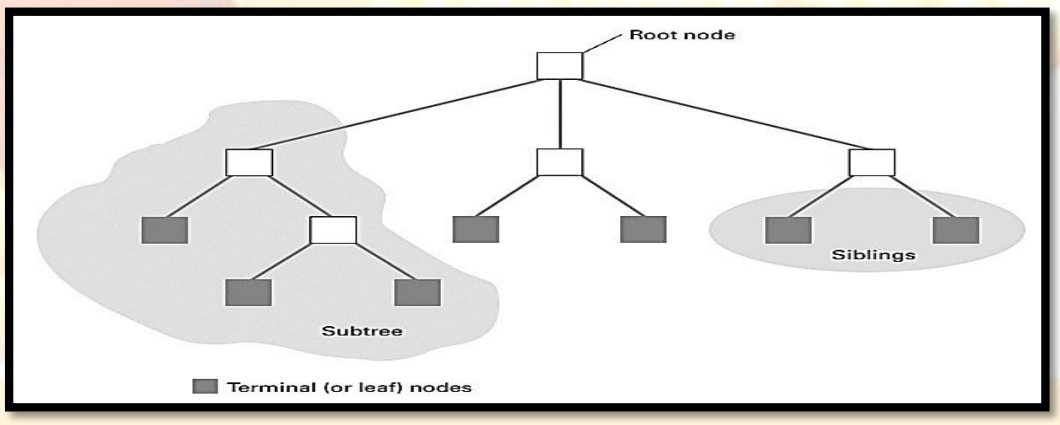


Figure 106: Tree terminology

At times we refer to tree structures as though each node gives birth to those nodes immediately below it. In this sense, we often speak of a node's ancestors or descendants. We refer to its immediate descendants as its **children** and its immediate ancestor as its **parent.** Moreover, we speak of nodes with the same parent as being **siblings.** A tree in which each parent has no more than two children is called a **binary tree.**

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If we select any node in a tree, we find that that node together with the nodes below it also has the structure of a tree. We call these smaller structures **subtrees.** Thus, each child node is the root of a subtree below the child's parent. Each such subtree is called a **branch** from the parent. In a binary tree, we often speak of a node's left branch or right branch in reference to the way the tree is displayed.

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Module 149

88. Data Abstraction: Pointers

Recall that the various cells in a machine's main memory are identified by numeric addresses. Being numeric values, these addresses themselves can be encoded and stored in memory cells. A **pointer** is a storage area that contains such an encoded address. In the case of data structures, pointers are used to record the location where data items are stored. For example, if we must repeatedly move an item of data from one location to another, we might designate a fixed location to serve as a pointer. Then, each time we move the item, we can update the pointer to reflect the new address of the data. Later, when we need to access the item of data, we can find it by means of the pointer. Indeed, the pointer will always "point" to the data.

We have already encountered the concept of a pointer in our study of CPUs in the module 36. There we found that a register called a program counter is used to hold the address of the next instruction to be executed. Thus, the program counter plays the role of a pointer. In fact, another name for a program counter is **instruction pointer.**

As an example of the application of pointers, suppose we have a list of novels stored in a computer's memory alphabetically by title. Although convenient in many applications, this arrangement makes it difficult to find all the novels by a particular author—they are scattered throughout the list. To solve this problem, we can reserve an additional memory cell within each block of cells representing a novel and use this cell as a pointer to another block representing a book by the same author. In this manner the novels with common authorship can be linked in a loop (Figure 8.4). Once we find one novel by a given author, we can find all the others by following the pointers from one book to another.

Many modern programming languages include pointers as a primitive data type. That is, they allow the declaration, allocation, and manipulation of pointers in ways reminiscent of integers and character strings. Using such a language, a programmer can design elaborate networks of data within a machine's memory where pointers are used to link related items to each other.

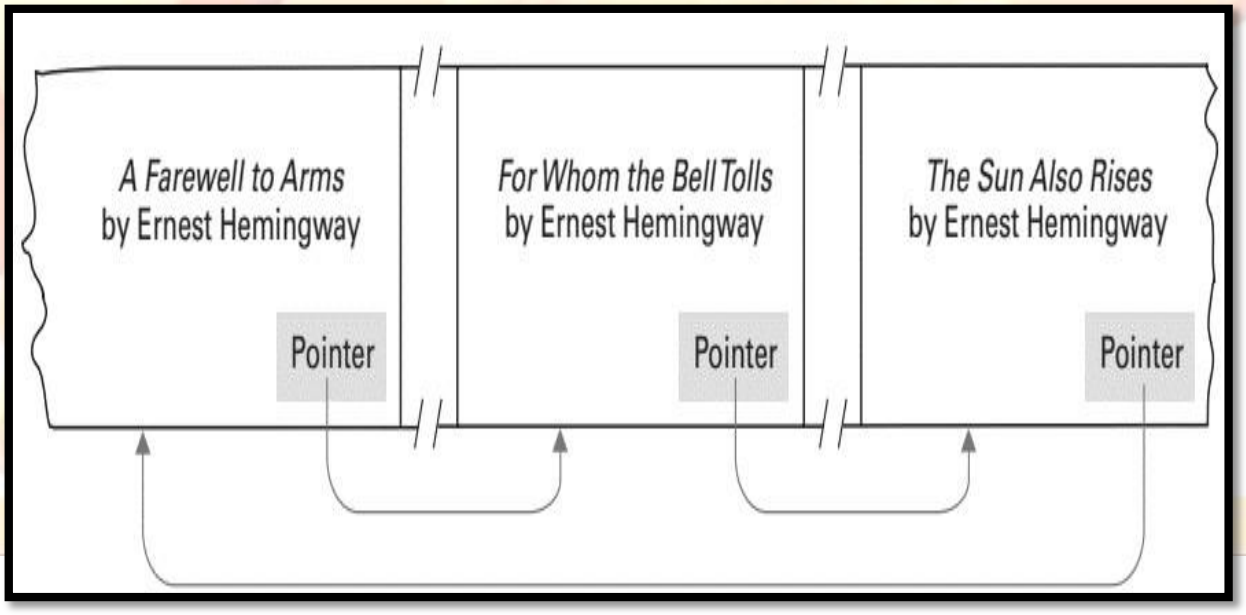


Figure 107: Novels arranged by title but linked according to authorship

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Module 150

89. Database Systems: The Significance of Database Systems

The term **database** refers to a collection of data that is multidimensional in the sense that internal links between its entries make the information accessible from a variety of perspectives. This is in contrast to a traditional file system, sometimes called a **flat file,** which is a one-dimensional storage system, meaning that it presents its information from a single point of view. Whereas a flat file containing information about composers and their compositions might provide a list of compositions arranged by composer, a database might present all the works by a single composer, all the composers who wrote a particular type of music, and perhaps the composers who wrote variations of another composer's work.

Historically, as computing machinery found broader uses in information management, each application tended to be implemented as a separate system with its own collection of data. Payroll was processed using the payroll file, the personnel department maintained its own employee records, and inventory was managed via an inventory file. This meant that much of the information required by an organization was duplicated throughout the company, while many different but related items were stored in separate systems. In this setting, database systems emerged as a means of integrating the information stored and maintained by a particular organization (Figure 108). With such a system, the same sales data could be used to produce restocking orders; create reports on market trends, direct advertisements, and product announcements to customers who are most likely to respond favorably to such information; and generate bonus checks for members of the sales force.

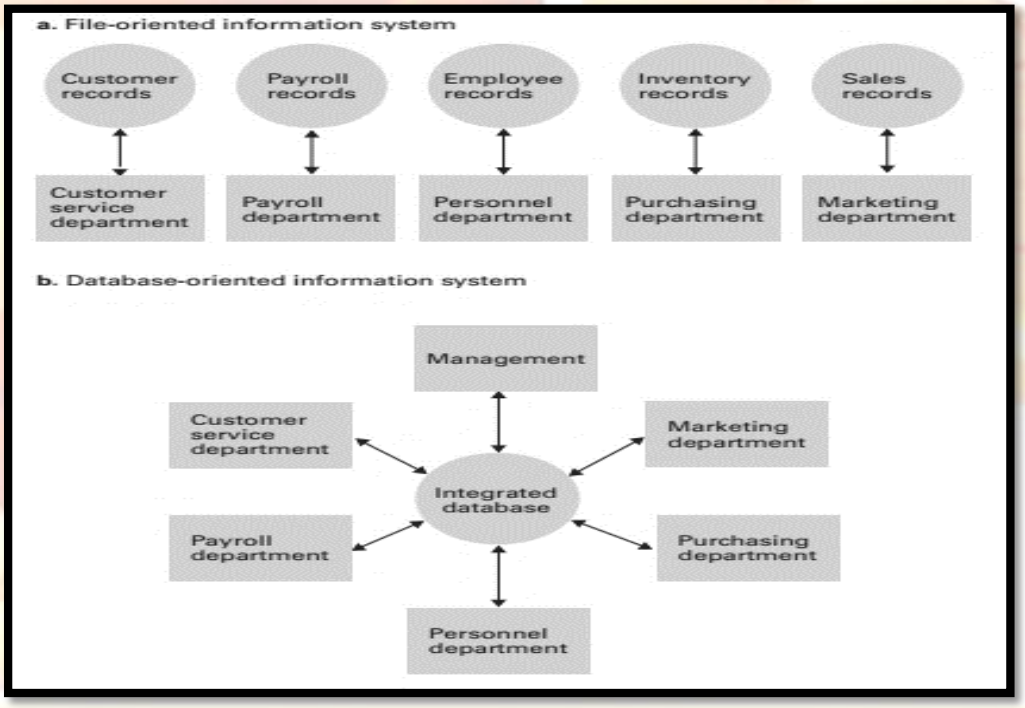


Figure 108: A file versus a database organization

Such integrated pools of information provided a valuable resource with which management decisions could be made, assuming the information could be accessed in a meaningful way. In turn, database research focused on developing techniques by which the information in a database could be brought to the decision-

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making process. Much progress has been made in this regard. Today, database technology, combined with data mining techniques, is an important management tool, allowing the management of an organization to extract pertinent information from enormous amounts of data covering all aspects of the organization and its environment.

Moreover, database systems have become the underlying technology that supports many of the more popular sites on the World Wide Web. The underlying theme of sites such as Google, eBay, and Amazon is to provide an interface between clients and databases. To respond to a client's request, the server interrogates a database, organizes the results in the form of a Web page, and sends that page to the client. Such Web interfaces have popularized a new role for database technology in which a database is no longer a means of storing a company's records but, instead, is the company's product. Indeed, by combining database technology with Web interfaces, the Internet has become a major world-wide information source.

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Module 151

90. Database Systems: Role of Schema

Among the disadvantages of the proliferation of database technology is the potential of sensitive data being accessed by unauthorized personnel. Someone placing an order at a company's website should not have access to the company's financial data; similarly, an employee in a company's benefits department may need access to the company's employee records but should not have access to the corporation's inventory or sales records. Thus, the ability to control access to the information in the database is as important as the ability to share it.

To provide different users access to different information within a database, database systems often rely on schemas and subschemas. A **schema** is a description of the entire database structure that is used by the database software to maintain the database. A **subschema** is a description of only that portion of the database pertinent to a particular user's needs. For example, a schema for a university database would indicate that each student record contains such items as the current address and phone number of that student in addition to the student's academic record. Moreover, it would indicate that each student record is linked to the record of the student's faculty adviser. In turn, the record for each faculty member would contain the person's address, employment history, and so on. Based on this schema, a linkage system would be maintained that ultimately connected the information about a student to the employment history of a faculty member.

To keep the university's registrar from using this linkage to obtain privileged information about the faculty, the registrar's access to the database must be restricted to a subschema whose description of the faculty records does not include employment history. Under this subschema, the registrar could find out which faculty member is a particular student's adviser but could not obtain access to additional information about that faculty member. In contrast, the subschema for the payroll department would provide the employment history of each faculty member but would not include the linkage between students and advisers. Thus the payroll department could modify a faculty member's salary but could not obtain the names of the students advised by that person.

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Module 152

91. Database Systems: Database Management Systems

A typical database application involves multiple software layers, which we will group into two major layers—an application layer and a database management layer (Figure 109). The application software handles the communication with the user of the database and may be quite complex, as exemplified by applications in which users access a database by means of a website. In that case the entire application layer consists of clients throughout the Internet and a server that uses the database to fill the requests from the clients.

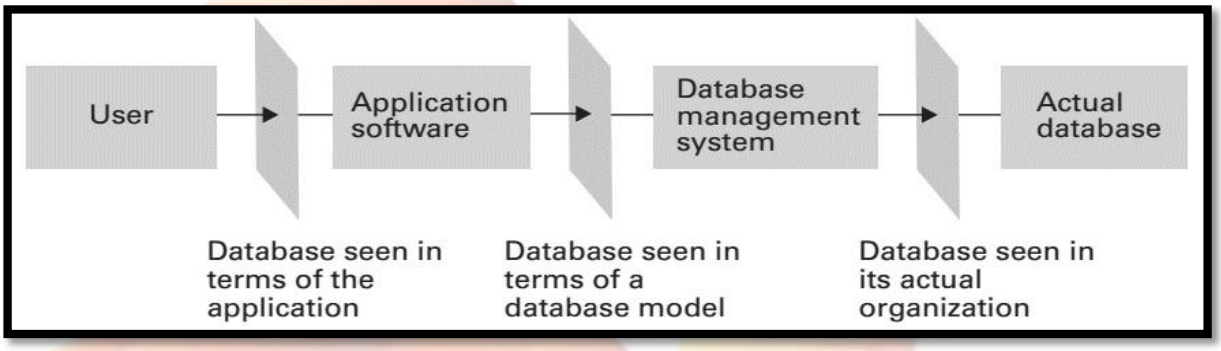


Figure 109: The conceptual layers of a database implementation

Note that the application software does not directly manipulate the data- base. The actual manipulation of the database is accomplished by the **database management system (DBMS).** Once the application software has determined what action the user is requesting, it uses the DBMS as an abstract tool to obtain the results. If the request is to add or delete data, it is the DBMS that actually alters the database. If the request is to retrieve information, it is the DBMS that performs the required searches.

This dichotomy between the application software and the DBMS has sev- eral benefits. One is that it allows for the construction and use of abstract tools, which we have repeatedly found to be a major simplifying concept in software design. If the details of how the database is actually stored are isolated within the DBMS, the design of the application software can be greatly simplified. For instance, with a well-designed DBMS, the application software does not have to be concerned with whether the database is stored on a single machine or scattered among many machines within a network as a **distributed database.** Instead, the DBMS would deal with these issues, allowing the application soft- ware to access the database without concern for where the data is actually stored.

A second advantage of separating the application software from the DBMS is that such an organization provides a means for controlling access to the database. By dictating that the DBMS performs all access to the database, the DBMS can enforce the restrictions imposed by the various subschemas. In particular, the DBMS can use the entire database schema for its internal needs but can require that the application software employed by each user remain within the bounds described by that user's subschema.

Still another reason for separating the user interface and actual data manipulation into two different software layers is to achieve **data independence**—the ability to change the organization of the database itself without changing the application software. For example, the personnel department might need to add an additional field to each employee's record to indicate whether the corresponding employee chose to participate in the company's new health insurance program. If the application software dealt directly with the database, such a change in the data's format could require modifications to all application programs dealing with the database. As a result, the change instigated by the personnel department might cause

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changes to the payroll program as well as to the program for printing mailing labels for the company's newsletter.

The separation between application software and a DBMS removes the need for such reprogramming. To implement a change in the database required by a single user, one needs to change only the overall schema and the subschemas of those users involved in the change. The subschemas of all the other users remain the same, so their application software, which is based on the unaltered subschemas, does not need to be modified.

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Module 153

92. Database Systems: Relational Database model

We have repeatedly seen how abstraction can be used to hide internal complexities. Database management systems provide yet another example. They hide the complexities of a database's internal structure, allowing the user of the database to imagine that the information stored in the database is arranged in a more useful format. In particular, a DBMS contains routines that translate commands stated in terms of a conceptual view of the database into the actions required by the actual data storage system. This conceptual view of the database is called a **database model.**

Relational database model portrays data as being stored in rectangular tables, called **relations,** which are similar to the format in which information is displayed by spreadsheet programs. For example, the relational model allows information regarding the employees of a firm to be represented by a relation such as that shown in Figure 110.

A row in a relation is called a **tuple** (some say "TOO-pul," others say "TUH-pul"). In the relation of Figure 110, tuples consist of the information about a particular employee. Columns in a relation are referred to as **attributes** because each entry in a column describes some characteristic, or attribute, of the entity represented by the corresponding tuple.

Empl Id	Name	Address	SSN
25X15	Joe E. Baker	33 Nowhere St.	111223333
34Y70	Cheryl H. Clark	563 Downtown Ave.	999009999
23Y34	G. Jerry Smith	1555 Circle Dr.	111005555
•	•	•	•
•	•	•	•
•	•	•	•

Figure 110: A relation containing employee information

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Module 154

93. Database Systems: Issues of Relational Designs

A pivotal step in designing a relational database is to design the relations making up the database. Although this might appear to be a simple task, many subtleties are waiting to trap the unwary designer.

Suppose that in addition to the information contained in the relation of Figure 110, we want to include information about the jobs held by the employees. We might want to include a job history associated with each employee that consists of such attributes as job title (secretary, office manager, floor supervisor), a job identification code (unique to each job), the skill code associated with each job, the department in which the job exists, and the period during which the employee held the job in terms of a starting date and termination date. (We use an asterisk as the termination date if the job represents the employee's current position.)

One approach to this problem is to extend the relation in Figure 110 to include these attributes as additional columns in the table, as shown in Figure 111. However, close examination of the result reveals several problems. One is a lack of efficiency due to redundancy. The relation no longer contains one tuple for each employee but rather one tuple for each assignment of an employee to a job. If an employee has advanced in the company through a sequence of several jobs, several tuples in the new relation must contain the same information about the employee (name, address, identification number, and Social Security number). For example, the personal information about Baker and Smith is repeated because they have held more than one job. Moreover, when a particular position has been held by numerous employees, the department associated with that job along with the appropriate skill code must be repeated in each tuple representing an assignment of the job. For example, the description of the floor manager job is duplicated because more than one employee has held this position.

Empl Id	Name	Address	SSN	Job Id	Job Title	Skill Code	Dept	Start Date	Term Date
25X15	Joe E. Baker	33 Nowhere St.	111223333	F5	Floor manager	FM3	Sales	9-1-2009	9-30-2010
25X15	Joe E. Baker	33 Nowhere St.	111223333	D7	Dept. head	K2	Sales	10-1-2010	*
34Y70	Cheryl H. Clark	563 Downtown Ave.	999009999	F5	Floor manager	FM3	Sales	10-1-2009	*
23Y34	G. Jerry Smith	1555 Circle Dr.	111005555	S25X	Secretary	T5	Personnel	3-1-1999	4-30-2010
23Y34	G. Jerry Smith	1555 Circle Dr.	111005555	S26Z	Secretary	T6	Accounting	5-1-2010	*
•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•

Figure 111: A relation containing redundancy

Another, perhaps more serious, problem with our extended relation surfaces when we consider deleting information from the database. Suppose for example that Joe E. Baker is the only employee to hold the job identified as D7. If he were to leave the company and be deleted from the database represented in Figure 111, we would lose the information about job D7. After all, the only tuple containing the fact that job D7 requires a skill level of K2 is the tuple relating to Joe Baker.

You might argue that the ability to erase only a portion of a tuple could solve the problem, but this would in turn introduce other complications. For instance, should the information relating to job F5 also be retained in a partial tuple, or does this information reside elsewhere in the relation? Moreover, the temptation to use partial tuples is a strong indication that the design of the database can be improved.

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The cause of all these problems is that we have combined more than one concept in a single relation. As proposed, the extended relation in Figure 111 contains information dealing directly with employees (name, identification number, address, Social Security number), information about the jobs available in the company (job identification, job title, department, skill code), and information regarding the relationship between employees and jobs (start date, termination date). On the basis of this observation, we can solve our problems by redesigning the system using three relations—one for each of the preceding categories. We can keep the original relation in Figure 110 (which we now call the EMPLOYEE relation) and insert the additional information in the form of the two new relations called JOB and ASSIGNMENT, which produces the database in Figure 112

Empl Id	Name	Address	SSN
25X15	Joe E. Baker	33 Nowhere St.	111223333
34Y70	Cheryl H. Clark	563 Downtown Ave.	999009999
23Y34	G. Jerry Smith	1555 Circle Dr.	111005555

JOB relation

Job Id	Job Title	Skill Code	Dept
S25X	Secretary	T5	Personnel
S26Z	Secretary	T6	Accounting
F5	Floor manager	FM3	Sales
•	•	•	•
•	•	•	•
•	•	•	•

ASSIGNMENT relation

Empl Id	Job Id	Start Date	Term Date
23Y34	S25X	3-1-1999	4-30-2010
34Y70	F5	10-1-2009	*
23Y34	S26Z	5-1-2010	*
•	•	•	•
•	•	•	•
•	•	•	•

Figure 112: An employee database consisting of three relations

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Module 155

94. Database Systems: Relational operators

Now that you have a basic understanding of how data can be organized in terms of the relational model, it is time to see how information can be extracted from a database consisting of relations. We begin with a look at some operations that we might want to perform on relations.

At times we need to select certain tuples from a relation. To retrieve the information about an employee, we must select the tuple with the appropriate identification attribute value from the EMPLOYEE relation, or to obtain a list of the job titles in a certain department, we must select the tuples from the JOB relation having that department as their department attribute. The result of such a process is another relation consisting of the tuples selected from the parent relation. The outcome of selecting information about a particular employee results in a relation containing only one tuple from the EMPLOYEE relation. The outcome of selecting the tuples associated with a certain department results in a relation that probably contains several tuples from the JOB relation.

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Module 156

95. Database Systems: Select Operation

One operation we might want to perform on a relation is to select tuples possessing certain characteristics and to place these selected tuples in a new relation. To express this operation, we adopt the syntax

NEW <- SELECT from EMPLOYEE where EmplId = '34Y70'

The semantics of this statement is to create a new relation called NEW containing those tuples (there should be only one in this case) from the relation EMPLOYEE whose EmplId attribute equals 34Y70 (Figure 113).

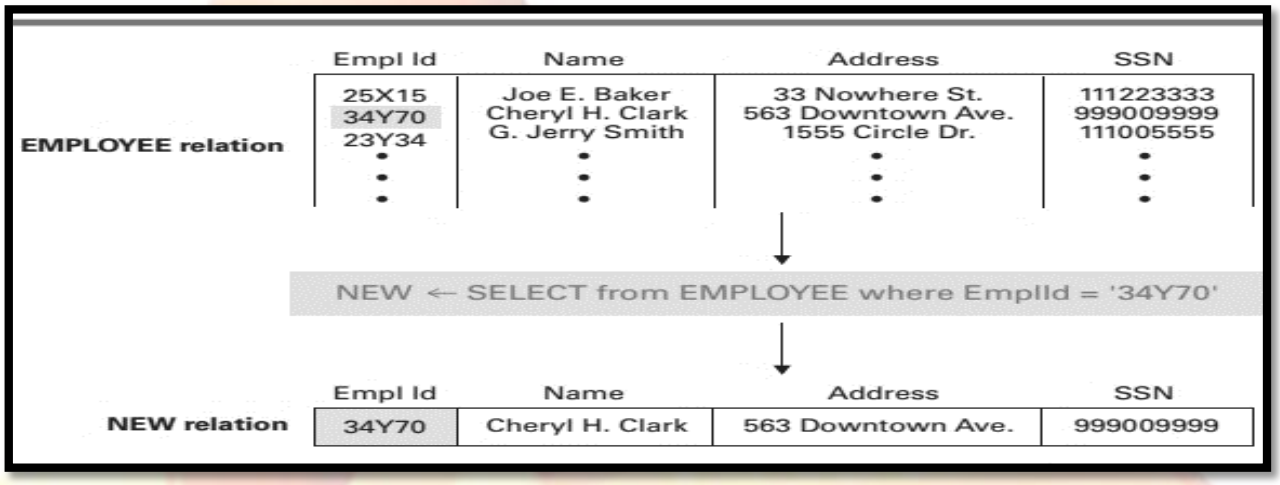


Figure 113: The SELECT operation

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Module 157

96. Database Systems: project Operation

In contrast to the SELECT operation, which extracts rows from a relation, the PROJECT operation extracts columns. Suppose, for example, that in searching for the job titles in a certain department, we had already selected the tuples from the JOB relation that pertained to the target department and placed these tuples in a new relation called NEW1. The list we are seeking is the JobTitle column within this new relation. The PROJECT operation allows us to extract this column (or columns if required) and place the result in a new relation. We express such an operation as

NEW2 <- PROJECT JobTitle from NEW1

The result is the creation of another new relation (called NEW2) that contains the single column of values from the JobTitle column of relation NEW1.

As another example of the PROJECT operation, the statement

MAIL <- PROJECT Name, Address from EMPLOYEE

can be used to obtain a listing of the names and addresses of all employees. This list is in the newly created (two-column) relation called MAIL (Figure 114).

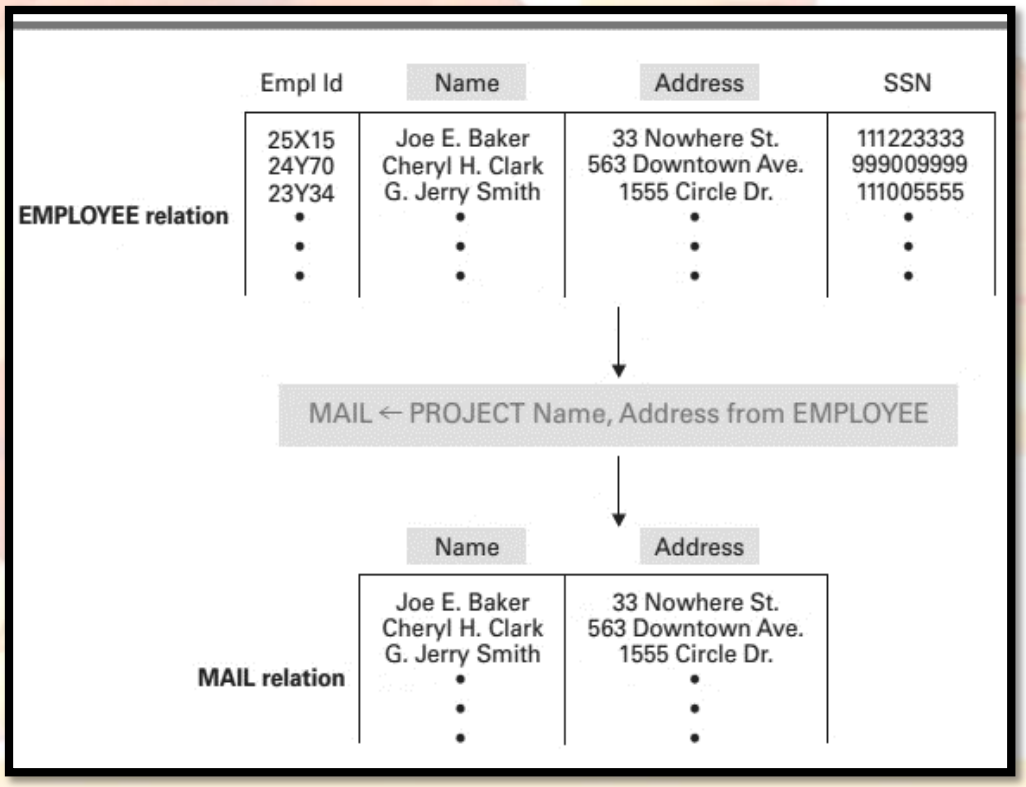


Figure 114: The PROJECT operation

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Module 158

97. Database Systems: Join Operation

Another operation used in conjunction with relational databases is the JOIN operation. It is used to combine different relations into one relation. The JOIN of two relations produces a new relation whose attributes consist of the attributes from the original relations (Figure 115). The names of these attributes are the same as those in the original relations except that each is prefixed by the relation of its origin. (If relation A containing attributes V and W is JOINed with relation B containing attributes X, Y, and Z, then the result has five attributes named A.V, A.W, B.X, B.Y, and B.Z.) This naming convention ensures that the attributes in the new relation have unique names, even though the original relations might have attribute names in common. The tuples (rows) of the new relation are produced by concatenating tuples from the two original relations (see again Figure 115). Which tuples are actually joined to form tuples in the new relation is determined by the condition under which the JOIN is constructed? One such condition is that designated attributes have the same value. This, in fact, is the case represented in Figure 115, where we demonstrate the result of executing the statement

C <- JOIN A and B where A.W = B.X

In this example, a tuple from relation A should be concatenated with a tuple from relation B in exactly those cases where the attributes W and X in the two tuples are equal. Thus the concatenation of the tuple (r, 2) from relation A with the tuple (2, m, q) from relation B appears in the result because the value of attribute W in the first equals the value of attribute X in the second. On the other hand, the result of concatenating the tuple (r, 2) from relation A with the tuple (5, g, p) from relation B does not appear in the final relation because these tuples do not share common values in attributes W and X.

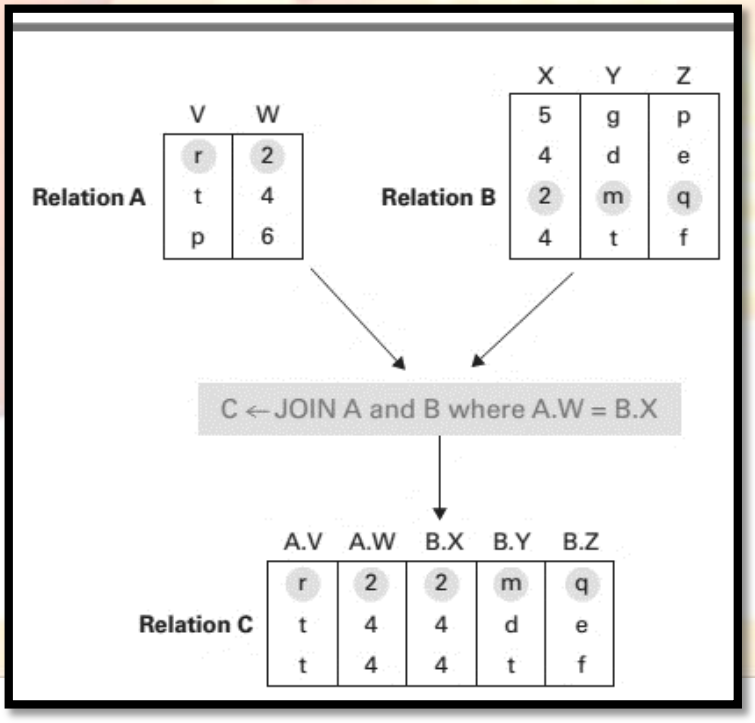


Figure 115: The Join Operation

As another example, Figure 116 represents the result of executing the statement

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C <- JOIN A and B where A.W < B.X

Note that the tuples in the result are exactly those in which attribute W in relation

A is less than attribute X in relation B.

Let us now see how the JOIN operation can be used with the database of Figure 112 to obtain a listing of all employee identification numbers along with the department in which each employee works. Our first observation is that the information required is distributed over more than one relation, and thus the process of retrieving the information must entail more than SELECTions and PROJECTions. In fact, the tool we need is the statement

NEW1 <-JOIN ASSIGNMENT and JOB

where ASSIGNMENT.JobId = JOB.JobId

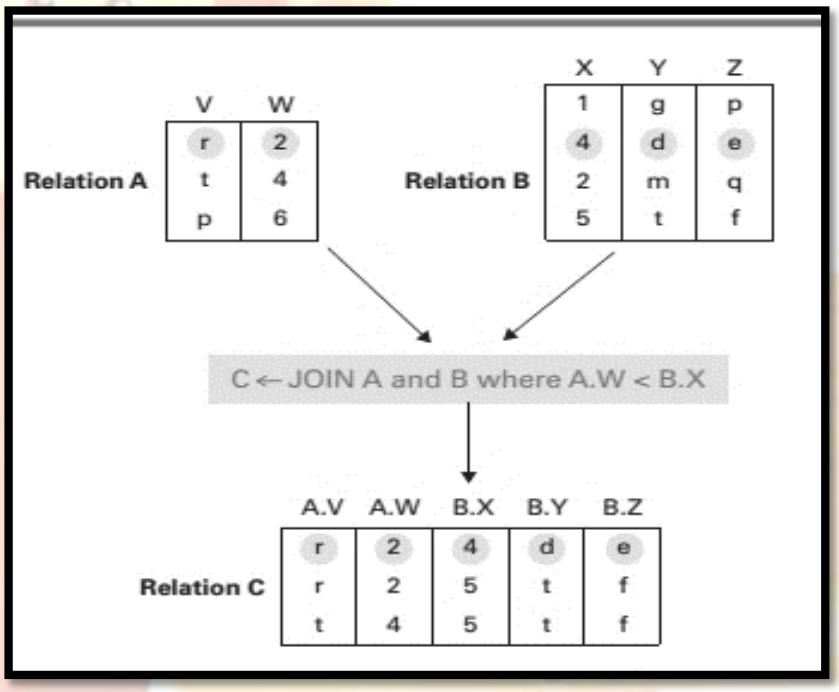


Figure 116: Another example of the JOIN operation

that produces the relation NEW1, as shown in Figure 117. From this relation, our problem can be solved by first SELECTing those tuples in which ASSIGNMENT. TermDate equals '*' (which indicates "still employed") and then PROJECTing the attributes ASSIGNMENT.EmplId and JOB.Dept. In short, the information we need can be obtained from the database in Figure 112 by executing the sequence

NEW1 <-JOIN ASSIGNMENT and JOB

where ASSIGNMENT.JobId = JOB.JobId

NEW2 <- SELECT from NEW1 where ASSIGNMENT.TermDate = '*'

LIST <- PROJECT ASSIGNMENT.EmplId, JOB.Dept from NEW2

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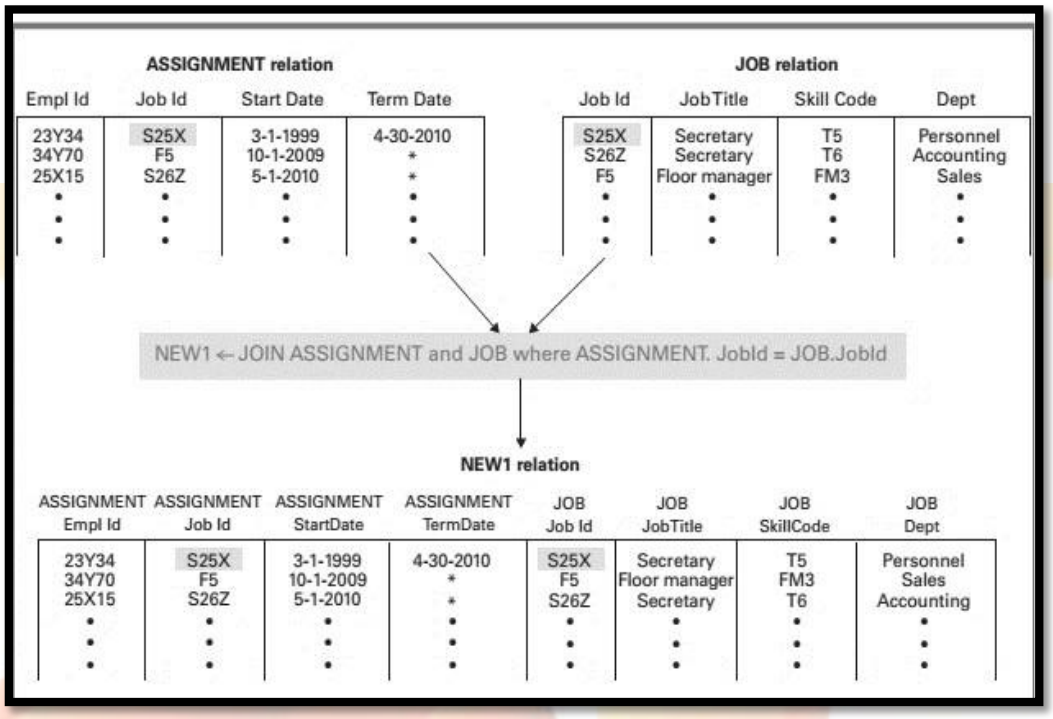


Figure 117: An application of the JOIN operation

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Module 159

98. Database Systems: Object Oriented Databases

Another database model is based on the object-oriented paradigm. This approach leads to an object-oriented database consisting of objects that are linked to each other to reflect their relationships. For example, an object-oriented implementation of the employee database from the previous section could consist of three classes (types of objects): Employee, Job, and Assignment. An object from the Employee class could contain such entries as EmplId, Name, Address, and SSNum; an object from the class Job could contain such entries as JobId, JobTitle, SkillCode, and Dept; and each object from the class Assignment could contain entries such as StartDate and TermDate.

A conceptual representation of such a database is shown in Figure 118 where the links between the various objects are represented by lines connecting the related objects. If we focus on an object of type Employee, we find it linked to a collection of objects of type Assignment representing the various assignments that that particular employee has held. In turn, each of these objects of type Assignment is linked to an object of type Job representing the job associated with that assignment. Thus, all the assignments of an employee can be found by following the links from the object representing that employee. Similarly, all the employees who have held a particular job can be found by following the links from the object representing that job.

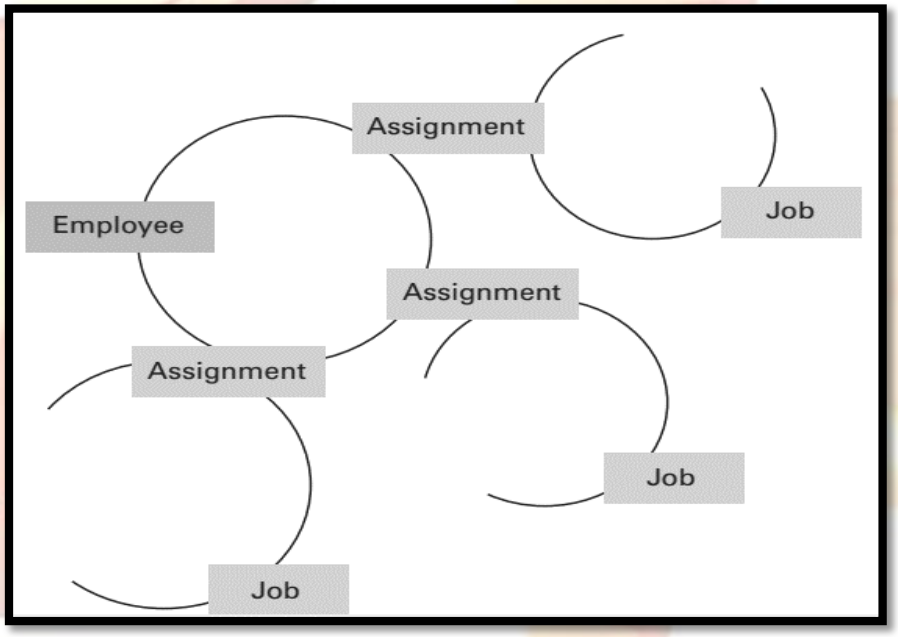


Figure 118: The associations between objects in an object-oriented database

The links between objects in an object-oriented database are normally maintained by the DBMS, so the details of how these links are implemented are not a concern of the programmer writing application software. Instead, when a new object is added to the database, the application software merely specifies the other objects to which it should be linked. The DBMS then creates any linkage system that might be required to record these associations. In particular, a DBMS might link the objects representing the assignments of a given employee in a manner similar to a linked list.

Another task of an object-oriented DBMS is to provide permanent storage for the objects entrusted to it—a requirement that might seem obvious but is inherently distinct from the manner in which objects are normally treated. Normally, when an object-oriented program is executed, the objects created during the program's execution are discarded when the program terminates. In this sense the objects are considered

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transient. But objects that are created and added to a database must be saved after the program that created them terminates. Such objects are said to be **persistent.** Thus, creating persistent objects is a significant departure from the norm.

Proponents of object-oriented databases offer numerous arguments to show why the object-oriented approach to database design is better than the relational approach. One is that the object-oriented approach allows the entire software sys- tem (application software, DBMS, and the database itself) to be designed in the same paradigm. This is in contrast to the historically common practice of using an imperative programming language to develop application software for interrogating a relational database. Inherent in such a task is the clash between imperative and relational paradigms. This distinction is subtle at our level of study, but the difference has been the source of many software errors over the years. Even at our level, we can appreciate that an object-oriented database combined with an objected-oriented application program produces a homogeneous image of objects communicating with each other throughout the system. On the other hand, a relational database combined with an imperative application program conjures an image of two inherently different organizations trying to find a common interface. To appreciate another advantage that object-oriented databases have over their relational counterparts, consider the problem of storing employee names in a relational database. If an entire name is stored as a single attribute in a relation, then inquiries regarding only surnames are awkward. However, if the name is stored as individual attributes, such as first name, middle name, and surname, then the number of attributes becomes problematic because not all names con- form to a specific structure—even when the population is restricted to a single culture. In an object-oriented database, these issues can be hidden within the object that holds the employee's name. An employee's name can be stored as an intelligent object that is capable of reporting the related employee's name in a variety of formats. Thus, from outside these objects, it would be just as easy to deal with only surnames as with entire names, maiden names, or nicknames. The details involved with each perspective would be encapsulated within the objects. This ability to encapsulate the technicalities of different data formats is advantageous in other cases as well. In a relational database, the attributes in a relation are part of the overall design of the database, and thus the types associated with these attributes permeate the entire DBMS. (Variables for temporary storage must be declared to be the appropriate type, and functions for manipulating data of the various types must be designed.) Thus, extending a relational database to include attributes of new types (audio and video) can be problematic. In particular, a variety of functions throughout the database design might need to be expanded to incorporate these new data types. In an object-oriented design, however, the same functions used to retrieve an object representing an employee's name can be used to retrieve an object representing a motion picture because the distinctions in type can be hidden within the objects involved. Thus, the object-oriented approach appears to be more compatible with the construction of multimedia databases—a feature that is already proving to be a great advantage.

Still another advantage the object-oriented paradigm offers to database design is the potential for storing intelligent objects rather than merely data. That is, an object can contain methods describing how it should respond to messages regarding its contents and relationships. For example, each object of the class Employee in Figure 118 could contain methods for reporting and updating the information in the object as well as a method for reporting that employee's job history and perhaps a method for changing that employee's job assignment. Likewise, each object from the Job class could have a method for reporting the specifics of the job and perhaps a method for reporting those employees who have held that particular job. Thus, to retrieve an employee's job history, we would not need to construct an elaborate function. Instead, we could merely ask the appropriate employee object to report its job history. This ability to construct databases whose components respond intelligently to inquiries offers an exciting array of possibilities beyond those of more traditional relational databases.

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Module 160

99. Database Systems: Maintaining DB Integrity

Inexpensive database management systems for personal use are relatively simple systems. They tend to have a single objective—to shield the user from the technical details of the database implementation. The databases maintained by these systems are relatively small and generally contain information whose loss or corruption would be inconvenient rather than disastrous. When a problem does arise, the user can usually correct the erroneous items directly or reload the database from a backup copy and manually make the modifications required to bring that copy up to date. This process might be inconvenient, but the cost of avoiding the inconvenience tends to be greater than the inconvenience itself. In any case, the inconvenience is restricted to only a few people, and any financial loss is generally limited.

In the case of large, multiuser, commercial database systems, however, the stakes are much higher. The cost of incorrect or lost data can be enormous and can have devastating consequences. In these environments, a major role of the DBMS is to maintain the database's integrity by guarding against problems such as operations that for some reason are only partially completed or different operations that might interact inadvertently to cause inaccurate information in the database.

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Module 161

100. Database Systems: The Commit/Rollback Protocol

A single transaction, such as the transfer of funds from one bank account to another, the cancellation of an airline reservation, or the registration of a student in a university course, might involve multiple steps at the database level. For example, a transfer of funds between bank accounts requires that the balance in one account be decremented and the balance in the other be incremented. Between such steps the information in the database might be inconsistent. Indeed, funds are missing during the brief period after the first account has been decremented but before the other has been incremented. Likewise, when reassigning a passenger's seat on a flight, there might be an instant when the passenger has no seat or an instant when the passenger list appears to be one passenger greater than it actually is.

In the case of large databases that are subject to heavy transaction loads, it is highly likely that a random snapshot will find the database in the middle of some transaction. A request for the execution of a transaction or an equipment malfunction will therefore likely occur at a time when the database is in an inconsistent state.

Let us first consider the problem of a malfunction. The goal of the DBMS is to ensure that such a problem will not freeze the database in an inconsistent state. This is often accomplished by maintaining a log containing a record of each transaction's activities in a nonvolatile storage system, such as a magnetic disk. Before a transaction is allowed to alter the database, the alteration to be performed is first recorded in the log. Thus the log contains a permanent record of each transaction's actions.

The point at which all the steps in a transaction have been recorded in the log is called the **commit point.** It is at this point that the DBMS has the information it needs to reconstruct the transaction on its own if that should become necessary. At this point the DBMS becomes committed to the transaction in the sense that it accepts the responsibility of guaranteeing that the transaction's activities will be reflected in the database. In the case of an equipment malfunction, the DBMS can use the information in its log to reconstruct the transactions that have been completed (committed) since the last backup was made.

If problems should arise before a transaction has reached its commit point, the DBMS might find itself with a partially executed transaction that cannot be completed. In this case the log can be used to **roll back** (undo) the activities actually performed by the transaction. In the case of a malfunction, for instance, the DBMS could recover by rolling back those transactions that were incomplete (non-committed) at the time of the malfunction.

Rollbacks of transactions are not restricted, however, to the process of recovering from equipment malfunctions. They are often a part of a DBMS's normal operation. For example, a transaction might be terminated before it has completed all its steps because of an attempt to access privileged information, or it might be involved in a deadlock in which competing transactions find themselves waiting for data being used by each other. In these cases, the DBMS can use the log to roll back a transaction and thus avoid an erroneous database due to incomplete transactions.

To emphasize the delicate nature of DBMS design, we should note that there are subtle problems lurking within the rollback process. The rolling back of one transaction might affect database entries that have been used by other transactions. For example, the transaction being rolled back might have updated an account balance, and another transaction might have already based its activities on this updated value. This might mean that these additional transactions must also be rolled back, which might adversely affect still other transactions. The result is the problem known as **cascading rollback.**

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Module 162

101. Database Systems: Locking

We now consider the problem of a transaction being executed while the database is in a state of flux from another transaction, a situation that can lead to inadvertent interaction between the transactions and produce erroneous results. For instance, the problem known as the **incorrect summary problem** can arise if one transaction is in the middle of transferring funds from one account to another when another transaction tries to compute the total deposits in the bank. This could result in a total that is either too large or too small depending on the order in which the transfer steps are performed. Another possibility is known as the **lost update problem,** which is exemplified by two transactions, each of which makes a deduction from the same account. If one transaction reads the account's current balance at the point when the other has just read the balance but has not yet calculated the new balance, then both transactions will base their deductions on the same initial balance. In turn, the effect of one of the deductions will not be reflected in the database.

To solve such problems, a DBMS could force transactions to execute in their entirety on a one-at-a-time basis by holding each new transaction in a queue until those preceding it have completed. But a transaction often spends a lot of time waiting for mass storage operations to be performed. By inter- weaving the execution of transactions, the time during which one transaction is waiting can be used by another transaction to process data it has already retrieved. Most large database management systems therefore contain a scheduler to coordinate time-sharing among transactions in much the same way that a multiprogramming operating system coordinates interweaving of processes.

To guard against such anomalies as the incorrect summary problem and the lost update problem, these schedulers incorporate a **locking protocol** in which the items within a database that are currently being used by some transaction are marked as such. These marks are called locks; marked items are said to be locked. Two types of locks are common—**shared locks** and **exclusive locks.** They correspond to the two types of access to data that a transaction might require—shared access and exclusive access. If a transaction is not going to alter a data item, then it requires shared access, meaning that other transactions are also allowed to view the data. However, if the transaction is going to alter the item, it must have exclusive access, meaning that it must be the only transaction with access to that data.

In a locking protocol, each time a transaction requests access to a data item, it must also tell the DBMS the type of access it requires. If a transaction requests shared access to an item that is either unlocked or locked with a shared lock, that access is granted, and the item is marked with a shared lock. If, however, the requested item is already marked with an exclusive lock, the additional access is denied. If a transaction requests exclusive access to an item, that request is granted only if the item has no lock associated with it. In this manner, a transaction that is going to alter data protects that data from other transactions by obtaining exclusive access, whereas several transactions can share access to an item if none of them are going to change it. Of course, once a transaction is finished with an item, it notifies the DBMS, and the associated lock is removed.

Various algorithms are used to handle the case in which a transaction's access request is rejected. One algorithm is that the transaction is merely forced to wait until the requested item becomes available. This approach, however, can lead to deadlock, since two transactions that require exclusive access to the same two data items could block each other's progress if each obtains exclusive access to one of the items and then insists on waiting for the other. To avoid such dead- locks, some database management systems give priority to older transactions. That is, if an older transaction requires access to an item that is locked by a younger transaction, the younger transaction is forced to release all of its data items, and its activities are rolled back (based on the log). Then, the older transaction is given access to the item it required, and the younger transaction is forced to start again. If a younger transaction is repeatedly preempted, it will grow older in the process and ultimately become one of the older transactions with high priority. This protocol,

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known as the **wound-wait protocol** (old transactions wound young transactions, young transactions wait for old ones), ensures that every transaction will ultimately be allowed to complete its task.

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Module 163

102. Database Systems: Sequential Files

A **sequential file** is a file that is accessed in a serial manner from its beginning to its end as though the information in the file were arranged in one long row. Examples include audio files, video files, files containing programs, and files containing textual documents. In fact, most of the files created by a typical personal computer user are sequential files. For instance, when a spreadsheet is saved, its information is encoded and stored as a sequential file from which the spreadsheet application software can reconstruct the spreadsheet.

Text files, which are sequential files in which each logical record is a single symbol encoded using ASCII or Unicode, often serve as a basic tool for constructing more elaborate sequential files such as an employee records file. One only needs to establish a uniform format for representing the information about each employee as a string of text, encode the information according to that format, and then record the resulting employee records one after another as one single string of text. For example, one could construct a simple employee file by agreeing to enter each employee record as a string of 31 characters, consisting of a field of 25 characters contain- ing the employee's name (filled with enough blanks to complete the 25-character field), followed by a field of 6 characters representing the employee's identification number. The final file would be a long string of encoded characters in which each 31-character block represents the information about a single employee (Figure 119). Information would be retrieved from the file in terms of logical records consisting of 31-character blocks. Within each of these blocks, individual fields would be identi- fied according to the uniform format with which the blocks were constructed.

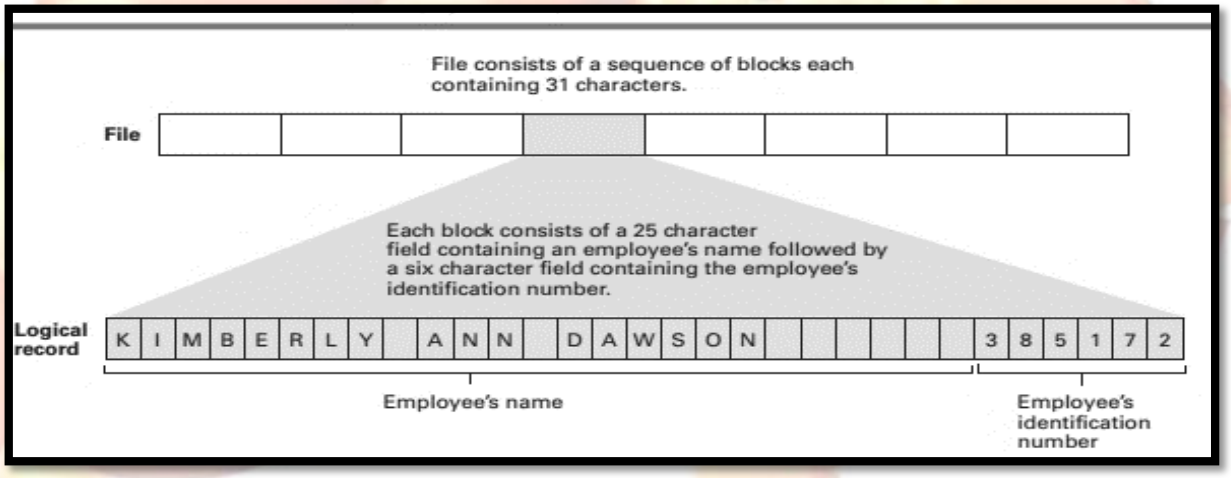


Figure 119: The structure of a simple employee file implemented as a text file

The data in a sequential file must be recorded in mass storage in such a way that the sequential nature of the file is preserved. If the mass storage system is itself sequential (as in the case of a magnetic tape or CD), this is a straightforward undertaking. We need merely record the file on the storage medium according to the sequential properties of the medium. Then processing the file is the task of merely reading and processing the file's contents in the order in which they are found. This is exactly the process followed in playing audio CDs, where the music is stored as a sequential file sector by sector along one continuous spiraling track.

In the case of magnetic disk storage, however, the file would be scattered over different sectors that could be retrieved in a variety of orders. To preserve the proper order, most operating systems (more precisely, the file manager) maintain a list of the sectors on which the file is stored. This list is recorded as part of the

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disk's directory system on the same disk as the file. By means of this list, the operating system can retrieve the sectors in the proper sequence as though the file were stored sequentially, even though the file is actually distributed over various portions of the disk.

Inherent in processing a sequential file is the need to detect when the end of the file is reached. Generically, we refer to the end of a sequential file as the **end-of-file (EOF).** There are a variety of ways of identifying the EOF. One is to place a special record, called a **sentinel,** at the end of the file. Another is to use the information in the operating system's directory system to identify a file's EOF. That is, since the operating system knows which sectors contain the file, it also knows where the file terminates. A classic example involving sequential files is payroll processing in a small company. Here we imagine a sequential file consist- ing of a series of logical records, each of which contains the information about an employee's pay (name, employee identification number, pay scale, and so on) from which checks must be printed on a routine basis. As each employee record is retrieved, that employee's pay is calculated, and the appropriate check produced.

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Module 164

103. Database Systems: Indexed Files

Sequential files are ideal for storing data that will be processed in the order in which the file's entries are stored. However, such files are inefficient when records within the file must be retrieved in an unpredictable order. In such situations what is needed is a way to identify the location of the desired logical record quickly. A popular solution is to use an index for the file in much the same way that an index in a book is used to locate topics within the book. Such a file system is called an indexed file.

An index for a file contains a list of the keys stored in the file along with entries indicating where the record containing each key is stored. Thus to find a particular record, one finds the identifying key in the index and then retrieves the block of information stored at the location associated with that key.

A file's index is normally stored as a separate file on the same mass storage device as the indexed file. The index is usually transferred to main memory before file processing begins so that it is easily accessible when access to records in the file is required (Figure 120).

A classic example of an indexed file occurs in the context of maintaining employee records. Here an index can be used to avoid lengthy searches when you are retrieving an individual record. In particular, if the file of employee records is indexed by employee identification numbers, then an employee's record can be retrieved quickly when the employee's identification number is known. Another example is found on audio CDs where an index is used to allow relatively quick access to individual recordings.

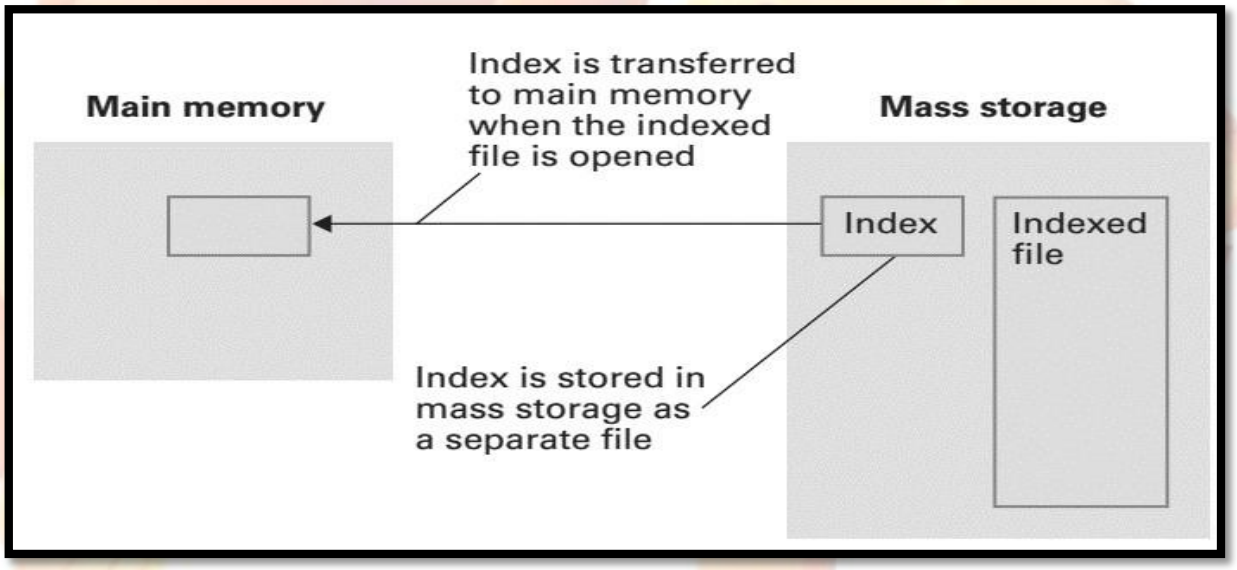


Figure 120: Opening an indexed file

Over the years numerous variations of the basic index concept have been used. One variation constructs an index in a hierarchical manner so that the index takes on a layered or tree structure. A prominent example is the hierarchical directory system used by most operating systems for organizing file storage. In such a case, the directories, or folders, play the role of indexes, each containing links to its sub-indexes. From this perspective, the entire file system is merely one large indexed file.

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104. Database Systems: Hash Files

Although indexing provides relatively quick access to entries within a data storage structure, it does so at the expense of index maintenance. **Hashing** is a technique that provides similar access without such overhead. As in the case of an indexed system, hashing allows a record to be located by means of a key value. But, rather than looking up the key in an index, hashing identifies the location of the record directly from the key.

A hash system can be summarized as follows: The data storage space is divided into several sections, called **buckets,** each of which is capable of holding several records. The records are dispersed among the buckets according to an algorithm that converts key values into bucket numbers. (This conversion from key values to bucket numbers is called a **hash function.**) Each record is stored in the bucket identified by this process. Therefore, a record that has been placed in the storage structure can be retrieved by first applying the hash function to the record's identifying key to determine the appropriate bucket, then retrieving the contents of that bucket, and finally searching through the data retrieved for the desired record.

Hashing is not only used as a means of retrieving data from mass storage but also as a means of retrieving items from large blocks of data stored in main memory. When hashing is applied to a storage structure in mass storage, the result is called a **hash file.** When applied to a storage structure within main memory, the result is usually called a **hash table.**

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105. Database Systems: Hash File Example

Let us apply the hashing technique to the classic employee file in which each record contains information about a single employee in a company. First, we establish several available areas of mass storage that will play the role of buckets. The number of buckets and the size of each bucket are design decisions that we will consider later. For now, let us assume that we have created 41 buckets, which we refer to as bucket number 0, bucket number 1, through bucket number 40. (The reason we selected 41 buckets rather than an even 40 will be explained shortly.)

Let us assume that an employee's identification number will be used as the key for identifying the employee's record. Our next task, then, is to develop a hash function for converting these keys into bucket numbers. Although the employee identification "numbers" might have the form 25X3Z or J2X35 and are therefore not numeric, they are stored as bit patterns, and we can interpret the bit patterns as numbers. Using this numeric interpretation, we can divide any key by the number of buckets available and record the remainder, which in our case will be an integer in the range from 0 to 40. Thus we can use the remainder of this division process to identify one of the 41 buckets (Figure 121).

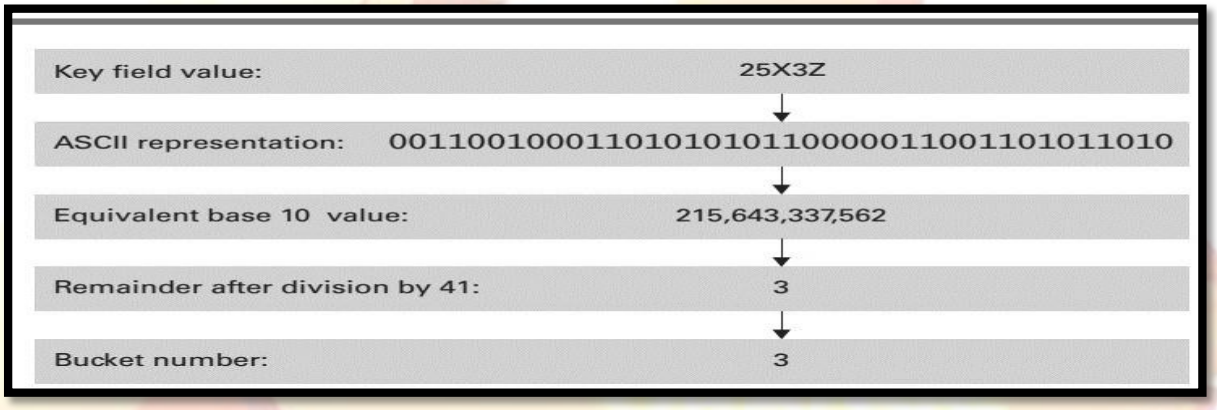


Figure 121: Hashing the key field value 25X3Z to one of 41 buckets

Using this as our hash function, we proceed to construct the file by considering each record individually, applying our divide-by-41 hash function to its key to obtain a bucket number, and then storing the record in that bucket (Figure 122). Later, if we need to retrieve a record, we need merely apply our hash function to the record's key to identify the appropriate bucket and then search that bucket for the record in question.

At this point let us reconsider our decision to divide the storage area into 41 buckets. First, note that to obtain an efficient hash system, the records being stored should be distributed evenly among the buckets. If a disproportionate num- ber of keys happen to hash to the same bucket (a phenomenon called **clustering**), then a disproportionate number of records will be stored in a single bucket. In turn, retrieving a record from that bucket could require a time-consuming search, causing the loss of any benefits gained by hashing.

Now observe that if we had chosen to divide the storage area into 40 buckets rather than 41, our hash function would have involved dividing the keys by the value 40 rather than 41. But, if a dividend and a divisor both have a common factor, that factor will be present in the remainder as well. In particular, if the keys to the entries stored in our hash file happened to be multiples of 5 (which is also a divisor of 40), then the factor of 5 would appear in the remainders when divided by 40, and the entries would cluster in those buckets associated with the remainders 0, 5, 10, 15, 20, 25, 30, and 35. Similar situations would occur in the case of keys that are multiples of 2, 4, 8, 10, and 20, because they are all also fac- tors of 40.

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Consequently, we choose to divide the storage area into 41 buckets because the choice of 41, being a prime number, eliminated the possibility of common factors and therefore reduced the chance of clustering.

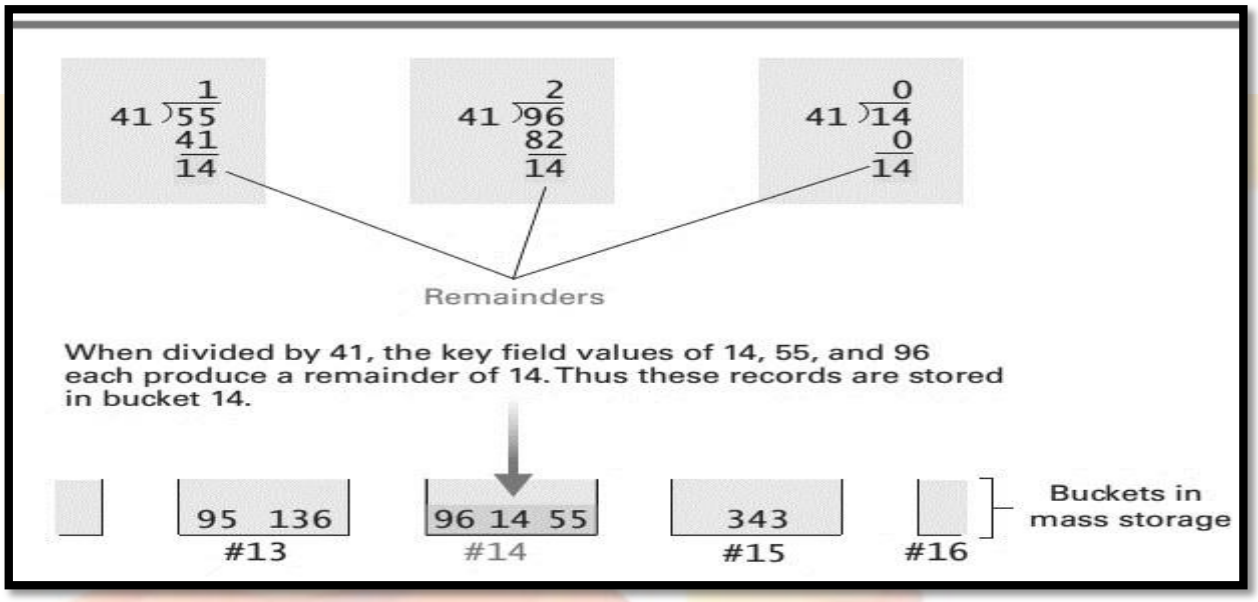


Figure 122: The rudiments of a hashing system

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Module 167

106. Database Systems: Data Mining

A rapidly expanding subject that is closely associated with database technology is data mining, which consists of techniques for discovering patterns in collections of data. Data mining has become an important tool in numerous areas including marketing, inventory management, quality control, loan risk management, fraud detection, and investment analysis. Data mining techniques even have applications in what might seem unlikely settings as exemplified by their use in identifying the functions of particular genes encoded in DNA molecules and characterizing properties of organisms.

Data mining activities differ from traditional database interrogation in that data mining seeks to identify previously unknown patterns as opposed to traditional database inquiries that merely ask for the retrieval of stored facts. More- over, data mining is practiced on static data collections, called **data warehouses,** rather than "online" operational databases that are subject to frequent updates. These warehouses are often "snapshots" of databases or collections of databases. They are used in lieu of the actual operational databases because finding patterns in a static system is easier than in a dynamic one.

We should also note that the subject of data mining is not restricted to the domain of computing but has tentacles that extend far into statistics. In fact, many would argue that since data mining had its origins in attempts to perform statistical analysis on large, diverse data collections, it is an application of statistics rather than a field of computer science.

Two common forms of data mining are **class description** and **class discrimination.** Class description deals with identifying properties that characterize a given group of data items, whereas class discrimination deals with identifying properties that divide two groups. For example, class description techniques would be used to identify characteristics of people who buy small economical vehicles, whereas class discrimination techniques would be used to find proper- ties that distinguish customers who shop for used cars from those who shop for new ones.

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107. Database Systems: Data Mining Examples and Implications

Another form of data mining is **cluster analysis,** which seeks to discover classes. Note that this differs from class description, which seeks to discover properties of members within classes that are already identified. More precisely, cluster analysis tries to find properties of data items that lead to the discovery of groupings. For example, in analyzing information about people's ages who have viewed a particular motion picture, cluster analysis might find that the customer base breaks down into two age groups—a 4-to-0 age group and a 25-to-40 age group. (Perhaps the motion picture attracted children and their parents?)

Still another form of data mining is **association analysis,** which involves looking for links between data groups. It is association analysis that might reveal that customers who buy potato chips also buy beer and soda or that people who shop during the traditional weekday work hours also draw retirement benefits.

Outlier analysis is another form of data mining. It tries to identify data entries that do not comply with the norm. Outlier analysis can be used to identify errors in data collections, to identify credit card theft by detecting sudden deviations from a customer's normal purchase patterns, and perhaps to identify potential terrorists by recognizing unusual behavior.

Finally, the form of data mining called **sequential pattern analysis** tries to identify patterns of behavior over time. For example, sequential pattern analysis might reveal trends in economic systems such as equity markets or in environ- mental systems such as climate conditions.

As indicated by our last example, results from data mining can be used to predict future behavior. If an entity possesses the properties that characterize a class, then the entity will probably behave like members of that class. However, many data mining projects are aimed at merely gaining a better understanding of the data, as witnessed by the use of data mining in unraveling the mysteries of DNA. In any case, the scope of data mining applications is potentially enormous, and thus data mining promises to be an active area of research for years to come. Note that database technology and data mining are close cousins, and thus research in one will have repercussions in the other. Database techniques are used extensively to give data warehouses the capability of presenting data in the form of **data cubes** (data viewed from multiple perspectives—the term *cube* is used to conjecture the image of multiple dimensions) that make data mining possible. In turn, as researchers in data mining improve techniques for implementing data cubes, these results will pay dividends in the field of database design.

In closing, we should recognize that successful data mining encompasses much more than the identification of patterns within a collection of data. Intelligent judgment must be applied to determine whether those patterns are significant or merely coincidences. The fact that a particular convenience store has sold a high number of winning lottery tickets should probably not be considered significant to someone planning to buy a lottery ticket, but the discovery that customers who buy snack food also tend to buy frozen dinners might constitute meaningful information to a grocery store manager. Likewise, data mining encompasses a vast number of ethical issues involving the rights of individuals represented in the data warehouse, the accuracy and use of the conclusions drawn, and even the appropriateness of data mining in the first place.

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108. Database Systems: Social Impact of Database Technology

With the development of database technology, information that was once buried in arcane records has become accessible. In many cases, automated library systems place a patron's reading habits within easy reach, retailers maintain records of their customers' purchases, and Internet search engines keep records of their clients' requests. In turn this information is potentially available to marketing firms, law enforcement agencies, political parties, employers, and private individuals.

This is representative of the potential problems that permeate the entire spectrum of database applications. Technology has made it easy to collect enormous amounts of data and to merge or compare different data collections to obtain relationships that would otherwise remain buried in the heap. The ramifications, both positive and negative, are enormous. These ramifications are not merely subjects for academic debate—they are realities.

In some cases, the data collection process is readily apparent; in others it is subtle. Examples of the first case occur when one is explicitly asked to provide information. This may be done in a voluntary manner, as in surveys or contest registration forms, or it may be done in an involuntary manner, such as when imposed by government regulations. Sometimes whether it is voluntary depends on one's point of view. Is providing personal information when applying for a loan voluntary or involuntary? The distinction depends on whether receiving the loan is a convenience or a necessity. To use a credit card at some retailers now requires that you allow your signature to be recorded in a digitized format. Again, providing the information is either voluntary or involuntary depending on your situation.

More subtle cases of data collection avoid direct communication with the subject. Examples include a credit company that records the purchasing practices of the holders of its credit cards, websites that record the identities of those who visit the site, and social activists who record the license plate numbers on the cars parked in a targeted institution's parking lot. In these cases, the subject of the data collection might not be aware that information is being collected and less likely to be aware of the existence of the databases being constructed.

Sometimes the underlying data-collection activities are self-evident if one merely stops to think. For example, a grocery store might offer discounts to its regular customers who register in advance with the store. The registration process might involve the issuance of identification cards that must be presented at the time of purchase to obtain the discount. The result is that the store is able to compile a record of the customers' purchases—a record whose value far exceeds the value of the discounts awarded.

Of course, the force driving this boom in data collection is the value of the data, which is amplified by advances in database technology that allow data to be linked in ways that reveal information that would otherwise remain obscure. For example, the purchasing patterns of credit card holders can be classified and cross-listed to obtain customer profiles of immense marketing value. Subscription forms for body-building magazines can be mailed to those who have recently purchased exercise equipment, whereas subscription forms for dog obedience magazines can be targeted toward those who have recently purchased dog food. Alternative ways of combining information are sometimes very imaginative. Welfare records have been compared to criminal records to find and apprehend parole violators, and in 1984 the Selective Service in the United States used old birthday registration lists from a popular ice cream retailer to identify citizens who had failed to register for the military draft.

There are several approaches to protecting society from abusive use of data- bases. One is to apply legal remedies. Unfortunately, passing a law against an action does not stop the action from occurring but merely makes the action illegal. A prime example in the United States is the Privacy Act of 1974 whose purpose was to protect citizens from abusive use of government databases. One provision of this act required

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government agencies to publish notice of their databases in the Federal Register to allow citizens to access and correct their personal information. However, government agencies were slow to comply with this provision. This does not necessarily imply malicious intent. In many cases the problem was one of bureaucracy. But the fact that a bureaucracy might be constructing personnel databases that it is unable to identify is not reassuring.

Another, and perhaps more powerful, approach to controlling database abuse is public opinion. Databases will not be abused if the penalties outweigh the benefits; and the penalty businesses fear the most is adverse public opinion—this goes right to the bottom line. In the early 1990s it was public opinion that ultimately stopped major credit bureaus from selling mailing lists for marketing purposes. More recently, Google discontinued its Google Buzz social networking tool in 2011 after its automatic sharing of contact information from the popular Gmail tool was greeted with harsh public criticism. Even government agencies have bowed to public opinion. In 1997 the Social Security Administration in the United States modified its plan to make Social Security records available via the Internet when public opinion questioned the security of the information. In some of these cases results were obtained in days—a stark contrast to the extended time periods associated with legal processes.

Of course, in many cases database applications are beneficial to both the holder and the subject of the data, but in all cases, there is a loss of privacy that should not be taken lightly. Such privacy issues are serious when the information is accurate, but they become gigantic when the information is erroneous. Imagine the feeling of hopelessness if you realized that your credit rating was adversely affected by erroneous information. Imagine how your problems would be amplified in an environment in which this misinformation was readily shared with other institutions. Privacy problems are, and will be, a major side effect of advancing technology in general and database techniques in particular. The solutions to these problems will require an educated, alert, and active citizenry.

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Module 170

109. Artificial Intelligence: Introduction and Vision

Artificial intelligence is the field of computer science that seeks to build autonomous machines - machines that can carry out complex tasks without human intervention. AI is helping to make Robots as shown in the Figure 123, and self-driving cars as shown in the Figure 124.



Figure 123: Robot



Figure 124: Self Driving Cars

Robots can help patients, for example one typical robot shown in the Figure 125 can alleviate a person even 40 times a day.

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Figure 125: Medical robot helping the patients

Pepper Robot works as receptionist in Belgian hospital shown in the Figure 126.

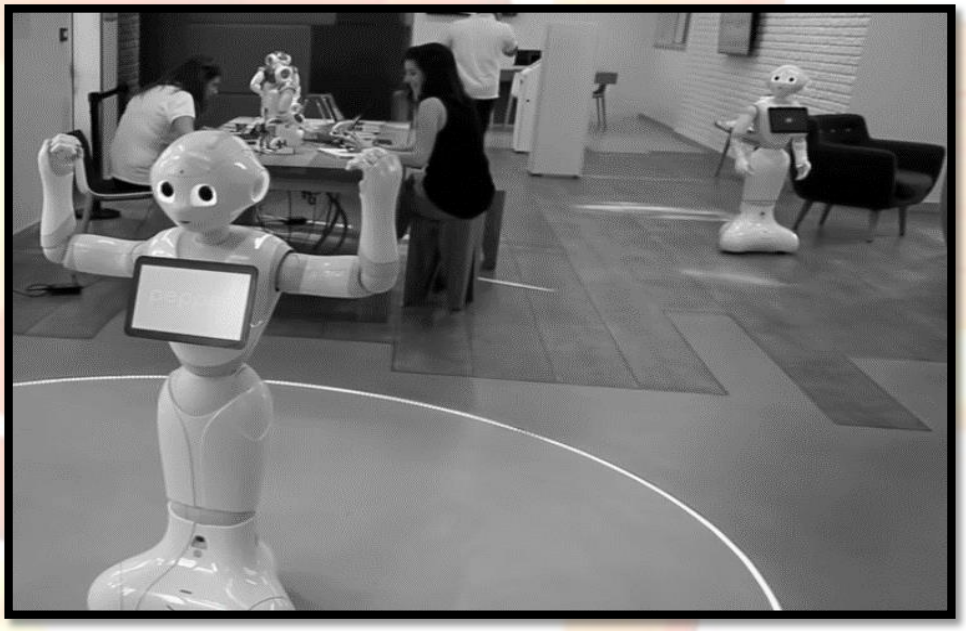


Figure 126: Receptionist Robot

Another robot is shown in the Figure 127. This robot is able to take blood from the veins of the humans and it is more accurate than humans. It performs image processing to locate the veins and further confirmed by the ultrasound.

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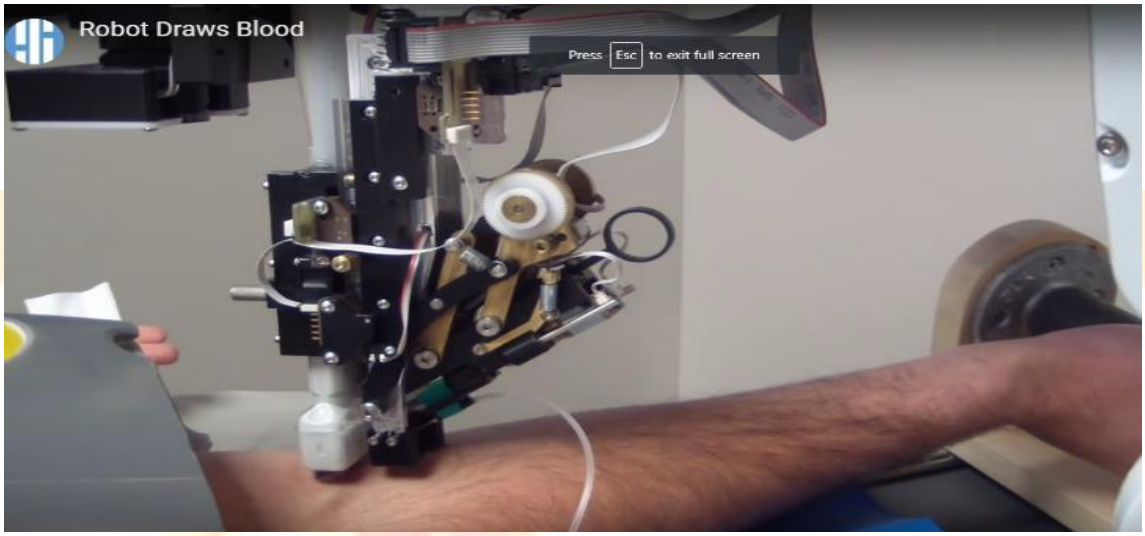


Figure 127: Robot draws blood

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Module 171

110. Artificial Intelligence: Intelligent Agents

An **agent** is a "device" that responds to stimuli from its environment. It is natural to envision an agent as an individual machine such as a robot, although an agent may take other forms such as an autonomous airplane, a character in an interactive video game, or a process communicating with other processes over the Internet (perhaps as a client, a server, or a peer). Most agents have sensors by which they receive data from their environments and actuators by which they can affect their environments. Examples of sensors include microphones, cameras, range sensors, and air or soil sampling devices. Examples of actuators include wheels, legs, wings, grippers, and speech synthesizers.

Much of the research in artificial intelligence can be characterized in the context of building agents that behave intelligently, meaning that the actions of the agent's actuators must be rational responses to the data received though its sensors. In turn, we can classify this research by considering different levels of these responses.

The simplest response is a reflex action, which is merely a predetermined response to the input data. Higher levels of response are required to obtain more "intelligent" behavior. For example, we might empower an agent with knowledge of its environment and require that the agent adjust its actions accordingly. The process of throwing a baseball is largely a reflex action but determining how and where to throw the ball requires knowledge of the current environment. (There is one out with runners on first and third.) How such real-world knowledge can be stored, updated, accessed, and ultimately applied in the decision-making process continues to be a challenging problem in artificial intelligence.

Another level of response is required if we want the agent to seek a goal such as winning a game of chess or maneuvering through a crowded passageway. Such goal-directed behavior requires that the agent's response, or sequence of responses, be the result of deliberately forming a plan of action or selecting the best action among the current options.

In some cases, an agent's responses improve over time as the agent learns. This could take the form of developing **procedural knowledge** (learning "how") or storing **declarative knowledge** (learning "what"). Learning procedural knowledge usually involves a trial-and-error process by which an agent learns appropriate actions by being punished for poor actions and rewarded for good ones. Following this approach, agents have been developed that, over time, improve their abilities in competitive games such as checkers and chess. Learning declarative knowledge usually takes the form of expanding or altering the "facts" in an agent's store of knowledge. For example, a baseball player must repeatedly adjust his or her database of knowledge (there is still just one out, but now runners are on first and second) from which rational responses to future events are determined.

To produce rational responses to stimuli, an agent must "understand" the stimuli received by its sensors. That is, an agent must be able to extract information from the data produced by its sensors, or in other words, an agent must be able to perceive. In some cases, this is a straightforward process. Signals obtained from a gyroscope are easily encoded in forms compatible with calculations for determining responses. But in other cases, extracting information from input data is difficult. Examples include understanding speech and images. Likewise, agents must be able to formulate their responses in terms compatible with their actuators. This might be a straightforward process, or it might require an agent to formulate responses as complete spoken sentences—meaning that the agent must generate speech. In turn, such topics as image processing and analysis, natural language understanding, and speech generation are important areas of research. The agent attributes that we have identified here represent past as well as cur- rent areas of research. Of course, they are not totally independent of each other. We would like to develop agents that possess all of them, producing agents that understand the data received from their environments and develop new response patterns through a learning process whose goal is to maximize the agent's abili- ties.

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However, by isolating various types of rational behavior and pursuing them independently, researchers gain a toehold that can later be combined with progress in other areas to produce more intelligent agents.

We close this subsection by introducing an agent that will provide a context for our discussion in Sections 11.2 and 11.3. The agent is designed to solve the eight-puzzle, which consists of eight square tiles labeled 1 through 8 mounted in a frame capable of holding a total of nine such tiles in three rows and three columns (Figure 128). Among the tiles in the frame is a vacancy into which any of the adjacent tiles can be pushed, allowing the tiles in the frame to be scrambled. The problem posed is to move the tiles in a scrambled puzzle back to their initial positions (Figure 128).

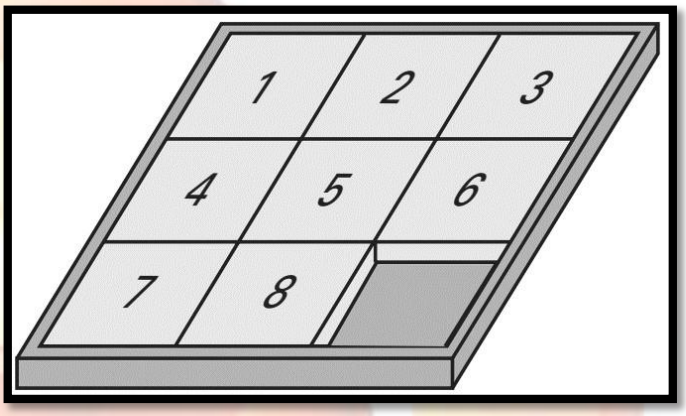


Figure 128: The eight-puzzle in its solved configuration

Our agent takes the form of a box equipped with a gripper, a video camera, and a finger with a rubber end so that it does not slip when pushing something (Figure 129). When the agent is first turned on, its gripper begins to open and close as if asking for the puzzle. When we place a scrambled eight-puzzle in the gripper, the gripper closes on the puzzle. After a short time, the machine's finger lowers and begins pushing the tiles around in the frame until they are back in their original positions. At this point the machine releases the puzzle and turns itself off.

This puzzle-solving machine exhibits two of the agent attributes that we have identified. First, it must be able to perceive in the sense that it must extract the current puzzle state from the image it receives from its camera.

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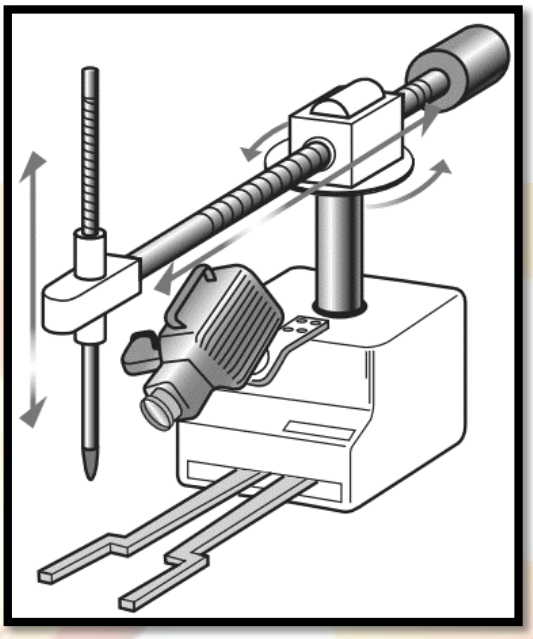


Figure 129: Our puzzle-solving machine

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Module 172

111. Artificial Intelligence: Research Methodologies

To appreciate the field of artificial intelligence, it is helpful to understand that it is being pursued along two paths. One is the engineering track in which researchers are trying to develop systems that exhibit intelligent behavior. The other is a theoretical track in which researchers are trying to develop a computational understanding of animal—especially human—intelligence. This dichotomy is clarified by considering the manner in which the two tracks are pursued. The engineering approach leads to a performance-oriented methodology because the underlying goal is to produce a product that meets certain performance goals. The theoretical approach leads to a simulation-oriented methodology because the underlying goal is to expand our understanding of intelligence and thus the emphasis is on the underlying process rather than the exterior performance.

As an example, consider the fields of natural language processing and linguistics. These fields are closely related and benefit from research in each other, yet the underlying goals are different. Linguists are interested in learning how humans process language and thus tend toward more theoretical pursuits. Researchers in the field of natural language processing are interested in developing machines that can manipulate natural language and therefore lean in the engineering direction. Thus, linguists operate in simulation-oriented mode- building systems whose goals are to test theories. In contrast, researchers in natural language processing operate in performance-oriented mode-building systems to perform tasks. Systems produced in this latter mode (such as document translators and systems by which machines respond to verbal commands) rely heavily on knowledge gained by linguists but often apply "shortcuts" that happen to work in the restricted environment of the particular system.

As an elementary example, consider the task of developing a shell for an operating system that receives instructions from the outside world through verbal English commands. In this case, the shell (an agent) does not need to worry about the entire English language. More precisely, the shell does not need to distinguish between the various meanings of the word *copy.* (Is it a noun or a verb? Should it carry the connotation of plagiarism?) Instead, the shell needs merely to distinguish the word *copy* from other commands such as *rename* and *delete.* Thus, the shell could perform its task just by matching its inputs to predetermined audio patterns. The performance of such a system may be satisfactory to an engineer, but the way it is obtained would not be aesthetically pleasing to a theoretician.

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Module 173

112. Artificial Intelligence: The Turing Test

In the past the **Turing test** (proposed by Alan Turing in 1950) has served as a benchmark in measuring progress in the field of artificial intelligence. Today the significance of the Turing test has faded although it remains an important part of the artificial intelligence folklore. Turing's proposal was to allow a human, whom we call the interrogator, to communicate with a test subject by means of a typewriter system without being told whether the test subject was a human or a machine. In this environment, a machine would be declared to behave intelligently if the interrogator was not able to distinguish it from a human. Turing predicted that by the year 2000 machines would have a 30 percent chance of passing a five-minute Turing test—a conjecture that turned out to be surprisingly accurate.

One reason that the Turing test is no longer considered to be a meaningful measure of intelligence is that an eerie appearance of intelligence can be produced with relative ease. A well-known example arose as a result of the pro- gram DOCTOR (a version of the more general system called ELIZA) developed by Joseph Weizenbaum in the mid-1960s. This interactive program was designed to project the image of a Rogerian analyst conducting a psychological interview; the computer played the role of the analyst while the user played the patient. Internally, all that DOCTOR did was restructure the statements made by the patient according to some well-defined rules and direct them back to the patient. For example, in response to the statement "I am tired today," DOCTOR might have replied with "Why do you think, you are tired today?" If DOCTOR was unable to recognize the sentence structure, it merely responded with something like "Go on" or "That's very interesting."

Weizenbaum's purpose in developing DOCTOR dealt with the study of nat- ural language communication. The subject of psychotherapy merely provided an environment in which the program could "communicate." To Weizenbaum's dismay, however, several psychologists proposed using the program for actual psychotherapy. (The Rogerian thesis is that the patient, not the analyst, should lead the discussion during the therapeutic session, and thus, they argued, a computer could possibly conduct a discussion as well as a therapist could.) Moreover, DOCTOR projected the image of comprehension so strongly that many who "communicated" with it became subservient to the machine's question-and- answer dialogue. In a sense, DOCTOR passed the Turing test. The result was that ethical, as well as technical, issues were raised, and Weizenbaum became an advocate for maintaining human dignity in a world of advancing technology.

More recent examples of Turing test "successes" include Internet viruses that carry on "intelligent" dialogs with a human victim in order to trick the human into dropping his or her malware guard. Moreover, phenomena similar to Turing tests occur in the context of computer games such as chess-playing programs. Although these programs select moves merely by applying brute-force techniques, humans competing against the computer often experience the sensation that the machine possesses creativity and even a personality. Similar sensations occur in robotics where machines have been built with physical attributes that project intelligent characteristics. Examples include toy robot dogs that project adorable personalities merely by tilting their heads or lifting their ears in response to a sound.

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Module 174

113. Artificial Intelligence: Understanding Images

Let us consider the problems posed by the puzzle-solving machine introduced in the module number 171. The opening and closing of the gripper on the machine present no serious obstacle, and the ability to detect the presence of the puzzle in the gripper during this process is straightforward because our application requires very little precision. Even the problem of focusing the camera on the puzzle can be handled simply by designing the gripper to position the puzzle at a particular predetermined position for viewing. Consequently, the first intelligent behavior required by the machine is the extraction of information through a visual medium.

It is important to realize that the problem faced by our machine when looking at the puzzle is not that of merely producing and storing an image. Technology has been able to do this for years as in the case of traditional photography and television systems. Instead, the problem is to understand the image in order to extract the cur- rent status of the puzzle (and perhaps later to monitor the movement of the tiles). In the case of our puzzle-solving machine, the possible interpretations of the puzzle image are relatively limited. We can assume that what appears is always an image containing the digits 1 through 8 in a well-organized pattern. The problem is merely to extract the arrangement of these digits. For this, we imagine that the picture of the puzzle has been encoded in terms of bits in the computer's memory, with each bit representing the brightness level of a particular pixel. Assuming a uniform size of the image (the machine holds the puzzle at a predetermined location in front of the camera), our machine can detect which tile is in which position by comparing the different sections of the picture to prerecorded templates consisting of the bit patterns produced by the individual digits used in the puzzle. As matches are found, the condition of the puzzle is revealed.

This technique of recognizing images is one method used in optical character readers. It has the drawback, however, of requiring a certain degree of uniformity for the style, size, and orientation of the symbols being read. In particular, the bit pattern produced by a physically large character does not match the template for a smaller version of the same symbol, even though the shapes are the same. Moreover, you can imagine how the problems increase in difficulty when trying to process handwritten material.

Another approach to the problem of character recognition is based on matching the geometric characteristics rather than the exact appearance of the symbols. In such cases the digit 1 might be characterized as a single vertical line, 2 might be an opened curved line joined with a horizontal straight line across the bottom, and so on. This method of recognizing symbols involves two steps: The first is to extract the features from the image being processed, and the second is to compare the features to those of known symbols. As with the template-matching approach, this technique for recognizing characters is not foolproof. For instance, minor errors in the image can produce a set of entirely different geometric features, as in the case of distinguishing between an O and a C or, in the case of the eight-puzzle, a 3 and an 8. We are fortunate in our puzzle application because we do not need to under- stand images of general three-dimensional scenes. Consider, for example, the advantage we have by being assured that the shapes to be recognized (the digits 1 through 8) are isolated in different parts of the picture rather than appearing as overlapping images, as is common in more general settings. In a general photograph, for instance, one is faced not only with the problem of recognizing an object from different angles but also with the fact that some portions of the object might be hidden from view.

The task of understanding general images is usually approached as a two-step process: (1) **image processing,** which refers to identifying characteristics of the image, and (2) **image analysis,** which refers to the process of understanding what these characteristics mean. We have already observed this dichotomy in the context of recognizing symbols by means of their geometric features. In that situation, we found image processing represented by the process of identifying the geometric features found in the image and image analysis represented by the process of identifying the meaning of those features.

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Image processing entails numerous topics. One is edge enhancement, which is the process of applying mathematical techniques to clarify the boundaries between regions in an image. In a sense, edge enhancement is an attempt to convert a photograph into a line drawing. Another activity in image analysis is known as region finding. This is the process of identifying those areas in an image that have common properties such as brightness, color, or texture. Such a region probably represents a section of the image that belongs to a single object. (It is the ability to recognize regions that allows computers to add color to old-fashioned black-and- white motion pictures.) Still another activity within the scope of image processing is smoothing, which is the process of removing flaws in the image. Smoothing keeps errors in the image from confusing the other image-processing steps, but too much smoothing can cause the loss of important information as well.

Smoothing, edge enhancement, and region finding are all steps toward identifying the various components in an image. Image analysis is the process of determining what these components represent and ultimately what the image means. Here one faces such problems as recognizing partially obstructed objects from different perspectives. One approach to image analysis is to start with an assumption about what the image might be and then try to associate the components in the image with the objects whose presence is conjectured. This appears to be an approach applied by humans. For instance, we sometimes find it hard to recognize an unexpected object in a setting in which our vision is blurred, but once we have a clue to what the object might be, we can easily identify it.

The problems associated with general image analysis are enormous, and much research in the area remains to be done. Indeed, image analysis is one of the fields that demonstrates how tasks that are performed quickly and apparently easily by the human mind continue to challenge the capabilities of machines.

Module 175

114. Artificial Intelligence: Language Processing

Another perception problem that has proven challenging is that of understanding language. The success obtained in translating formal high-level programming languages into machine language led early researchers to believe that the ability to program computers to understand natural language was only a few years away. Indeed, the ability to translate programs gives the illusion that the machine actually understands the language being translated.

What these researchers failed to understand was the depth to which formal programming languages differ from natural languages such as English, German, and Latin. Programming languages are constructed from well-designed primitives so that each statement has only one grammatical structure and only one meaning. In contrast, a statement in a natural language can have multiple meanings depending on its context or even the manner in which it is communicated. Thus, to understand natural language, humans rely heavily on additional knowledge.

For example, the sentences

Norman Rockwell painted people.

and

Cinderella had a ball.

have multiple meanings that cannot be distinguished by parsing or translating each word independently. Instead, to understand these sentences requires the ability to comprehend the context in which the statement is made. In other instances, the true meaning of a sentence is not the same as its literal translation. For example,

Do you know what time it is?

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Often means "Please tell me what time it is," or if the speaker has been waiting for a long time, it might mean "You are very late."

To unravel the meaning of a statement in a natural language therefore requires several levels of analysis. The first of these is **syntactic analysis,** whose major component is parsing. It is here that the subject of the sentence

Mary gave John a birthday card. is recognized as *Mary*, while the subject of

John got a birthday card from Mary.

is found to be *John.*

Another level of analysis is called **semantic analysis.** In contrast to the parsing process, which merely identifies the grammatical role of each word, semantic analysis is charged with the task of identifying the semantic role of each word in the statement. Semantic analysis seeks to identify such things as the action described, the agent of that action (which might or might not be the subject of the sentence), and the object of the action. It is through semantic analysis that the sentences "Mary gave John a birthday card" and "John got a birthday card from Mary" would be recognized as saying the same thing.

A third level of analysis is **contextual analysis.** It is at this level that the context of the sentence is brought into the understanding process. For example, it is easy to identify the grammatical role of each word in the sentence:

The bat fell to the ground.

We can even perform semantic analysis by identifying the action involved as *falling*, the agent as *bat*, and so on. But it is not until we consider the context of the statement that the meaning of the statement becomes clear. In particular, it has a different meaning in the context of a baseball game than it does in the context of cave exploration. Moreover, it is at the contextual level that the true meaning of the question "Do you know what time it is?" would finally be revealed.

We should note that the various levels of analysis—syntactic, semantic, and contextual—are not necessarily independent. The subject of the sentence

Stampeding cattle can be dangerous.

is the noun *cattle* (modified by the adjective *stampeding*) if we envision the cattle stampeding on their own. But the subject is the gerund *stampeding* (with object *cattle*) in the context of a troublemaker whose entertainment consists of starting stampedes. Thus the sentence has more than one grammatical structure—which one is correct depends on the context.

Another area of research in natural language processing concerns an entire document rather than individual sentences. Here the problems of concern fall into two categories: **information retrieval** and **information extraction.** Information retrieval refers to the task of identifying documents that relate to the topic at hand. An example is the problem faced by users of the World Wide Web as they try to find the sites that relate to a particular topic. The current state of the art is to search sites for key words, but this often produces an avalanche of false leads and can overlook an important site because it deals with "automobiles" instead of "cars." What is needed is a search mechanism that understands the contents of the sites being considered. The difficulty of obtaining such under- standing is the reason many are turning to techniques such as XML to produce a semantic Web as was introduced in the module 75.

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Module 176

115. CS Impact: CS impact on Society

Computer Science has impacted lives of humans largely. In this module we will learn the positive and negative impacts of CS on our society.

Positive impact of CS:

- ✓ It has improved the communication between people.
- ✓ Increased access to educational information via the Internet
- ✓ Increased productivity of people as now their manual work has reduced significantly.
- ✓ Exponential business growth
- ✓ Faster response times (for example, email, instant messaging and chat)

Negative Impact:

- ✓ People are working in sitting position and thus have more chance to develop obesity.
- ✓ Exposure to inappropriate material via the Internet
- ✓ Increased crime and access to private information
- ✓ Hacking bank account and transfer money to your account
- ✓ People are now over-dependent on technology. They even try to catch the people online even if the person is sitting near them geographically. This has decreased the social interactions as well.

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Module 177

116. CS Impact: CS Impact on Health

Computer Science has both positive and negative impacts on health.

Positive impact

- ✓ Easy access to online health centers
- ✓ We can take online appointment
- ✓ We can receive reports via email at home
- ✓ Hospitals can be managed more efficiently
- ✓ Online health tips/issues are available.
- ✓ Health news can be viewed online.

Negative impact

- ✓ Computer wrists – Typing too much. This creates issues in the hands.
- ✓ Eyesight – eye is not meant to look 2D for long amount of time. This increases the risk of eye diseases.
- ✓ Hearing loss is more common in those listening to high volume music on computer.
- ✓ Social Isolation
- ✓ Communication Issues
- ✓ Posture could lead bone issues
- ✓ Radiation Damage when the device is running. Its better to put off all such digital devices especially mobile phones or if it's really necessary to use mobile phone as alarm, then turn on the "airplane mode" in your phones.

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Module 178

117. CS Impact: CS Impact on Environment

Computer Science has both positive and negative impacts on the environment as well.

Positive impact

- ✓ Paperless – Online reading and publishing.
- ✓ Americans use about 680 pounds of paper per person, per year
- ✓ This amounts to about 85 million tons of paper or 2 billion trees.
- ✓ The average American household throws away 13,000 pieces of paper (around 1 billion trees in total in USA) each year. Most in the form of packaging and junk mail.
- ✓ Due to the usage of computer, the above waste of trees is minimizing in the world.

Negative impact

- ✓ In offices, people print unnecessarily.
- ✓ Computers are made from heavy metals (Lead, mercury, Beryllium, Cadmium, PCV) when thrown-away cause water contamination and air pollution.
- ✓ E-waste is sent to developing countries where people extract materials from these electronics such as gold, silver, and copper.
- ✓ They extract them by burning the substances and that process releases hazardous smoke into the air.
- ✓ The people present around the e-waste gain diseases such as skin cancer, brain damage, lung cancer, kidney disease
- ✓ Usage of energy has also increased with the use of computer.

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Module 179

118. CS Impact: Ethical Issues

Ethical issues are related to moral principles or the branch of knowledge dealing with these. Questions of ethics and legality are essential in many industries. Doctors, teachers, government officials and businesspeople all have legal and ethical oversight to control how their professions function. Information technology, by contrast, has no overarching standardization in place. However, as information technology becomes increasingly influential, the ethical and legal considerations become similarly relevant. Here are the five most pressing ethical and legal issues confronting the industry today.

Privacy

Most people have their personal data spread throughout the digital world. Even things thought to be secure, such as email or private accounts, can be accessed by unintended sources. Most employers actively check their employees' computer habits. Privacy has evolving legal implications, but there are also ethical considerations. Do people know how their accounts are monitored? To what extent is such monitoring occurring? Privacy concerns can easily become a slippery slope, slowly eroding an individual's right to privacy completely.

Digital Ownership

Digital mediums have allowed information to flow more freely than before. This exchange of ideas comes with a legal and ethical backlash. How can ownership be established in the digital realm? Things can be easily copied and pasted online, which makes intellectual property hard to control. Legal notions such as copyright have struggled to keep up with the digital era. Companies in the music and entertainment industries have pushed for greater legal protections for intellectual properties while other activists have sought to provide greater freedoms for the exchange of ideas in the digital realm.

Data Gathering

On some level, everyone knows that their online lives are monitored. The United States has even passed legislation allowing the government to actively monitor private citizens in the name of national security. These measures have revived a debate about what information can be gathered and why. This debate applies on a smaller scale as well because companies need to consider what information to collect from their employees. This issue invokes a question of consent. Do people know what information is being monitored? Do they have a right to know how their data is being used?

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Module 180

119. CS Impact: Software Licenses and Information Privacy

Software licenses typically provide end users with the right to one or more copies of the software without violating copyrights. The license also defines the responsibilities of the parties entering into the license agreement and may impose restrictions on how the software can be used. Software licensing terms and conditions usually include fair use of the software, the limitations of liability, warranties and disclaimers and protections if the software or its use infringes on the intellectual property rights of others.

Software licenses typically are either proprietary, free or open source, the distinguishing feature being the terms under which users may redistribute or copy the software for future development or use.

Information Privacy

Data privacy, also called information privacy deals with the ability an organization or individual has to determine what data in a computer system can be shared with third parties.

Children's Online Privacy Protection Act

(COPPA) - gives parents control over what information websites can collect from their kids.

Health Insurance Portability and Accountability Act

(HIPPA) - ensures patient confidentiality for all healthcare-related data.

Electronic Communications Privacy Act

ECPA extends government restrictions on wire taps to include transmissions of electronic data.

Video Privacy Protection Act

Prevents wrongful disclosure of an individual's personally identifiable information stemming from their rental or purchase of audiovisual material.

Gramm-Leach-Bliley Act

Mandates how financial institutions must deal with the private information of individuals.

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Module 181

120. CS Impact: Intellectual Property

Intellectual property (IP) is ideas, information and knowledge. In the University context IP can be viewed as the results and outcomes of research – 'intellectual' because it is creative output and 'property' because it is viewed as a tradable commodity. Intellectual property rights (IPR) are specific legal rights which protect the owners of IP. IPR can be subdivided into the major categories below.

Patent

A patent is a legal monopoly lasting 20 years granted in exchange for describing an invention and paying fees to the Patent Office. A patent position is destroyed by public disclosure of the idea before a patent application is filed (except for a short grace period in the US). Think patent before you publish.

Copyright

Copyright applies to literary and dramatic works, artistic and musical works, audio and video recordings, broadcasts and cable transmissions. Copyright is also the usual way of protecting software, although some software may be patented if it is a functional part of an invention. Copyright arises automatically – it does not need to be applied for – and lasts 70 years after the death of the author.

Database right

Database rights apply to databases which are not protected by copyright (an EU right only – maximum duration is 15 years).

Design right

Design right applies to aspects of the shape or configuration of an article. Unregistered design right (which covers computer chips, for example) can protect internal or external features. In the case of registered designs, the features must appeal to and be judged by the eye. (Registered design rights are protected for a maximum of 25 years.)

Trademark

A trademark is a mark (logo) or other distinctive sign applied to or associated with products or services, which does not describe the products or services. (Once registered the trademark IPR is unlimited.)

Confidential information

Confidential information is knowledge which only you possess and which you have only revealed under a non-disclosure/confidentiality agreement. The comprehensive table has been shown to highlight the details of all the above intellectual properties.

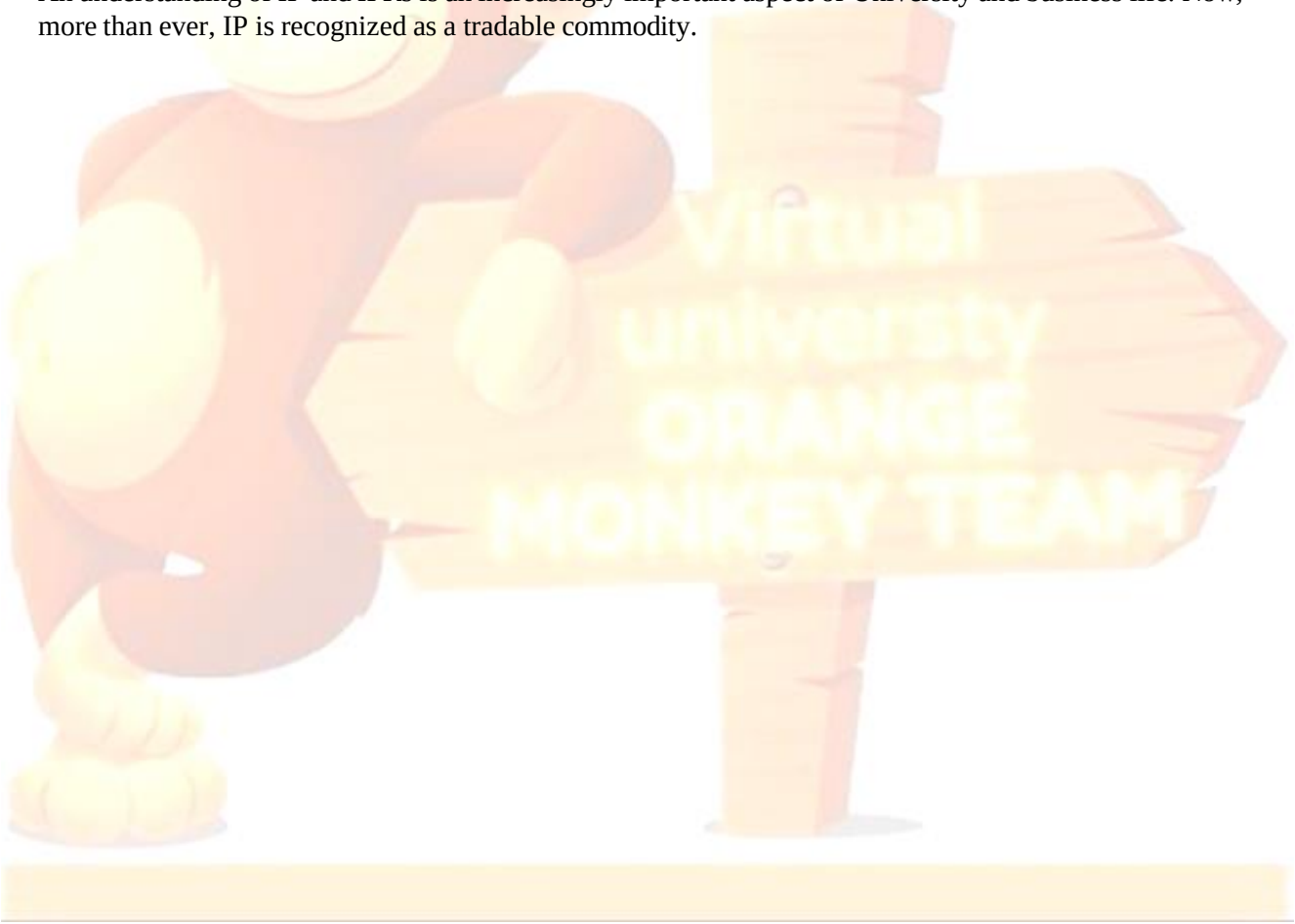
IPR	Covers	Need to apply?	Maximum duration
Patent	Inventions	Yes	20 years
Copyright	Literary, musical, artistic works, and software	No	70 years after death of author

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Registered design	Image – look and feel	Yes	25 years
Registered trademark	Name, logo	Yes	Unlimited
Confidential information	Unpublished secret information	No	Unlimited
Database right	Databases	No	15 years

Successful management of IPR provides the means by which individuals and institutions are able to protect their creative output from imitators.

An understanding of IP and IPRs is an increasingly important aspect of University and business life. Now, more than ever, IP is recognized as a tradable commodity.



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Module 182

121. CS Impact: Security

Computer security, also known as **cyber-security** or **IT security**, is the protection of information systems from theft or damage to the hardware, the software, and to the information on them, as well as from disruption or misdirection of the services they provide. It includes controlling physical access to the hardware, as well as protecting against harm that may come via network access, data and code injection, and due to malpractice by operators, whether intentional, accidental, or due to them being tricked into deviating from secure procedures.

What are the concerns of computer security?

Computer Security is concerned with four main areas:

1. Confidentiality:- Only authorized users can access the data resources and information.

2. Integrity:- Only authorized users should be able to modify the data when needed.

3. Availability:- Data should be available to users when needed.

4. Authentication:- are you really communicating with whom you think you are communicating with

Why is computer security important?

Prevention of data theft such as bank account numbers, credit card information, passwords, work related documents or sheets, etc. is essential in today's communications since many of our day to day actions depend on the security of the data paths.
Data present in a computer can also be misused by unauthorized intrusions. An intruder can modify and change the program source codes and can also use your pictures or email accounts to create derogatory content such as pornographic images, fake misleading and offensive social accounts.

Malicious intents can also be a factor in computer security. Intruders often use your computers for attacking other computers or websites or networks for creating havoc. Vengeful hackers might crash someone's computer system to create data loss. DDOS attacks can be made to prevent access to websites by crashing the server.
Above factors imply that your data should remain safe and confidential. Therefore, it is necessary to protect your computer and hence the need for Computer Security arises.

What is firewall?

A firewall is a security-conscious piece of hardware or soft-ware that sits between the Internet and your network with a single-minded task: preventing them from getting to us. The firewall acts as a security guard between the Internet and your local area network (LAN). All network traffic into and out of the LAN must pass through the firewall, which prevents unauthorized access to the network.

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Module 183

122. CS Impact: Privacy

Individual's right to own the data generated by his or her life and activities, and to restrict the outward flow of that data. Privacy uses the theory of natural rights, and generally responds to new information and communication technologies. In North America, Samuel D. Warren and Louis D. Brandeis wrote that privacy is the "right to be let alone".

From where data comes from:

- ✓ Social Sites (Facebook, twitter)
- ✓ Telephone companies (mobile networks)
- ✓ Smart city cameras on road
- ✓ Emails
- ✓ Personal Software
- ✓ Passwords, logins etc

How to handle on internet

- ✓ Emails can be encrypted
- ✓ Anonymizing proxies
- ✓ Anonymizing networks

Privacy Information

Privacy information of famous websites is given below:

- ✓ Google: https://policies.google.com/privacy
- ✓ msn: https://www.msn.com/en-us/autos/partner/privacypolicy
- ✓ WhatsApp: https://www.whatsapp.com/legal/#privacy-policy

EPIC

- ✓ Electronic Privacy Information Center
- ✓ Independent non-profit research center in Wasgingon D.C. Its mission is to focus public attention on emerging Privacy and related human rights issues.
- ✓ EPIC has pursued several successful consumer privacy complaints with the US Federal Trade Commission, concerning Snapchat (faulty privacy Technology), WhatsAp (privacy policy after acquisition by Facebook (changes in user privacy settings), Google (roll-out of GoogleBuzz), Microsoft (Hailstorm log-in),issues.

PI

- ✓ Privacy International

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- ✓ Charity organization of London, UK

Priority Areas:

- ✓ Challenging Data Exploitation
- ✓ Building the Global Privacy Movement
- ✓ Contesting Surveillance

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Module 184

123. CS Impact: Social Issues of IT

The growth in the availability of affordable computing technology has caused a number of major shifts in the way that society operates. The majority of these have been for the better, with home computers and the internet providing unlimited access to all of the information ever created and discovered by humanity.

There are, however, some less positive social issues generated as a direct result of technological advances. In the interests of balance, it is important to analyze these and assess the severity of their impact so that steps can be taken to better understand and combat the negative effects.

1. Communication Breakdown

Socializing within a family unit has always been important, as it strengthens the bonds between us and ensures cohesion within the group. But with more and more households owning several computers and numerous portable devices granting access to information and entertainment, some argue that this is leading to a lack of family communication.

2. Defamation of Character

The only means of getting in touch with major corporations or famous people in the public eye prior to the advent of digital communication was via a stiffly written letter. This was, of course, accessible only to the intended recipient and thus a very private way for the disgruntled to vent their spleen. But first message boards and now social media services like Facebook and Twitter are being used to defame people and businesses in an intrinsically public manner.

3. Identity Theft

Fraud is another spurious activity that has been able to evolve in the wake of easily accessible computers and the internet. Perhaps most problematic and prevalent of the various fraudulent activities is identity theft, in which personal details of innocent people are harvested by a third party so that they can be used for malicious purposes. This includes carrying out illicit online transactions and other damaging activities that can have serious ramifications.

4. Cyber Bullying

As with the defamation of public figures, the internet and computers have also made it easier for spiteful people to attack people they know personally as well as perfect strangers via the anonymous platforms that are available to them.

5. Gaming Addiction

Whilst computers and the internet have made it easier for gambling addicts to get their fix, a new type of addiction has also arisen, in the form of addiction to videogames. This is something that can impact people of all ages and leads inevitably to a number of problems, from the social to the financial.

6. Privacy

Whilst high profile cases of online identity theft and fraud should have caused people to become more careful about how they use their personal information, issues of privacy and a lack of appreciation for the

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risks are still widespread. This extends beyond simply giving away private data via chat rooms, message boards and e-commerce sites and extends into the compromising world of social media.

7. Health & Fitness

We are living increasingly sedentary lifestyles, because computers are removing the need for us to physically carry out many tasks, as well as keeping us rooted to one spot throughout our working days and during our leisure time.

8. Education

The educational properties of computers are well known and universally lauded but having all the information in existence on tap has its own issues. In particular, the practice of plagiarism has become a major problem, as students can simply copy and paste whole chunks of text from online sources without attributing the work to anyone else. This has become the bane of educational institutions, which tend to come down hard on detected plagiarists in order to discourage similar activities from others.

9. Terrorism & Crime

Computers have been a positive force in allowing for the creation of global movements and righteous activism in a number of forms. However, the other side of the coin is that terrorists and organized criminals also exploit the web for their own nefarious purposes.

10. Access to forbidden literature

Computer has made available the access to the forbidden literature. This has led us to many social problems in the society.

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Module 185

124. CS Impact: Content Filtering, Email-Spams and Laws

Content filtering, in the most general sense, involves using a program to prevent access to certain items, which may be harmful if opened or accessed. The most common items to filter are executable, emails or websites.

How it works

Content filtering works by matching strings of characters. When the strings match, the content is not allowed through. Content filters are often part of Internet firewalls. In such a usage content filtering is serving a security purpose. Content filtering is also used to implement company policies related to information system usage. For example, it's common to filter websites like Facebook, youtube etc which are considered unrelated to work.

Spam emails

As email spam continues to become a major issue, governments around the world have put specific regulations in place to protect their citizens from spams.

Important Laws

- ✓ CAN-SPAM Act in US
- ✓ Canada's Anti-Spam Legislation (CASL)
- ✓ Anti-spam law in Europe
- ✓ Spam Act of 2003 in Australia
- ✓ Africa, Asia and South America have looser spam-law requirements

CAN-SPAM Act

1. Don't use false or misleading header information
2. Don't use deceptive subject lines
3. Identify the message as an ad
4. Tell recipients where you're located
5. Honor opt-out requests promptly
6. Monitor what others are doing on your behalf

Major requirements

- ✓ Ask for permission before adding emails
- ✓ User could identify you as Sender
- ✓ Do not give email address to others
- ✓ Be honest

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Module 186

125. CS Impact: Children Protection and Electronic Theft

There are lots of reasons why people start using parental controls. Perhaps to stop late night phone checking. Perhaps to help stop arguments when it's time put the iPad down and get on with homework. Maybe to reduce the total amount of time being spent on screens in general. There are many more cases. Ultimately though all of these reasons amount to a desire for one's children to become more responsible and disciplined in their use of digital technology.

We hope and aim to encourage an attitude and approach in our kids that will render parental controls unnecessary. But how can we make sure that our use of parental controls doesn't wind up as abstract punishment or authoritarian control but is a genuine tool for building responsibility and right priorities in our kids? One method that's got quite a bit of attention on social media is the idea of a parent/child cell phone contract.

The following risks are involved in such scenarios:

- ✓ Content Risks.
- ✓ Contact Risks
- ✓ Online Marketing
- ✓ Overspending
- ✓ Electronic Theft
- ✓ Information Privacy
- ✓ Information Security

Content Risks

- ✓ Illegal Content
- ✓ Harmful Content
- ✓ Harmful Advice

Contact Risks

- ✓ Online Harassment
- ✓ Cyberbullying
- ✓ Illegal interactions
- ✓ Problematic content sharing

Online Marketing

- ✓ Inappropriate or unsuitable products
- ✓ Illegal and Age-restricted products

Electronic Theft

- ✓ Online Fraud
- ✓ Online scam
- ✓ Identify theft

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Information Privacy

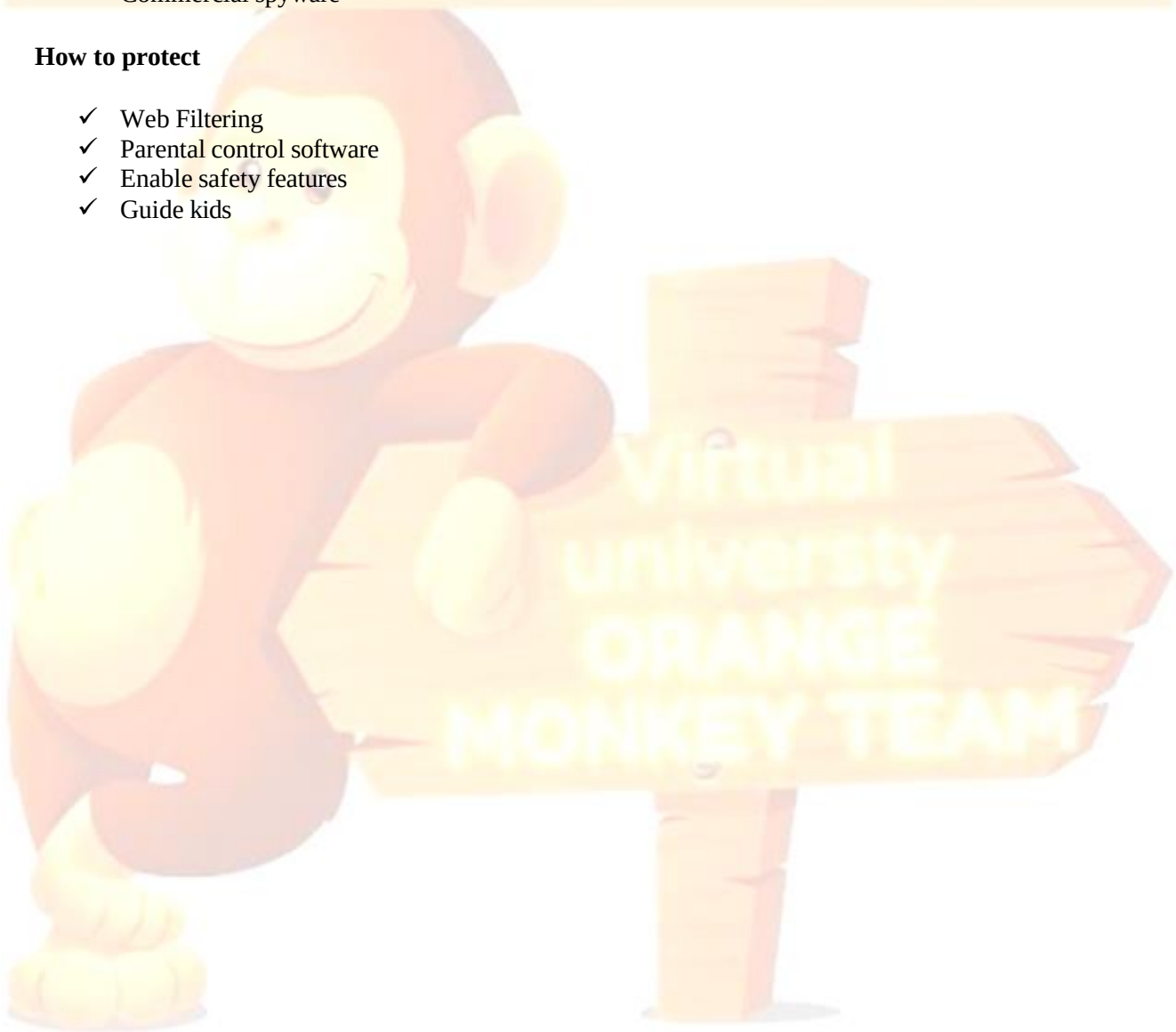
- ✓ Personal data collection from children

Information Security

- ✓ Malicious code
- ✓ Commercial spyware

How to protect

- ✓ Web Filtering
- ✓ Parental control software
- ✓ Enable safety features
- ✓ Guide kids



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Module 187

126. Word Processing: MS Word

One of the most important application software are the word processors. These software help individuals and companies to prepare digital documents in a proper format. One of the famous word processing software is MS Word, which is included in the Microsoft Office.

Figure 130 is the screen short for windows XP to open MS Word 2007.

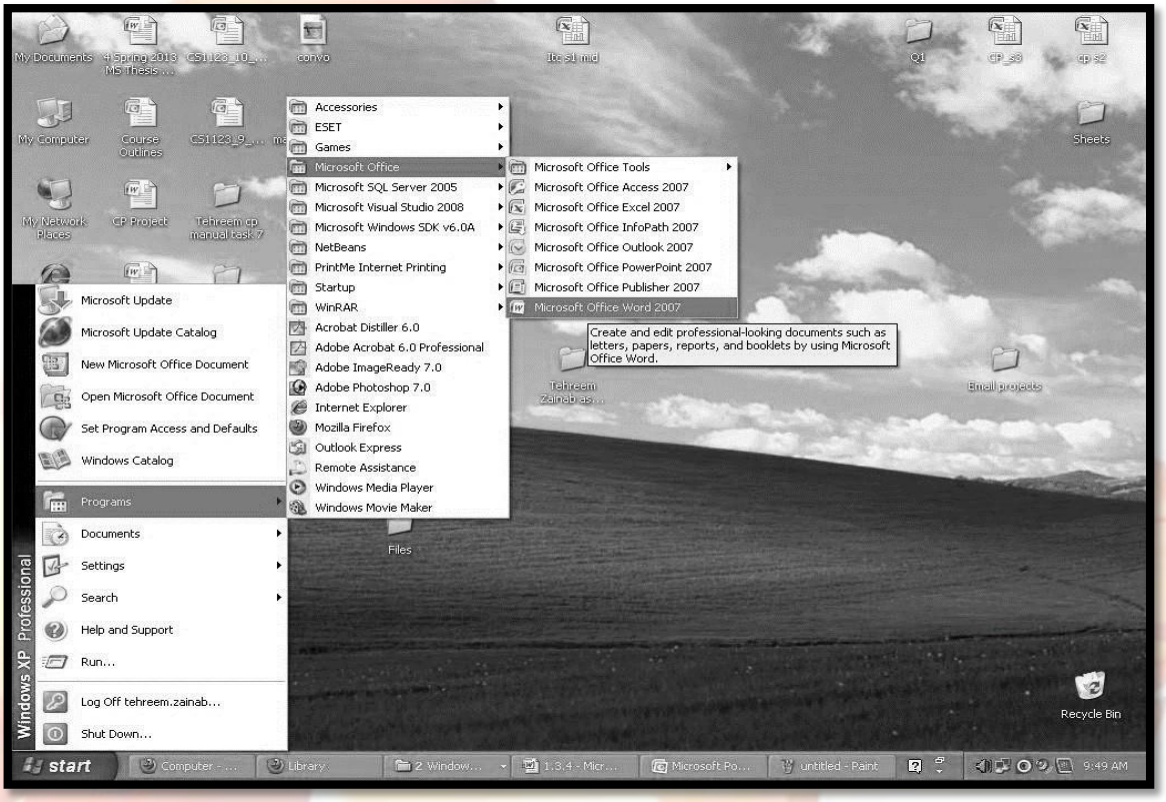


Figure 130: Start Menu to launch MS Word

The Office Button

Figure 130 shows the MS word home ribbon.



Figure 131: MS Word Home ribbon

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The colorful icon in the top left-hand corner of the **Word** window (Figure 131) is the **Office button.** When you point to the Office button with the mouse pointer it will turn orange**.** When you click the left mouse button while pointing to the Office button, a menu will open that contains some of the most commonly used commands which used to be found in the **File** drop-down menu in earlier versions of **Word**. **Recent documents** are listed in the **Recent Documents** pane on the right side of the menu as shown in Figure 132.

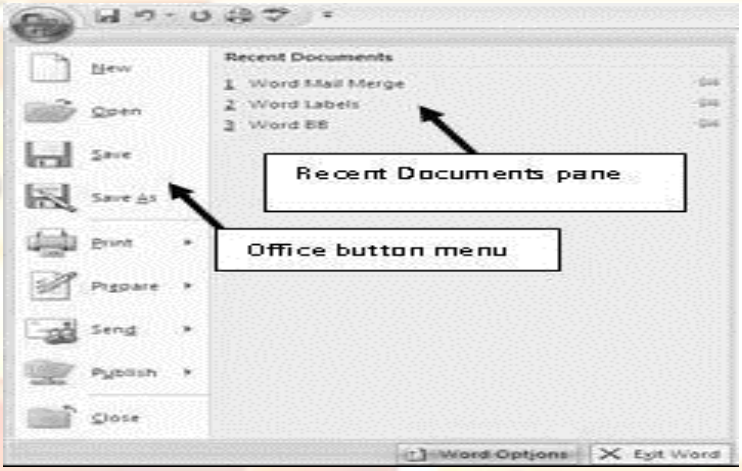


Figure 132: MS Word home ribbon after click

The ribbon is divided into Tabs, Groups, and Commands.

Each tab opens a different ribbon with groups of commands inside it. Microsoft has tried to make the placement of the commands within both groups and tabs as intuitive as possible to make them easy to find. By using the Ribbon system, the user has many less mouse clicks to execute the desired command.

The items on the ribbons are grouped together by common task. The main ribbon is the Home Tab/ribbon. The home tab/ribbon in Excel and PowerPoint are similar. Below is the image of MS Word Home Ribbon.

Below is the explanation of different components in the home ribbon of MS Word 2007.


In the lower right-hand corner of some groups is a small down pointing arrow. These are referred to as **Dialog Expanders** or **Launchers**. Clicking on the arrow will open a **Dialog window** or a **Command pane**. The dialog box may provide additional options that may not be contained on the active tab. Most of the dialog boxes that appear should be familiar; many are taken directly from earlier versions of the program.

The Ribbon has three types of Commands:

- Simple Buttons
- Drop-down menus Buttons
- Launchers (or Dialog Expanders) Buttons

Simple Buttons work as **Toggles** or **on/off switches**. When the command is off it will be surrounded by blue and look like all other commands as shown in the Figure 133. When a command button is on, it will be surrounded by orange. A command will only work when it is on. **Bold** is an example of a button as shown in Figure 133.

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Figure 133: Font Panel

If you aren't sure what a command is or what a command does, place the mouse pointer over the command and hold it there. A text box will open up. The text box contains the command name, the keyboard shortcuts for the command, along with an explanation of the command as shown in the Figure 134.

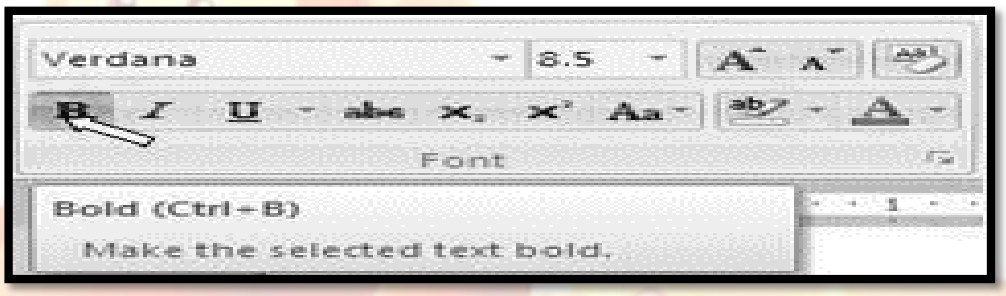


Figure 134: Bold Clicked in Font Panel

Drop-down menu buttons will have a down arrow to the right of the command. Just like buttons, the drop-down menu command will be surrounded by orange and the drop-down list will open up. **Change case** control is an example of a drop-down menu as shown in the Figure 135.

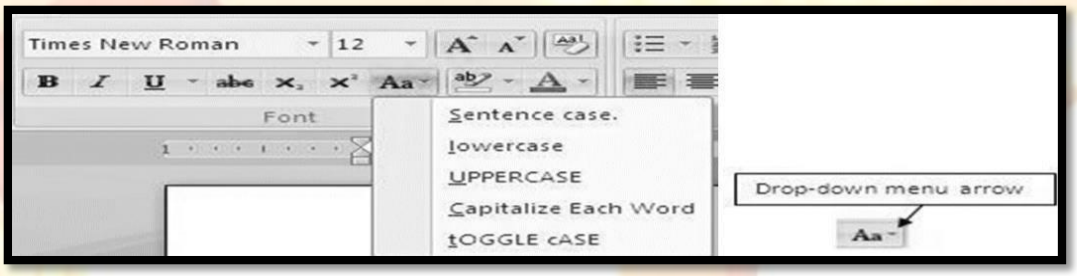


Figure 135: Font Panel Changing Case

Some commands are a combination of a **simple button** and a **drop-down menu button**. There are two buttons for these commands. The left button is a simple button and the right buttons is drop-down menu arrow button. If one clicks on the simple button the default value will be used, if one click on the drop-down menu arrow there will be a number of options available from which to choose. The default value is the last used value for the command. **Underline** is an example of a combination command as shown in the Figure 136.

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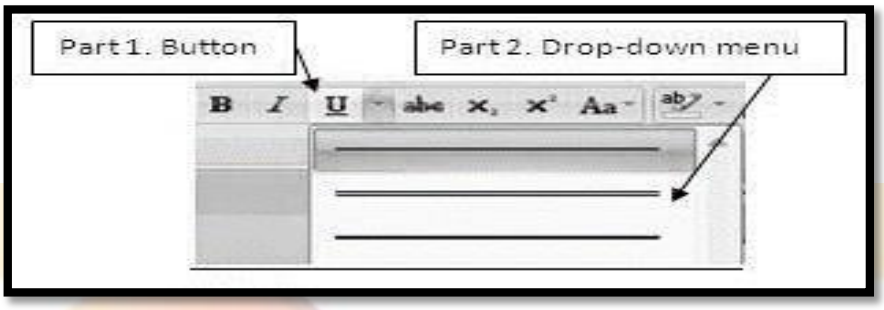


Figure 136: Underline Panel

Launcher (or Dialog Expanders) buttons

Launcher (or Dialog Expanders) buttons as shown in figure 8are usually displayed in the bottom right corner of some groups. Clicking the launcher button will open up a series of options either in a Task pane (such as the Clipboard) or a Dialog window such as the Font group.



Figure 137: Panel Launch Buttons

Mini Tool Bar

The Mini Toolbar appears automatically whenever you select text and contains common text formatting commands as shown in the Figure 138. To Use the Mini Toolbar: Select the text you want to format and click the desired command on the Mini Toolbar. Click anywhere outside the Mini Toolbar to close it.

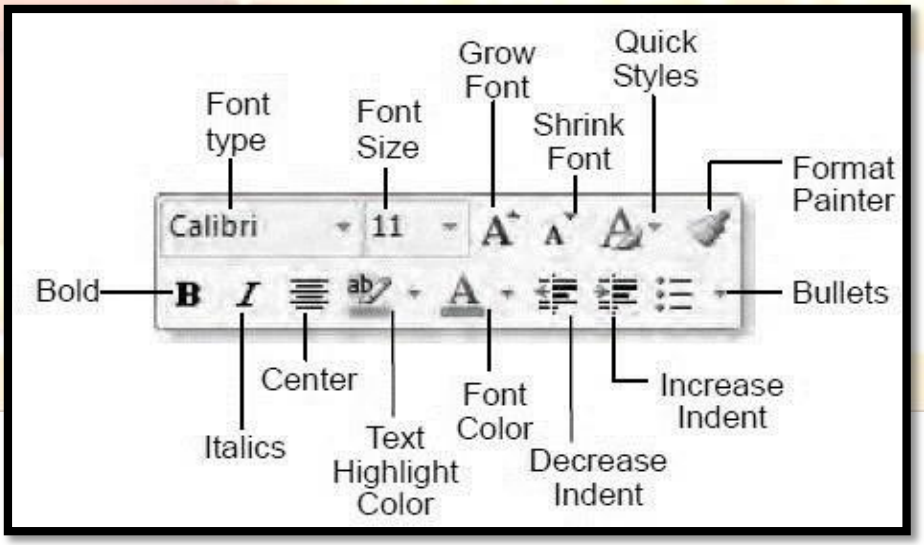


Figure 138: Mini Toolbar

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Module 188

127. Word Processing: MS Word (Quick Access bar)

The Quick Access Toolbar (Figure 139) provides easy access to the commands you use most frequently. The Save, Undo, Redo/Repeat, and Quick Print buttons appear on the Quick Access Toolbar by default, but you can add and remove commands to meet your needs. You can quickly reverse most commands you execute by using Undo. If you then change your mind again, and want to reapply a command, you can use Redo as shown in the Figure 139.

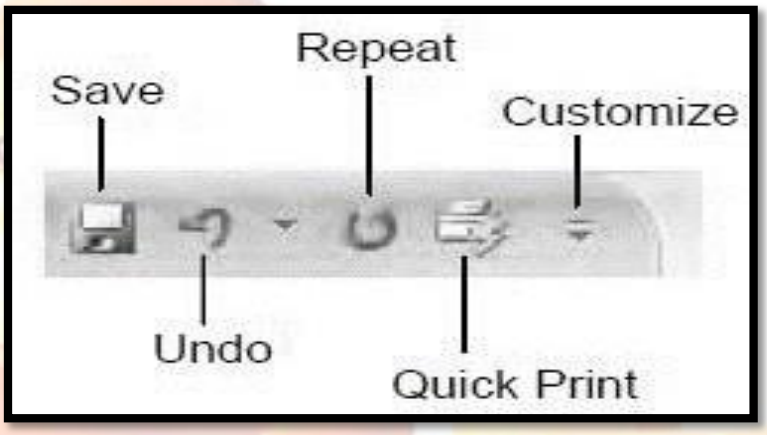


Figure 139: Quick Access toolbar

Exercise

1. Type word “Undo example”.
2. Click the Undo button on the Quick Access menu. The typing disappears.
3. Click the Redo button on the Quick Access menu. The typing reappears.
4. Select "Undo example."
5. Press Ctrl+b to bold. Word bolds the text.
6. Press Ctrl+i. Word italicizes the text.
7. Press Ctrl+u Word underlines the text.
8. Click the down arrow next to the Undo icon. You will see the actions youperformed listed. To undo the underline, click Underline; to undo the underline and italic, click Underline Italic; to undo the underline, italic, and bold click Bold etc.
9. To redo, click the Redo icon several times.

Alternate Method -- Undo & Redo by Using Keys

1. Type word “Undo example”.
2. Press Ctrl+z. The typing disappears.
3. Press Ctrl+y. The typing reappears.
4. Select "Undo example."
5. Press Ctrl+u to underline.
6. Press Ctrl+z. The underline is removed.
7. Press Ctrl+y. The underline reappears.

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Module 189

128. Word Processing: MS Word (Home Ribbon)

The home ribbon is one of the most important ribbon available in the MS Word. Figure 140 shows the home ribbon. It contains different important groups such as: Clipboard, Font, Paragraph, Styles and Editing. We will be learning each module of home ribbon in the next modules in details.

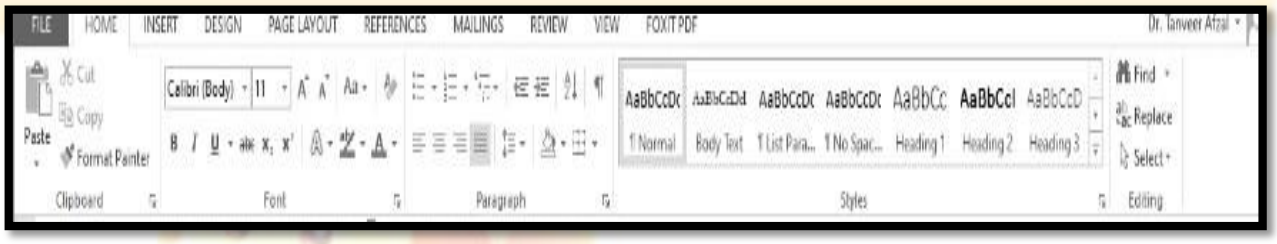


Figure 140: Home ribbon

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Module 190

129. Word Processing: MS Word (Clipboard Group)

The **Home** ribbon is made up of the most used commands in Word. The first group on the **Home** ribbon is the **Clipboard. Copy**, **Cut**, **Paste** and **Format Paste** are the commands within the Clipboard group as shown in the Figure 141. The Clipboard commands are on the Home ribbon of **Word** and all other Office 2007 applications that use the ribbon. The dialog expander arrow of the Clipboard group will open up the **Clipboard pane**, showing all items that can be pasted.



Figure 141: Clipboard Group

Cut and Paste

You can use Word's Cut feature to remove text from a document. You can use the Paste feature to place the information you cut anywhere in the same or another document. In other words, you can move information from one place in a document to another place in the same or different document by using the Cut and Paste features. The Office Clipboard is a storage area. When you cut, Word stores the data you cut on the Clipboard. You can paste the information that is stored on the Clipboard as often as you like.

Cut with the Ribbon

1. Type the following:
   I want to move. I am content where I am.
2. Select "I want to move."
3. Choose the Home tab.
4. Click the Cut button 

in the Clipboard group as shown in the Figure 142. Word cuts the text you selected and places it on the Clipboard. Your text should now read:
"I am content where I am."

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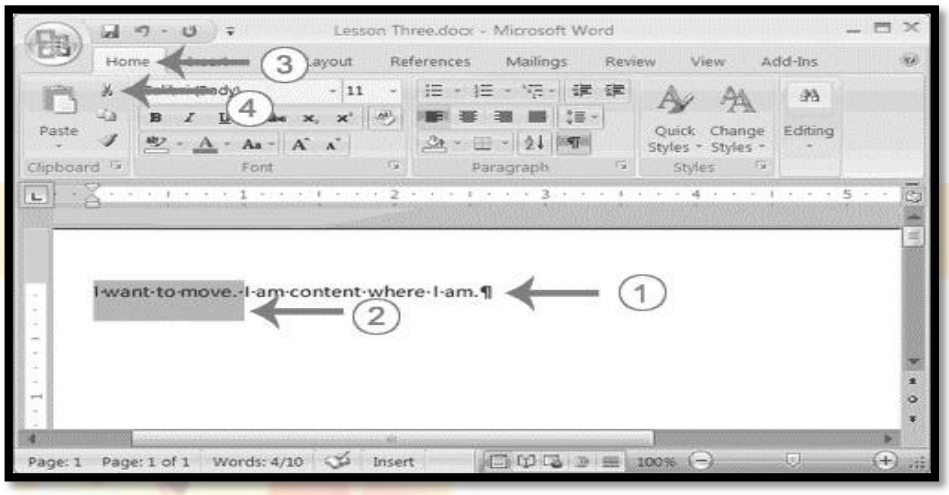


Figure 142: Cut option in clipboard group

Paste with the Ribbon

1. Place the cursor after the period in the sentence "I am content where I am."
2. Press the spacebar to leave a space.
3. Choose the Home tab.
4. Click the Paste button 

in the Clipboard group as shown in the Figure 143. Word pastes the text on the Clipboard. Your text should now read:

"I am content where I am. I want to move."

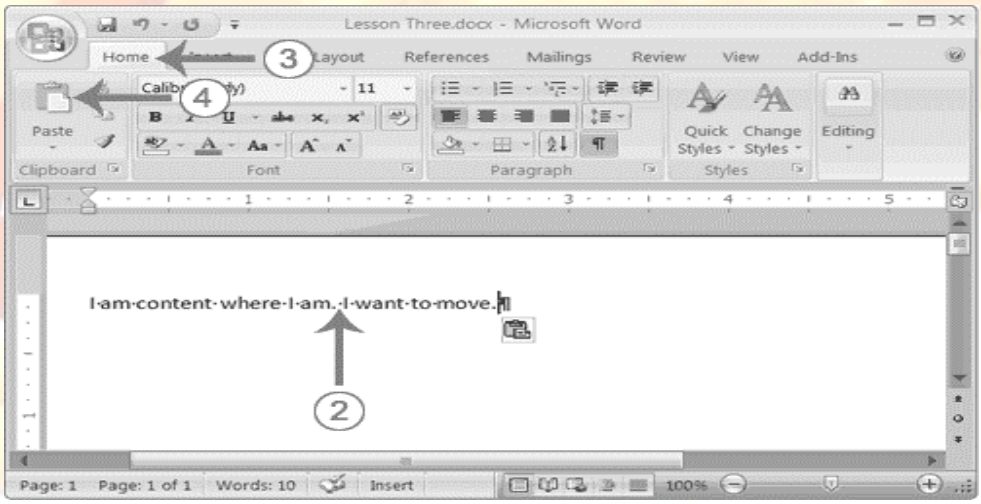


Figure 143: Pasting in Document

Alternate Method—Cut with a Context Menu

1. Type the following:
   I want to move. I am content where I am.
2. Select "I want to move."

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3. Right-click. The Mini toolbar and a context menu appear.
4. Click Cut on the menu as shown in the Figure 144. Your text should now read: "I am content where I am."

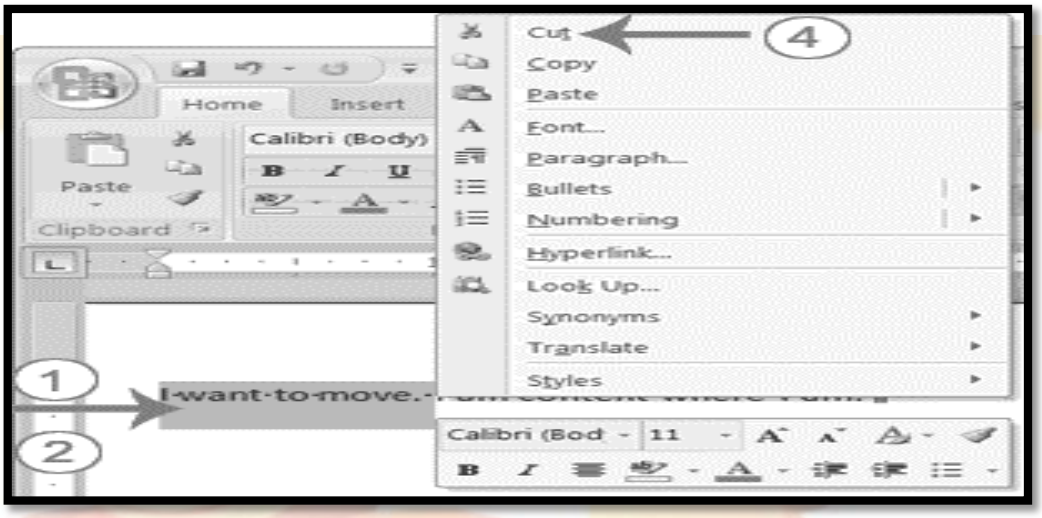


Figure 144: Pasting in Document (Alternate Method)

Alternate Method—Paste with a Context Menu

1. Place the cursor after the period in the sentence "I am content where I am."
2. Press the spacebar to leave a space.
3. Right-click. A Mini toolbar and a context menu appear as shown in the Figure 145.
4. Click Paste. Your text should now read:

"I am content where I am. I want to move."

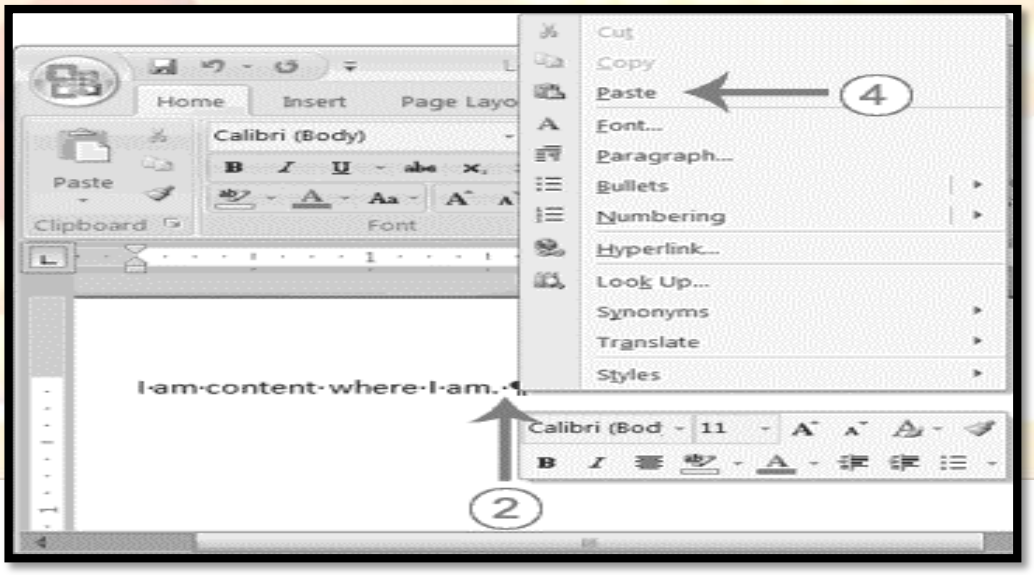


Figure 145: Pasting in Document (Alternate Method)

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Alternate Method—Cut with Keys

1. Type the following:

I want to move. I am content where I am.

2. Select "I want to move."
3. Press Ctrl+x.

Your text should now read: " I am content where I am."

Alternate Method—Paste with Keys

1. Place the cursor after the period in the sentence: "I am content where I am."
2. Press the spacebar to leave a space.
3. Press Ctrl+v.
4. Your text should now read:
   "I am content where I am. I want to move."

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Module 191

130. Word Processing: MS Word (Font Group)

The second group of commands on the Home ribbon is the Font group. The font group commands are format enhancing tool that includes font typefaces, font size, font effects (bold, italics, underline, etc.), colors and more. Remember that you can preview how the new font will look by highlighting the text, and hovering over the new font typeface as shown in the Figure 146. The expander arrow in the Font group will open up the Font dialog window.

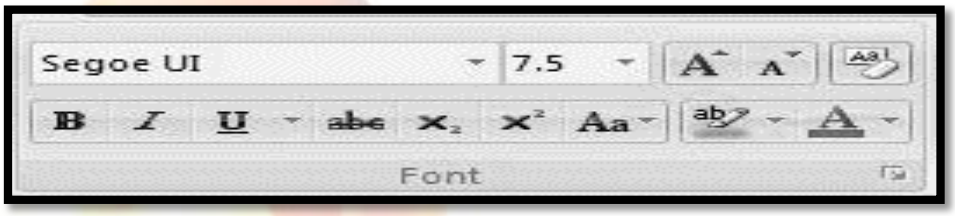


Figure 146: Font group

7.1.1 Basic Text Editing (Font Group Task)

Type your name in document window at insertion point as shown below in the Figure 147.

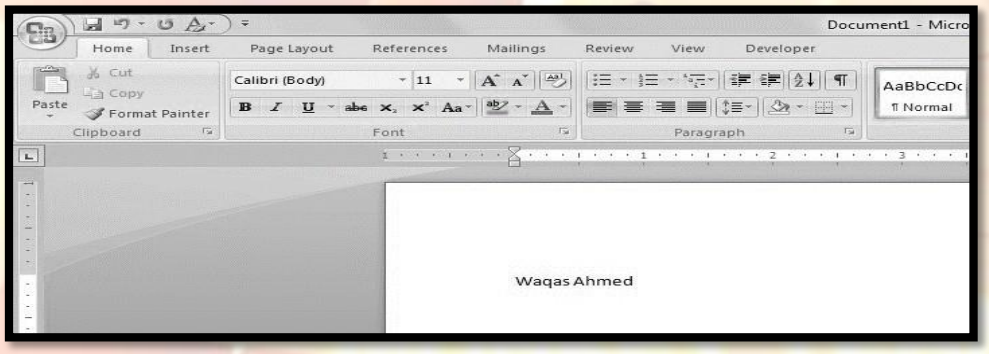


Figure 147: Typing your name

Change the font of your name to Arial. (Home Tab -> Font Group -> Font Arrow) as shown in the Figure 148.



Figure 148: Changing font

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By keep selecting the name, make it bold and underlined. (Home Tab ->Font Group -> Bold & Underline Buttons) as shown in the Figure 149.

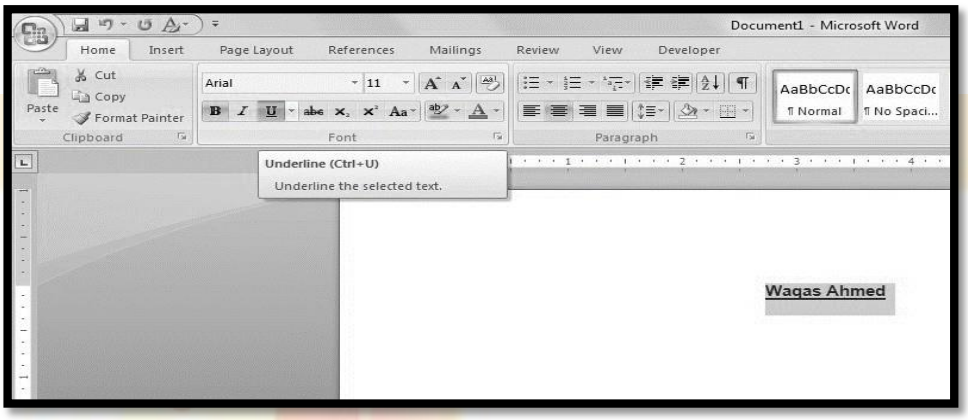


Figure 149: Applying bold and underline

Change the font size of your name to 24. (Home Tab -> Font Group -> Font Size Arrow) as shown in the Figure 150.

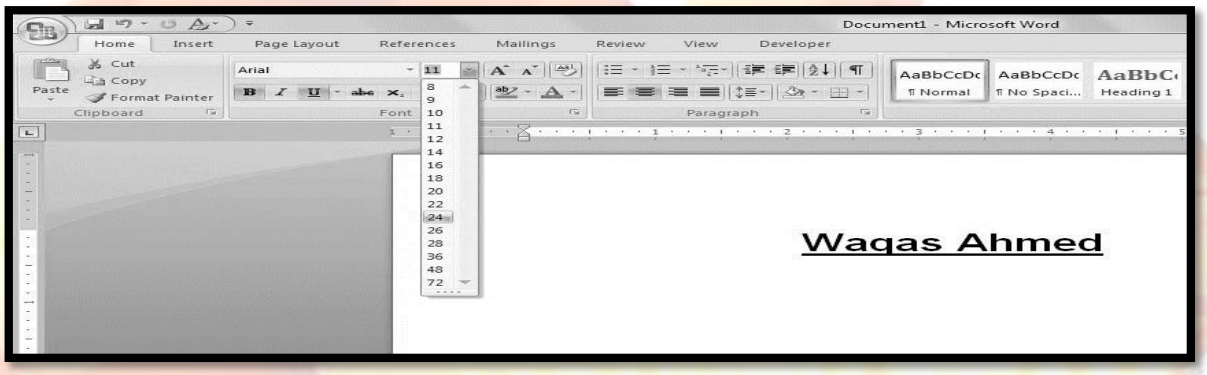


Figure 150: Changing Font Size

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Module 192

131. Word Processing: MS Word (Paragraph Group-I)

The third group on the Home ribbon is the **Paragraph** group. The paragraph group allows you to change **Paragraph Alignment** (left, right, centered, or justified), adjust **Line Spacing** within a paragraph, and adjust **spacing before and after paragraphs,** along with working with paragraph **Indentation** as shown in figure 151**.** This is also the area where you can add **bullet lists**, number **lists**, or **outlines form** to a documents. The Dialog expander arrow will open the **Paragraph dialog** window.

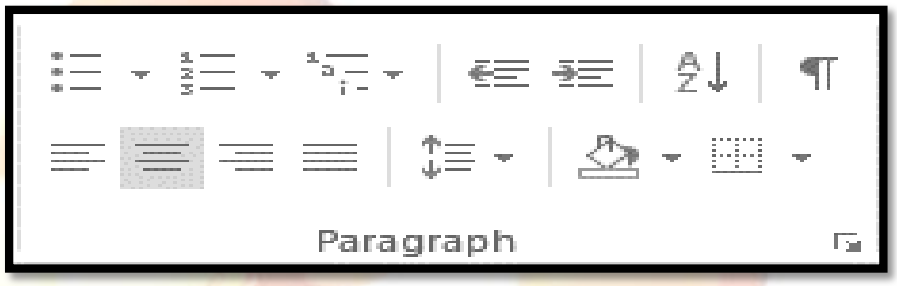


Figure 151: Paragraph Group

Bullets and Numbers

If you have lists of data, you may want to bullet or number them. When using Microsoft Word, bulleting and numbering are easy. The first part of this lesson teaches you to bullet and number.

In Microsoft Word, you can easily create bulleted or numbered lists of items. Several bulleting and numbering styles are available, as shown in the examples. You can select the one you wish to use as shown in the Figure 152 and Figure 53.

1.	Apple	1)	Apple	i.	Apple
2.	Orange	2)	Orange	ii.	Orange
3.	Grape	3)	Grape	iii.	Grape
4.	Mango	4)	Mango	iv.	Mango
5.	Cherry	5)	Cherry	v.	Cherry
A.	Apple	a)	Apple	a.	Apple
B.	Orange	b)	Orange	b.	Orange
C.	Grape	c)	Grape	c.	Grape
D.	Mango	d)	Mango	d.	Mango
E.	Cherry	e)	Cherry	e.	Cherry

Figure 152: Numbers varriations in paragraph group

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• Apple	○ Apple	▪ Apple
• Orange	○ Orange	▪ Orange
• Grape	○ Grape	▪ Grape
• Mango	○ Mango	▪ Mango
• Cherry	○ Cherry	▪ Cherry
❖ Apple	➢ Apple	✓ Apple
❖ Orange	➢ Orange	✓ Orange
❖ Grape	➢ Grape	✓ Grape
❖ Mango	➢ Mango	✓ Mango
❖ Cherry	➢ Cherry	✓ Cherry

Figure 153: Bullets variations in paragraph group



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Module 193

132. Word Processing: MS Word (Paragraph Group-II)

You can create your own bullet library. Perform the following steps:

1. Type the following list as shown:

   Apple
   Orange
   Grape
   Mango
   Cherry
2. Select the words you just typed.
3. Choose the Home tab.
4. In the Paragraph group, click the down arrow next to the Bullets button  . The Bullet Library appears.
5. Click to select the type of bullet you want to use as shown in the Figure 154. Word adds bullets to your list.

Note: As you move your cursor over the various bullet styles, Word displays the bullet style onscreen.

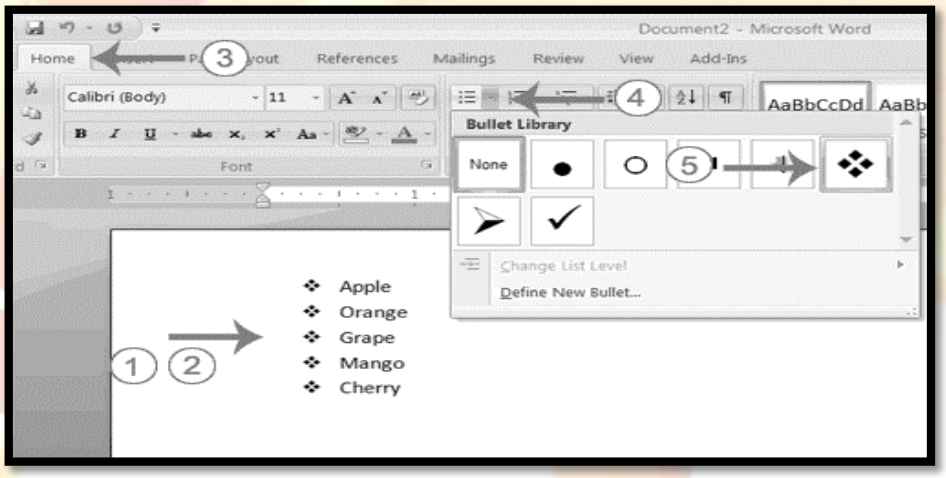


Figure 154: Bullet selection

To remove the bulleting:

1. Select the list again.
2. Choose the Home tab.
3. In the Paragraph group, click the down arrow next to the Bullets icon. The Bullet dialog box appears.
4. Click None. Word removes the bullets from your list.

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Numbers Task

1. Type the following list as shown:

Apple Orange Grape Mango Cherry

2. Select the words you just typed.
3. Choose the Home tab.
4. In the Paragraph group, click the down arrow next to the Numbering button  . The Numbering Library appears as shown in the Figure 155.

Click to select the type of numbering you want to use. Word numbers your list. **Note:** As you move your cursor over the various number styles, Word displays the number style onscreen.

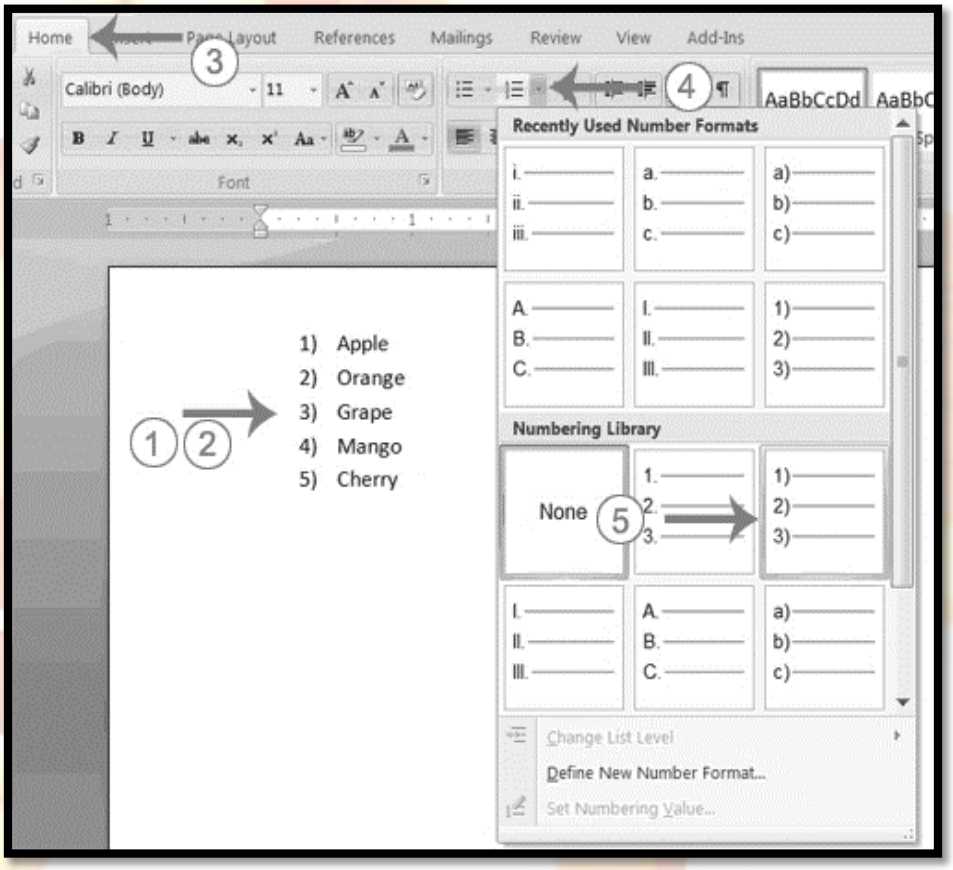


Figure 155: Adding Numbered Lists

To remove the numbering:

1. Select the list again.
2. Choose the Home tab.
3. In the Paragraph group, click the down arrow next to the Numbering icon. The Number dialog box appears.
4. Click None. Word removes the numbering from your list.

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Module 194

133. Word Processing: MS Word (Style Group)

The fourth group on the Home ribbon is the **Style** group as shown in the Figure 156. Styles are a collection of formatting options that you can apply to text. When you use styles to format your document, you can quickly and easily apply a set of formatting choices consistently throughout your document.



Figure 156: Style Group

A **style** is a set of **formatting characteristics**, such as font name, size, color, paragraph alignment and spacing. Some styles even include borders and shading. For example, instead of taking three separate steps to format your heading as 16-point, bold, Cambria, you can achieve the same result in one step by applying the built-in Heading 1 style. You do not need to remember the characteristics of the Heading 1 style. For each heading in your document, you just click in the heading (you don't even need to select all the text), and then click Heading 1 in the gallery of styles.

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Module 195

134. Word Processing: MS Word (Editing Group)

The Fifth and final group (Figure 157) on the Home ribbon is the **Editing** Group. The commands in the Editing group are **Find**, **Replace**, and **Select**. When you create a document in Microsoft Word, you may decide to change a certain word or phrase that is repeated throughout the document. Let the computer do the hard work with the **Find** and **Replace** feature in Word and you can be sure you didn't miss any.



Figure 157: Editing group

Under the **Find** command, there is the **Go To** command. The Go To command can be used to immediately go to a page, a section or any marked location within your document.

The **Select** command can be used for different purpose.

- To select all of the text in the document, click **Select All**.
- To select shapes that are hidden, stacked, or behind text, click **Select Objects**, and then draw a box over the shapes.
- To select text with similar formatting, click **Select Text with Similar Formatting**.

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Module 196

135. Word Processing: MS Word (Insert Functionalities)

Insert Tab can be used if you want to add to graphics or link your document with another document. The initial part of the insert tab in word ribbon has been shown in the Figure 158.

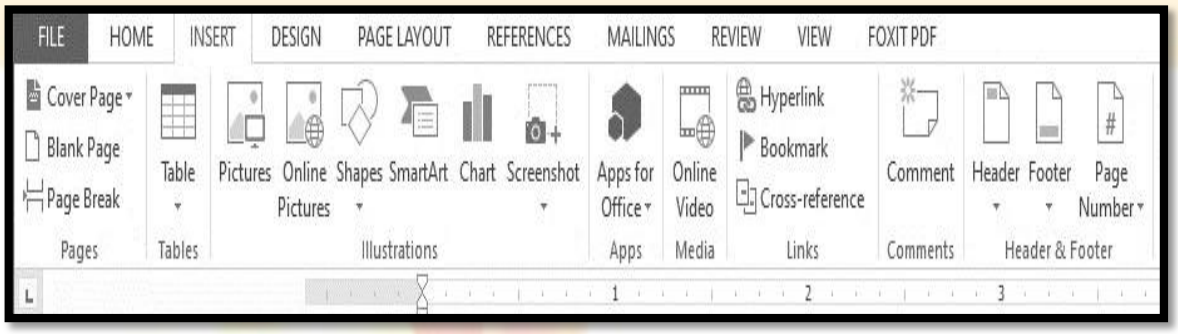


Figure 158: Inert tab

In the insert tab, the following groups are available which will be covered in the next modules:

- ✓ Pages Group
- ✓ Tables Group
- ✓ Illustrations Group
- ✓ Media
- ✓ Links
- ✓ Comments
- ✓ Header & Footer
- ✓ Text
- ✓ Symbols

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Module 197

136. Word Processing: MS Word (page Group)

Pages group is in the far left of the insert tab. You can insert from the three categories for pages which are; Cover Page, Blank Page, and Page Break as shown in the Figure 159. These features are useful if you are creating a professional or long document.



Figure 159: Pages group in the insert tab

Cover Page

Cover Page is the title page of the document. Word 2007 provides a number of preformed cover pages to give your document a professional look.

Cover page Exercise: Creating a Cover Page

1. Click the **Insert** tab to make it the active tab as shown in the Figure 158.
2. To open the **Built-in Cover Page Gallery**, click the **down arrow** to the right of **Cover Page** in the **Pages** group on the **Insert** tab as shown in the Figure 160.

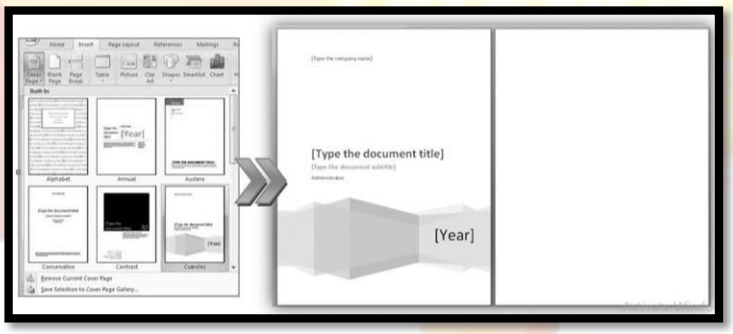


Figure 160: Inserting Cover Page

3. Scroll down and **click** the desired cover for the document from the **Cover Page Gallery**. Use the scroll bar or scroll arrow to see all the cover page choices.
4. A Cover page will be added to your document.

Remove the Cover Page

1. Click the **Insert** tab to make it the active tab.
2. To open the **Built-in Cover Page Gallery**, click the **down arrow** to the right of **Cover Page** in the Pages group on the **Insert** tab.

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3. Scroll down and select **Remove Current Cover Page** as shown in the Figure 161.

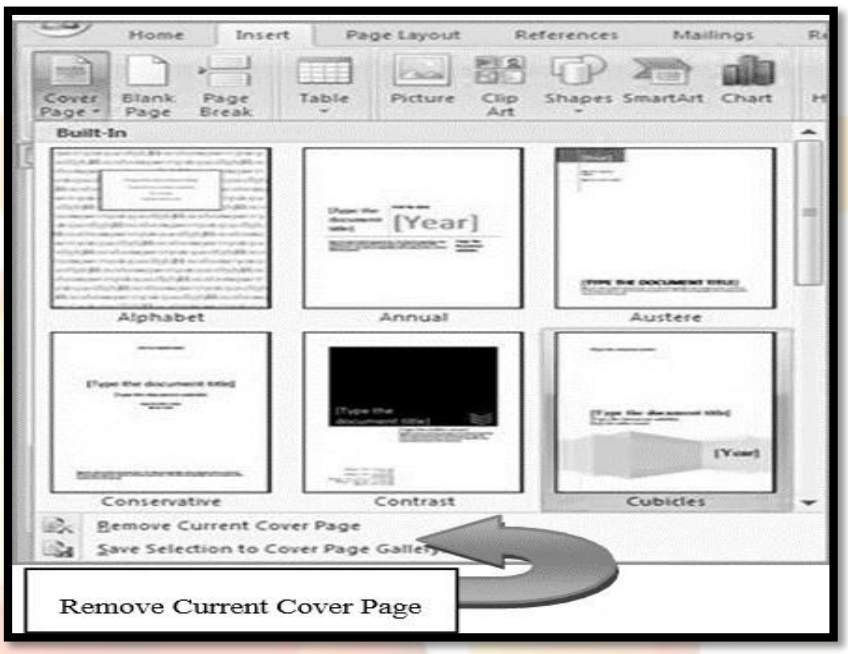


Figure 161: Removing cover page

Blank Page

Generally, Word inserts a blank page automatically while you are typing. Blank Page in Insert tab can help you add a new page anywhere in a document when required.

Try inserting a blank page to your document.

1. Click where you want to insert a new page i.e. before or after some text.
2. Click on Blank Page in Insert Tab (Figure 158).

Page Break

Page Break button will force a page break anywhere you select in your document.

1. click where you want to insert Page Break
2. Click page break (Figure 158).

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Module 198

137. Word Processing: MS Word (Table Group)

Word provides tables option for placing data in a more formal way.

1. Click on table in insert tab. (Figure 162).



Figure 162: Tables group

2. To add Rows and Columns, select top to bottom for rows & left to right for columns (Figure .163)
3. Click to apply when happy with the selection.
4. Click on the box to enter text.
5. Observe the new tab opened "Table Tools". You can use this tool to apply further formatting to your created table

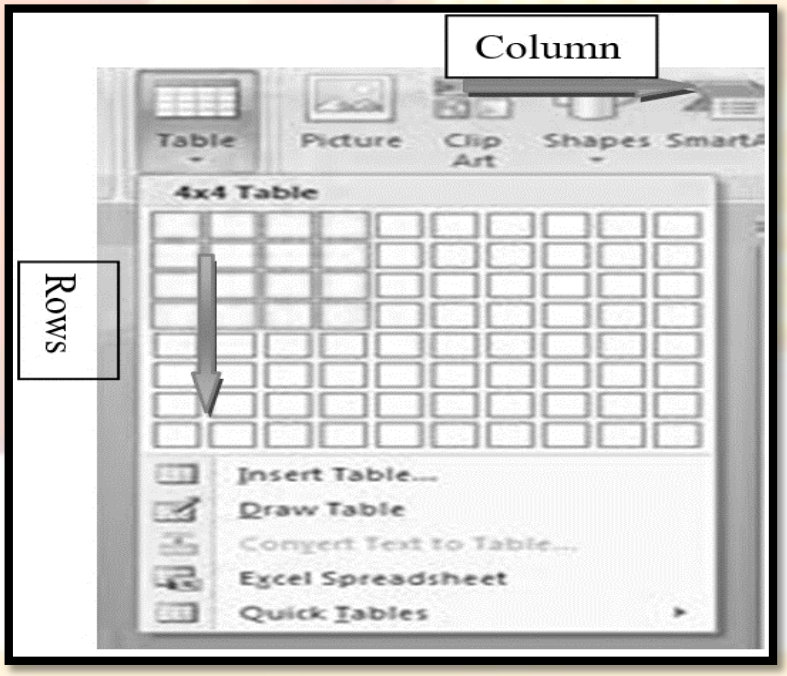


Figure 163: Selecting Rows and Columns

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Module 199

138. Word Processing: MS Word (Illustration Group)

Using Illustrations (Figure 164), you can add pictures of all types and styles to your document. Followed is detail description on how to add illustrations.

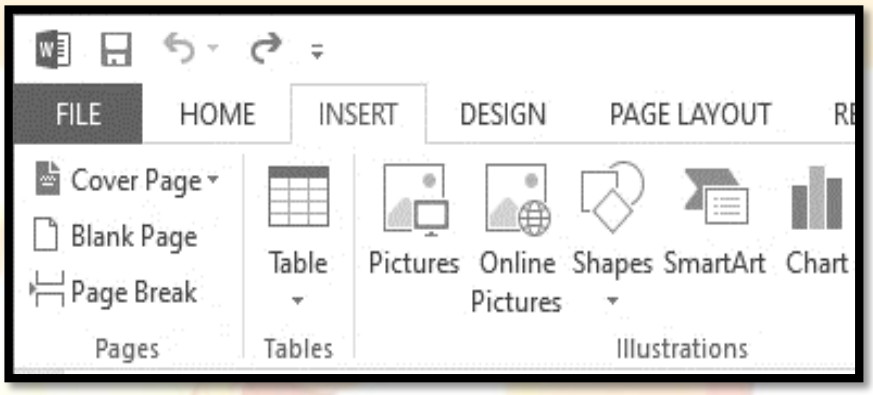


Figure 164: Illustrations

Picture

The first selection in Illustrations is Insert a picture from a file. When you click on this a window will open for you to browse to a photograph or other picture you have saved on your computer.

Clip Art

To illustrate a specific concept, you can Insert Clip Art in your document, including media file (sound and video clips) and drawing.

Shapes

Word 2007 provides a wide range of shapes (Figure 165) to select and insert in your document as per your requirement. It also provides Canvas to place all the Shapes at one place without being disturbed when further changes are made as shown in the figure 166. Each shape belongs to one of the following subcategory i.e. Lines, Basic Shapes, Block Arrows, Flow Charts, Callouts, Stars and Banners.

1. Click on Shapes in Insert Tab and draw a new Canvas Figure 165.
2. Insert shapes given in Figure 166.
3. Arrange inserted shape to form Snow Man as done in Figure 167.

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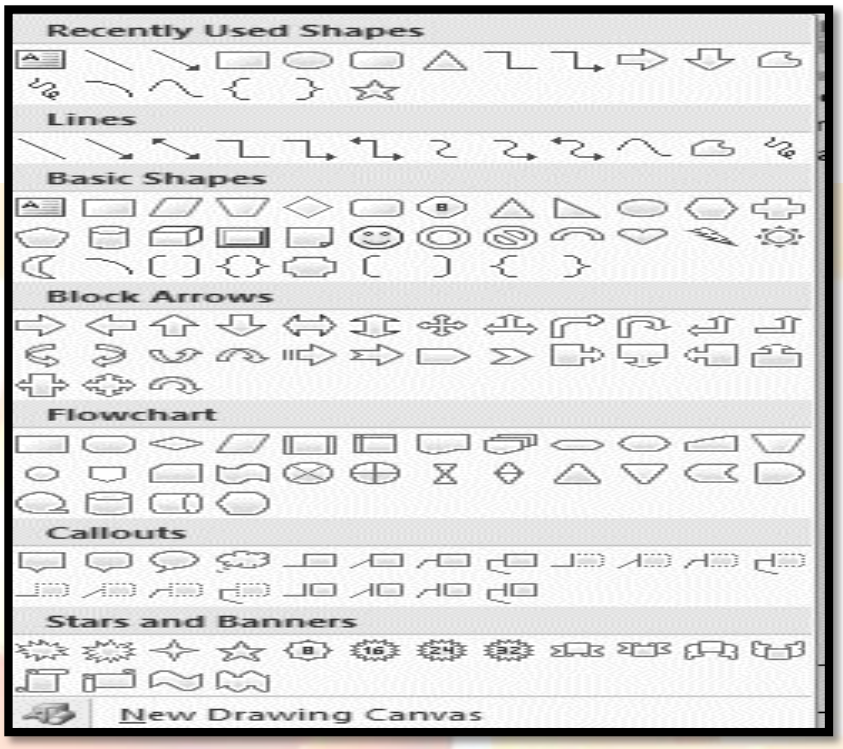


Figure 165: Shapes types in Word

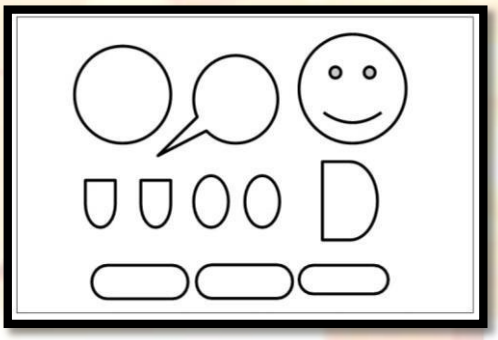


Figure 166: Shapes required to make snowman

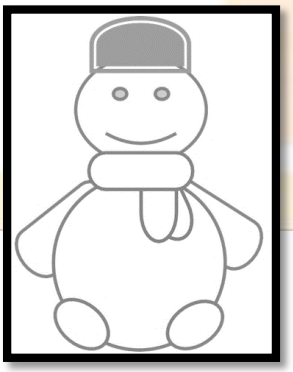


Figure 167: Snowman

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Smart Art

A new feature introduced in Word 2007 is Smart Art. Using Smart Art, you can communicate your ideas visually. Whether it's a process, hierarchy or life cycle all can be illustrated using Smart Art as shown in the Figure 168.

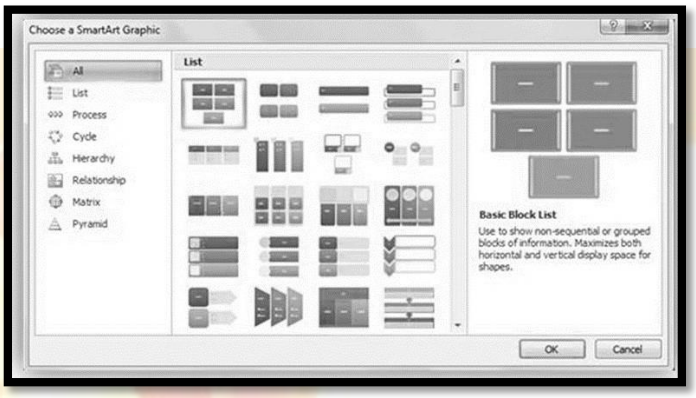


Figure 168: Smart Art

Exercise: How to add Cycle Smart Art

1. Click on Smart Art Button in Illustration group of Insert Tab
2. Click Cycle in the left pane of opening window (Figure 169)
3. Select Basic Cycle Figure 169.
4. Click On [TEXT] to add text. "Baby", "Child", "Teen" and "Adult". Notice the extra Circle left (Figure 170).

Click on the remaining circle and press Delete (Del) Key on your keyboard to remove it (Figure 171).

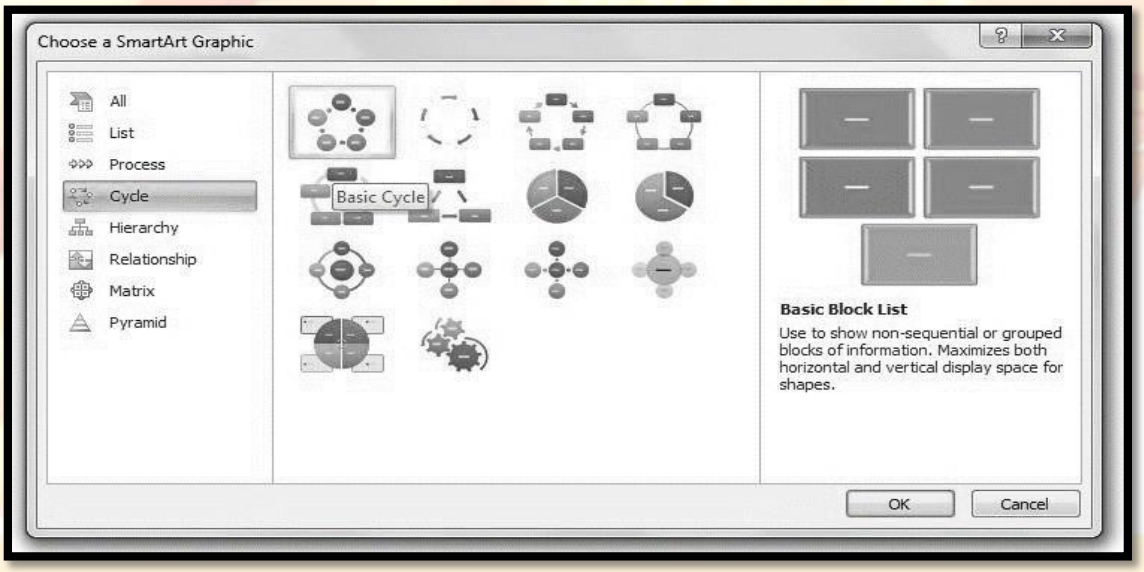


Figure 169: Basic cycle

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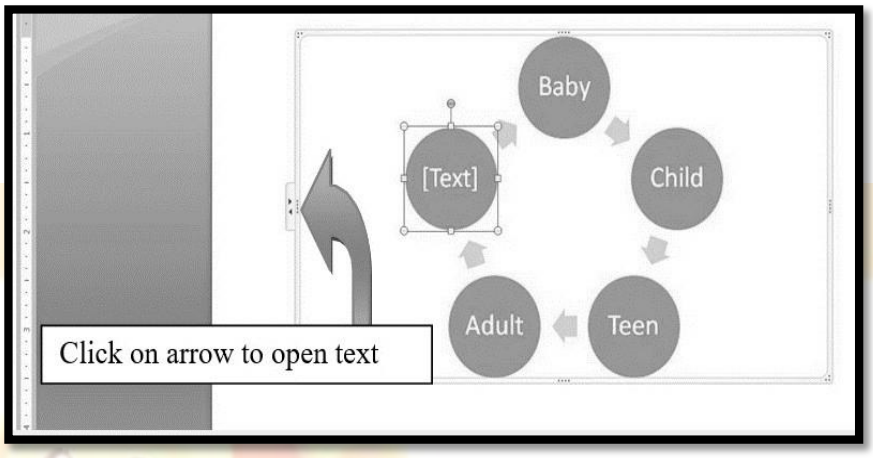


Figure 170: Human Life Cycle

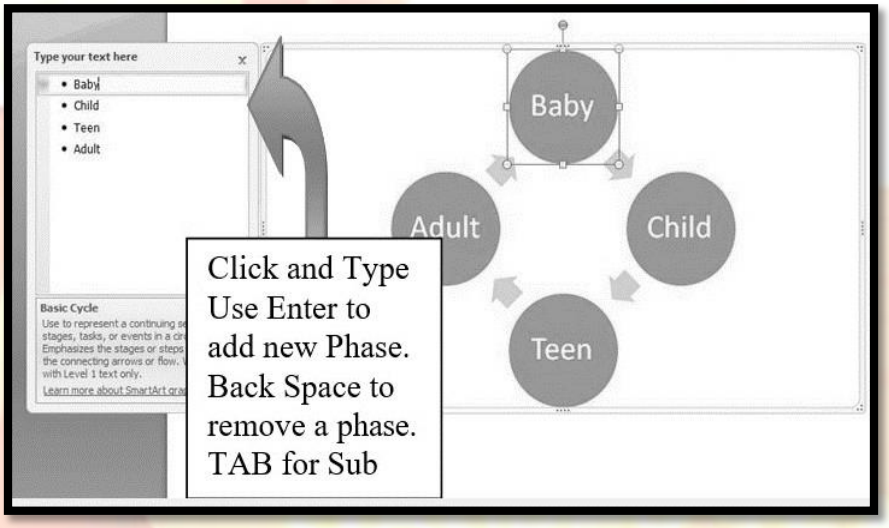


Figure 171: Adding and Removing Objects

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Module 200

139. Word Processing: MS Word (Media and Links Groups)

Links toolbox (Figure 172) in Insert tab helps link other documents in your current document and also helps you keep track of reading by providing Bookmark facility.

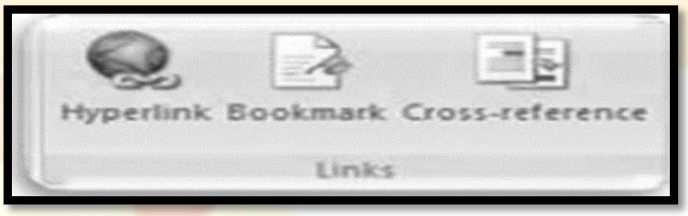


Figure 172: Links group

Hyperlink

Hyperlink is used to add link of other documents or web pages in your Document. Here is how you can add Hyperlink. Click on hyperlink in insert ribbon tab, a window will open as in the Figure 173.

1. Enter word or phrase to display hyperlink
2. Click to add text displayed when mouse is over the hyperlink text
3. Select Bookmark
4. Select respective option to locate file or web links that you want to add in document
5. Address bar
6. You can link to various files i.e. existing file in your system, link to place within document (ideal to link table of contents with headings).

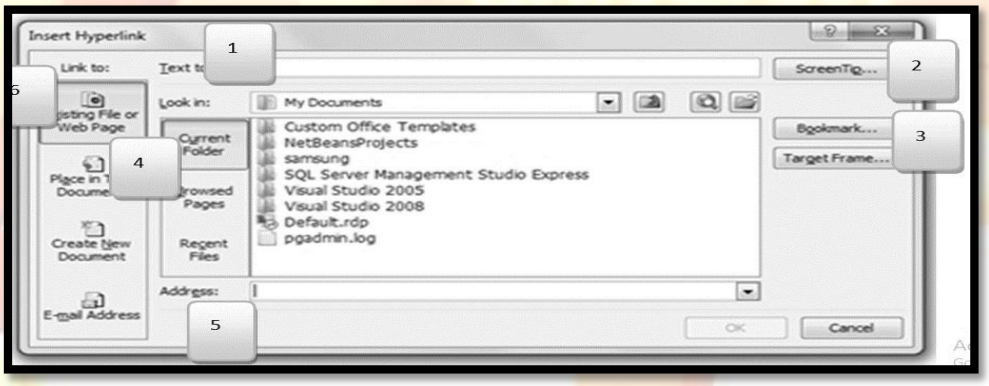


Figure 173: Adding Hyperlink

Bookmarks

Bookmarks are a way to keep track of reading. They are similar to bookmarks you keep while reading a favorite novel or story book like, turn the corner of the page or place pen or pencil.

Bookmarks Exercise: How to Use Bookmark

1. Click where you want to place bookmark.
2. From insert ribbon tab select bookmark (Figure 174)
3. Enter bookmark name say" Mark1" (without space) and click add.

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4. To continue from where you placed bookmark repeat step 2 and select saved "Mark1" bookmark.

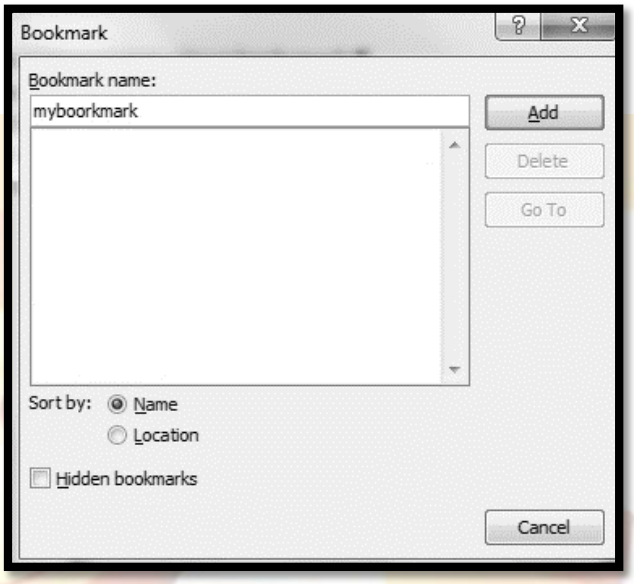


Figure 174: Adding Bookmark

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Module 201

140. Word Processing: MS Word (Comments and Header & footer)

Header and Footers are areas where you can add Text or Graphics. Any formatting applied in these areas will be shown throughout the document. A header is at the top margin; a footer is printed in the bottom margin For Example observer the top of this page and all the pages in the document you will see same header and footer format.

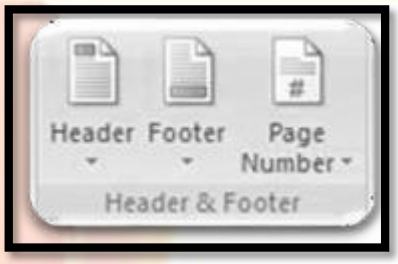


Figure 175: Header and Footer

Exercise: How to Use Header & Footers

1. Click on insert ribbon tab select header.
2. Page header will open in edit mode. (Figure 176)
3. Enter text "Virtual University of Pakistan, as shown in the Figure 176.
4. Close header& footer (Figure 177).

Similarly, you can add footer. Please note you can even add images to the header, footer or both.



Figure 176: Header in edit mode

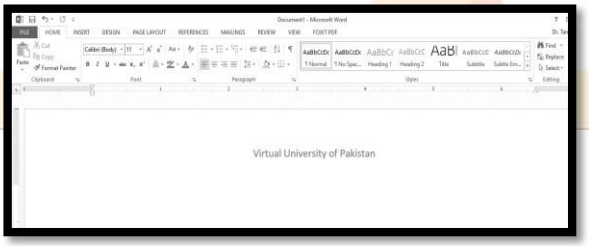


Figure 177: After Header Insertion

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Module 202

141. Word Processing: MS Word (Text Group (Part-1))

Text Box in Insert Ribbon tab can be used to add graphical formatting. This has been shown in the Figure 178.



Figure 178: Text group

Exercise: How to Use Text box (Figure 179)

1. Click the Text Box button, located in the Text group on the Insert tab. From the menu that appears, choose Draw Text Box.
2. Click where you want one corner of the text box to appear and drag to where you want the opposite corner.
3. Release the mouse button and then type your text.

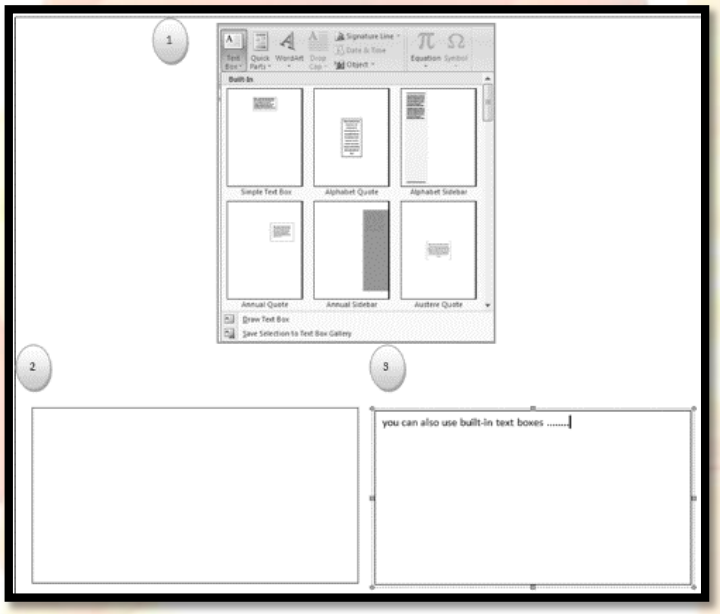


Figure 179: Adding Text Box

Quick parts

Quick Parts are a new feature in Word 2007 that allows you to save text or graphics in what Microsoft calls "Building Blocks" and then call it up quickly when you need it. This is especially handy for inserting information such as a Company Name, Logo, Company Address or any other information that you use often.

Exercise: How to Create a Quick Part

1. Select the text you want to reuse. To include paragraph formatting, make sure you select the ending paragraph mark.
2. Click the Insert tab on the Ribbon.
3. Click the Quick Parts button and click Save Selection to Quick Part Gallery.
4. Enter in the desired properties for the Quick Part.
5. To insert a Quick Part that you have saved, click the Quick Parts button and choose the Quick Part you want to use.

Word Art

WordArt can be used to produce special text effects in a Microsoft Word document. For example, you can create curved, slanted, or three-dimensional text by inserting a WordArt object.

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Exercise: How to add Word Art

1. On the Insert tab and then Click WordArt.
2. In the WordArt Gallery dialog box, double-click the style that you want (Figure 180).
3. In the Edit WordArt Text dialog box, type your text and select font and size.
4. Click Bold or Italic to make all the text bold or italic. (Note you cannot apply bold or italic to only a part of the text.).
5. In the Edit WordArt Text dialog box, click OK. To insert into the document.

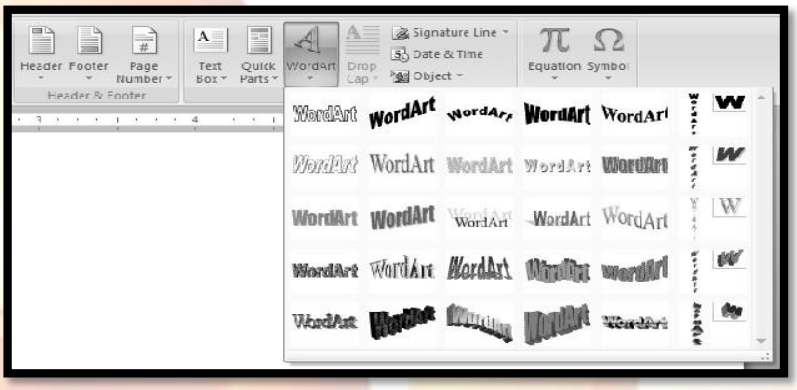


Figure 180: Word Art Gallery

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Module 203

142. Word Processing: MS Word (Text Group (Part-II) and Symbols Group)

Drop Cap

A drop cap is a specially formatted letter that appears at the beginning of a paragraph just like you see in newspapers or in books. Microsoft word offers drop caps in two styles. Most commonly used drop cap begins the paragraph with a large letter that spills down into the text. Thus, the drop cap shifts the first few lines of the paragraph.

Exercise: How to Use Drop Cap

1. Type the paragraph as you normally would.
2. Open the Insert tab on the Ribbon and click the Drop Cap button.(Figure 181)
3. Choose the drop cap style you want to use.
4. Adjust the drop cap, if you want to.

Symbols

Another feature found is Microsoft Word is Symbols. You can add pre-made mathematical Equations and various Symbols where required in your document. However, if you cannot find what you want, you can also create your own equations.

Exercise: Using Symbols

1. Locate the Equation button in the Symbols group of the Insert tab on the Ribbon.
2. Click the button (not its menu triangle), and two things happen. First, an equation control is inserted into your document at the insertion pointer's location. Second, the Equation Tools Design tab appears on the Ribbon.

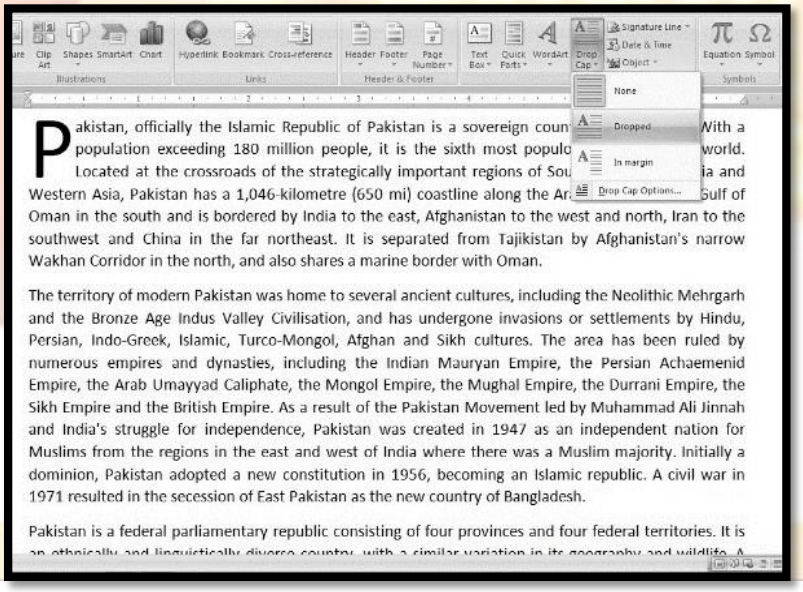


Figure 181: Drop cap 'P'

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Module 204

143. Word Processing: MS Word (Design Ribbon)

Design ribbon (as shown in the Figure 182) contains the following groups:



Figure 182: Design Ribbon

Themes - Drop-Down. The drop-down contains the commands: Built-in, More Themes on Microsoft Office Online, Browse for Themes and Save Current Theme. The built-in themes are: Office, Apex, Aspect, Civic, Concourse, Equity, Flow, Foundry, Median, Metro, Module, Opulent, Oriel, Origin, Paper, Solstice, Technic, Trek, Urban and Verve. Tooltip indicates the current theme. The default theme is "Office". Tooltip indicates the current theme. Quick Access to more themes saved down on Microsoft Office Online. Default theme is "Office". Changes the overall design of the entire document including colors, fonts and effects. This drop-down has an additional command not found in Excel or PowerPoint which is "Reset to Theme from Template".

Style Set - Change the look of your document by choosing a new style set. Style sets change the font and paragraph properties of your entire document.

Colors - Drop-Down. Displays a list of all the available colors and lets you change the color component of the active theme.

Fonts - Drop-Down. Displays a list of all the available fonts and lets you change the font component of the active theme.

Paragraph Spacing - Drop-Down. Quickly change the line and paragraph spacing in your document. The drop-down contains the commands: No Paragraph Space, Compact, Tight, Open, Relaxed, Double, Custom Paragraph Spacing.

Effects - Drop-Down. Displays a list of all the available effects and lets you change the effect component of the active theme. The drop-down contains the commands: Office, Apex, Aspect, Civic, Concourse, Equity, Flow, Foundry, Median, Metro, Module, Opulent, Oriel, Origin, Paper, Solstice, Technic, Trek, Urban and Verve.

Set As Default - Use the current look for all new documents.

Page Background – This tab contains watermark, page color and page borders as shown in the Figure 183.

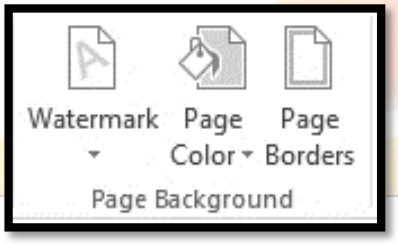


Figure 183: Page background group

Page Color – Drop-Down. Let's you change the background color of the page. Displays the full theme color palette.

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Page Borders – Displays the "Border and Shading" dialog box.

Watermarks

Watermarks in the documents can be attractive, but they aren't just about looks: A watermark can be a way of letting the reader know that the document is confidential.

Exercise: How to add Watermark

1. Click the Watermark button on the Page Layout tab.
2. Click one of the watermarks to insert it or select Custom Watermark from the bottom of the gallery.
3. To select text for your custom watermark, select the Text Watermark option in the Printed Watermark dialog box. Then use the controls to select the language and the text to be used. Click OK.

You can also select a picture to be used for the watermark by selecting the Picture Watermark option and then using the Select Picture button to find the image you want to use. For most images, you want to leave the Washout option selected, which makes the text on top of the image easier to read.

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Module 205

144. Word Processing: MS Word (Page Setup Group in Page Layout Ribbon)

Using page setup group (Figure 184), you can easily place margins, display text in two or three columns, Add section break or even set page setup.

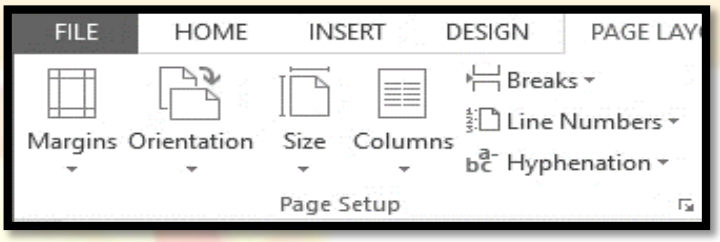


Figure 184: Page setup group

Displaying Text in two Columns

As you might have observed in newspapers text is displayed in two or three columns. Microsoft Word provides this feature in Page Layout Ribbon tab. By default the text is displayed in one column format. Here's how you can display in two columns.

Exercise: How to add Columns

1. Select text that you want to display in column form. (Figure 185)

In Page Layout Tab click on Columns and select "Two". See Figure 186.

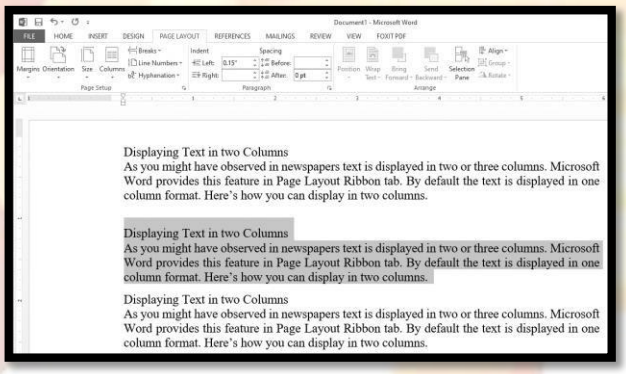


Figure 185: Text selections for 2-columns display

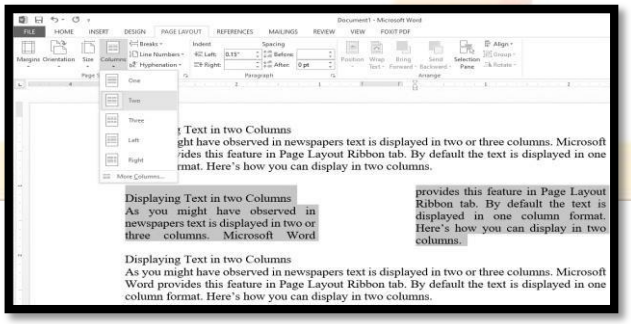


Figure 186: Text in two columns

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Module 206

145. Word Processing: MS Word (Page Setup Group in Page Layout Ribbon)

You can quickly display the "Paragraph" dialog box, Indents and Spacing tab, by clicking on the launcher in the bottom right corner of this group. These are options taken from the (Format Paragraph)(Indents and Spacing tab) for quick access.

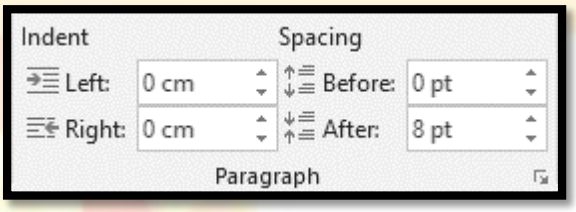


Figure 187: Paragraph group in page layout

Indent Left - TextBox. This automatically updates to indicate how much indentation has been applied to the paragraph of the current selection. This can be used to change the left indentation for the current selection.

Indent Right - TextBox. This automatically updates to indicate how much indentation has been applied to the paragraph of the current selection. This can be used to change the right indentation for the current selection.

Spacing Before - TextBox. This automatically updates to indicate how much spacing is defined before the paragraph of the current selection. This can be used to change the spacing for the current selection. **Spacing After** - TextBox. The automatically updates to indicate how much spacing is defined after the paragraph of the current selection. This can be used to change the spacing for the current selection.

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Module 207

146. Word Processing: MS Word (Arrange Group in Page Layout Ribbon)

This group also appears on the Drawing Tools - Format contextual tab as shown in the Figure 188.

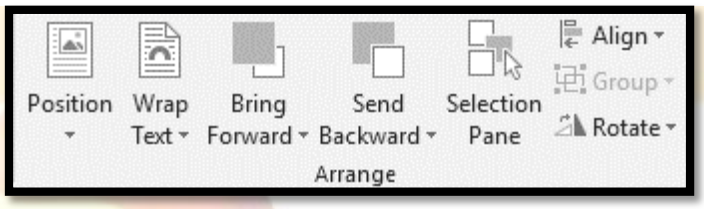


Figure 188: Arrange Group

Position - Drop-Down. Displays a list of picture positioning options. The drop-down contains the commands: In Line with Text and Text Wrapping. You can select More Layout Options to display the "Advanced Layout" dialog box.

Wrap Text – Drop-Down. The drop-down contains the commands: In Line with Text, Square, Tight, Through, Top and Bottom, Behind Text, In Front of Text, Edit Wrap Points and More Layout Options.

Bring Forward - Button with Drop-Down. The button brings the selected object forward one level. The drop-down provides a command to bring the selected object in front of all the other objects. **Send Backward** - (Send to Back in 2007). Button with Drop-Down. The button brings the selected object back one level. The drop-down provides a command to send the selected object to the back of all the other objects.

Selection Pane - (Added in 2010). Displays the Selection Pane task pane.

Align - Drop-Down. The drop-down contains the commands: Align Left, Align Center, Align Right, Align Top, Align Middle, Align Bottom, Distribute Horizontally, Distribute Vertically, Align to Page, Align to Margin, Align Selected Objects, View Gridlines and Grid Settings. The Grid Settings displays the "Drawing Grid" dialog box.

Group - Drop-Down. The drop-down contains the commands: Group, Regroup and Ungroup.

Rotate - Drop-Down. The drop-down contains the commands: Rotate Right 90, Rotate Left 90, Flip Vertical, Flip Horizontal and More Rotation Options.

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Module 208

147. Word Processing: MS Word (References Ribbon)

This tab gives you access to all the commands for creating references within your documents.

Table of Contents - Drop-Down. Provide an overview of your document by adding a table of contents. The drop-down contains the commands: Built-in, Insert Table of Contents and Save Selection to Table of Contents Gallery as shown in the Figure189.



Figure 189: Table of Content

Add Text - Drop-Down. The drop-down contains the commands: Do Not Show in Table of Contents, Level 1, Level 2 and Level 3.
Update Table - Updates the table of contents so that all the entries refer to the correct page numbers.

Footnotes - You can quickly display the "Footnote and Endnote" dialog box by clicking on the dialog box launcher in the bottom right corner of this group as shown in the Figure 190.

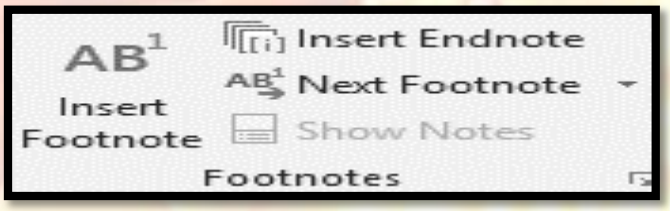


Figure 190: Footnotes Group

Insert Footnote - (Alt + Ctrl + F). Inserts a footnote at the current position. Footnotes are automatically renumbered as you move text around the document.

Insert Endnote - (Alt + Ctrl + D). Inserts an endnote at the end of the document. End notes are always placed at the end of a document.
Next Footnote - Button with Drop-Down. The button moves to the next footnote. The drop-down provides the commands Next Footnote, Previous Footnote, Next Endnote and Previous Endnote.
Show Notes - Shows where footnotes and endnotes are located.

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Module 209

148. Word Processing: MS Word (Proofing Group in Review Ribbon)

The proofing group is shown in the Figure 191.

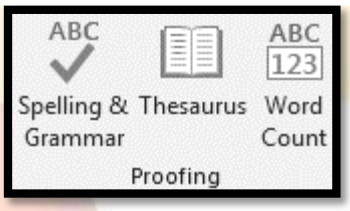


Figure 191: Proofing group

Spelling & Grammar - Displays the "Spelling and Grammar" dialog box. This allows you to check the spelling and grammar in the active document.

Thesaurus - Toggles the display of the Research task pane defaulting the research service to the thesaurus. Same as Excel.

Word Count - This displays the "Word Count" dialog box displaying the document statistics. This replaces the Word Count toolbar. This dialog box can also be displayed by clicking on the word count indicator on the status bar.

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Module 210

149. Word Processing: MS Word (Language Group in Review Ribbon)

The language group has been shown in the Figure 192.



Figure 192: Language group

Translate - Drop-Down. Displays the Research task pane. This drop-down contains the commands: Translate Document, Translate Selected Text, Mini Translator and Choose Translation Language. **Language** - Drop-Down. This drop-down contains the commands: Set Proofing Language and Language Preferences. Set Proofing Language display the "Language" dialog box. Language Preferences displays the "Options" dialog box, Language Tab.

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Module 211

150. Word Processing: MS Word (Comments Group in Review Ribbon)

The comments group has been shown in the Figure 193.

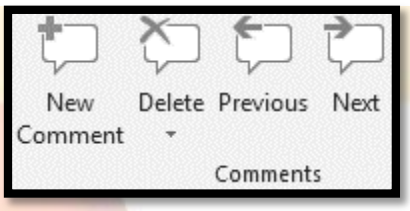


Figure 193: Comments group

New Comment - (Shift + F2). Inserts a comment at the active cell. This command does not change to Edit Comment when a comment is selected like it does in Excel.

Delete - Button with Drop-Down. Deletes the selected comment. The button deletes the comment in the active selection. The drop-down contains the commands: Delete All Comments Shown and Delete all comments in Document. This is disabled when the document does not contain any comments.

Previous - Goes to the previous comment in the active document. This is disabled when the document does not contain any comments.

Next - Goes to the next comment in the active document. This is disabled when the document does not contain any comments.

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Module 212

151. Word Processing: MS Word (Tracking and Changes Groups in Review Ribbon)

The Tracking group has been shown in the Figure 194.

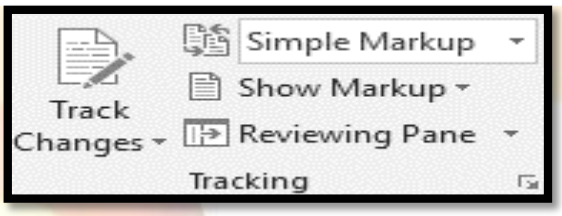


Figure 194: Tracking group

Track Changes - (Ctrl + Shift + E). Button with Drop-Down. The button is the Track Changes command from the Reviewing. It contains the commands Track Changes, Change Tracking Options and Change Username. Change Tracking Options displays the Track Changes Options dialog box. Change Username displays the Word Options dialog box (Popular tab).

Show Markup - Drop-Down. The drop-down contains the commands: Comments, Ink, Insertions and Deletions, Formatting, Markup Area Highlight.

Reviewing Pane - Button with Drop-Down. The button toggles the display of the Reviewing pane. The drop-down contains the commands: Reviewing Pane Vertical and Reviewing Pane Horizontally. There is now also summary information at the top of the pane.

The changes group is shown in the Figure 195.

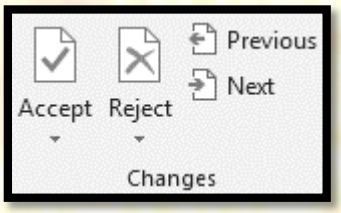


Figure 195: Changes group

Accept - Button with Drop-Down. The button is the Accept and Move to Next command which accepts the current change and moves to the next proposed change. The drop-down contains the commands: Accept and Move to Next, Accept Change, accept all Changes Shown and Accept all Changes in Document. This drop-down is disabled when the document is protected.

Reject - Button with Drop-Down. The button is the Reject and Move to Next command which rejects the current change and moves to the next proposed change. The drop-down contains the commands: Reject and Move to Next, Reject Change, reject all Changes Shown and Reject all Changes in Document. This drop-down is disabled when the document is protected.

Previous - Moves to the previous revision in the active document. This is a bit confusing as it does exactly the same as the Previous in the comments group.

Next - Moves to the next revision in the active document.

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Module 213

152. Word Processing: MS Word (Compare and Protect Groups in Review Ribbon)

The Compare group is shown in the Figure 196.



Figure 196: Compare group

Compare - Drop-Down. The drop-down contains the commands: Compare and Combine. The Compare command lets you compare two versions of the same document and displays the "Compare Documents" dialog box. The Combine command lets you combine revisions from multiple authors and displays the "Combine Documents" dialog box. This drop-down is disabled when the document is protected.

The protect group is shown in the Figure 197.

Block Authors - Drop-Down. Prevent others from making changes to the selected text.

Restrict Editing - Toggles the display of the Restrict Editing task pane. **Protect Document** - The drop-down contains the commands: Unrestricted Access, Restricted Access, Manage Credentials.



Figure 197: Protect group

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Module 214

153. Word Processing: MS Word (View Ribbon)

The View ribbon contains Views group, Show Group, Zoom Group, and Windows group. The Views group contains all the commands relating to the different ways you can view your documents as shown in the Figure 198.



Figure 198: Views group

Read Mode – It maximizes the Word window on the screen and removes all toolbars etc to allow easy reading.

Print Layout - Displays the document as it would appear if printed and is the default view.

Web Layout - Displays the document as it would appear as a web page.

Outline - Displays the document as an outline is displays the Outlining contextual tab.

Draft - Displays the document in draft mode allowing for quick editing. When using this view certain aspects of the document are not visible, for example any headers or footers.

The show group is shown in the Figure 199.

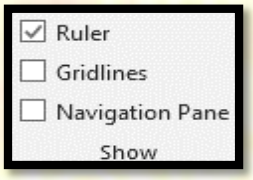


Figure 199: Show group

Ruler - Toggles the display of the ruler(s).

Gridlines - Toggles the display of gridlines.

Navigation Pane - Toggles the display of the Navigation task pane. This is a combination of the Find, Document Map and Thumbnails.

The Zoom group is shown in the Figure 200.

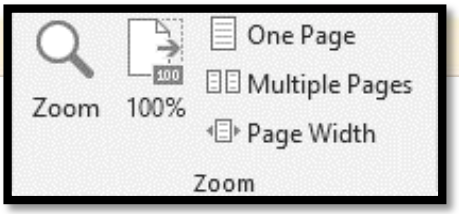


Figure 200: Zoom group

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Zoom - Displays the "Zoom" dialog box. This can also be accessed from the status bar by clicking on the view percentage.

100% - Adjusts the zoom to 100% of its normal size. Lets you quickly return to 100%.

One Page - Adjust the zoom so an entire page fits in the application window.

Two Pages - Adjust the zoom so two entire pages fit in the application window.

Page Width - Adjust the zoom so the width of the page is the same as the width of the application window.

The Windows group has been shown in the Figure 201. Every document you open in Word can be thought of as a window. It is possible to open multiple windows of the same document.

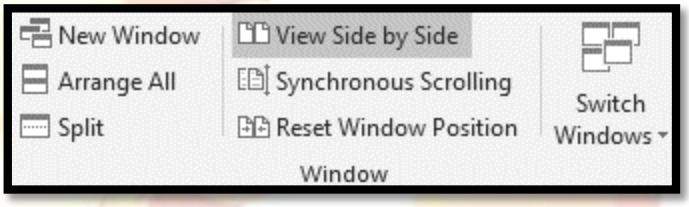


Figure 201: Windows group

New Window - Lets you create a new window of the active document. **Arrange All** - Tile all the open windows side by side on the screen. This will also maximize the application / document to a full screen.

Split - Splits the current window into two parts.

View Side by Side - Displays two documents side by side so they can be easily compared. If you have more than two documents open the "Compare Side by Side" dialog box is displayed so you can choose which document to display next to the active document, allowing you to scroll multiple windows at the same time.

Synchronous Scrolling - Toggles the synchronize scrolling of the two documents that are displayed side by side. This is only enabled when you are viewing two documents side by side.

Reset Window Position - Resets the windows positions so they take up the same amount of space on the screen when two documents are displayed side by side. This is only enabled when you are viewing two documents side by side.

Switch Windows - Drop-Down. Lets you switch between all the currently active documents. This displays all the window/documents that are currently open in the particular session.

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Module 215

154. Presentations: MS-PowerPoint (Introduction)

Microsoft offers another powerful tool known as MS-PowerPoint. This is used to develop presentations. Microsoft PowerPoint is an easy program to use and a powerful tool for giving a presentation. Whether your presentation needs a visual kick, tools for collaboration, easy access or the ability to share information beyond the initial meeting, PowerPoint is a good option. It can even help reduce speaking anxiety by drawing eyes away from the speaker and towards a screen. Just do not expect this technology to substitute for sound and dynamic speaking skills. All ribbons of MS Powerpoint are shown in the Figure 202.

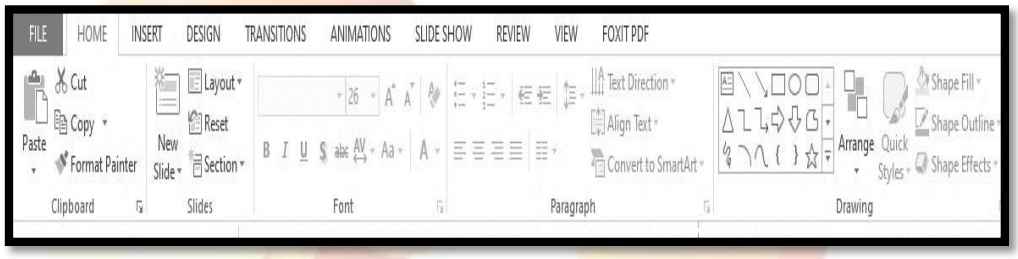


Figure 202: MS: Powerpoint

Some of the functions in different groups in Powerpoint are exactly same as per the functions in MS: Word. We will only cover those groups and functions which are new in the MS: Powerpoint as compared to the MS: Word. These groups and their functionalities will be discussed in the next modules.

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Module 216

155. Presentations: MS-PowerPoint (Slides Group on Home Ribbon)

The Slides group is shown in the Figure 203.



Figure 203: Slides group in home ribbon

New Slide - Button with Drop-Down. The button inserts a new blank Title and Content Slide. The drop-down contains the slides: Title Slide, Title and Content, Duplicate Selected Slides, Slides from Outline and Reuse Slides.

Layout - Drop-Down. The drop-down contains the commands: Title Slide and Title and Content.

Reset - Reset the position, size and formatting of the slide placeholders to their default settings.

Delete - Removes the slides currently selected.

Module 217

156. Presentations: MS-PowerPoint (Design Ribbon)

The design ribbon is the ribbon that helps you to design your slides as per your requirement. The first group is called the: "Themes" as shown in the Figure 204. This helps to choose the required theme of your presentation. You can try different themes to see the difference.

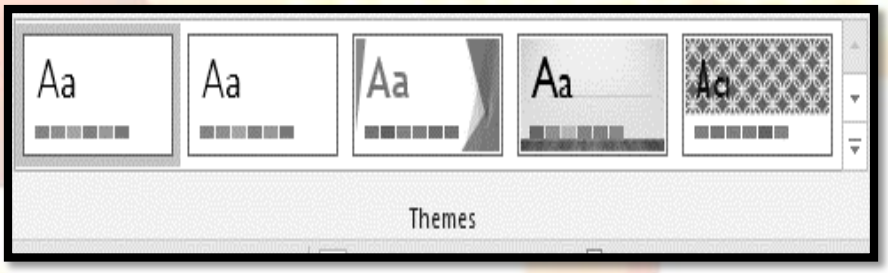


Figure 204: Themes group

Furhermore, you can select slide size in the next group and format background according to your requirements.

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Module 218

157. Presentations: MS-PowerPoint (Transition Ribbon)

If you've ever seen a PowerPoint presentation that had special effects between each slide, you've seen **slide transitions**. A transition can be as simple as fading to the next slide or as flashy as an eye-catching effect. PowerPoint makes it easy to apply transitions to some or all of your slides, giving your presentation a polished, professional look. The transition ribbon has "Transition to this slide" group as shown in the Figure 205.



Figure 205: Transition group

Once you are done with one typical transition style, the next thing is to configure other options available in the Figure 206.

Sound – You can add any sound file over here which you need to play in this transition
Duration – you can set the duration of the transition.
Apply to All - Set the transition between all the slides in the presentation to be the same as this slide.
On Mouse Click - Lets you wait until there is a mouse click before moving on to the next slide.

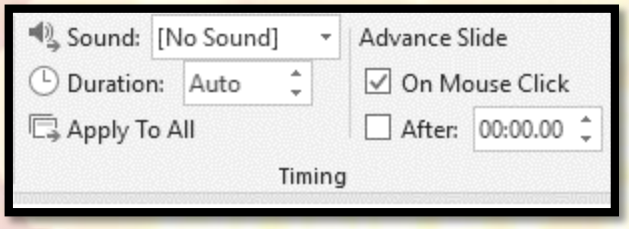


Figure 206: Transition timing group

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Module 219

158. Presentations: MS-PowerPoint (Animation Ribbon)

Transition discussed in the last module were the animations added in between slides. Whereas, If you want to animate text, an image, shape, graph or chart within the slide, this is the type of animation you select.

There are variety of animations available as shown in the Figure 207.

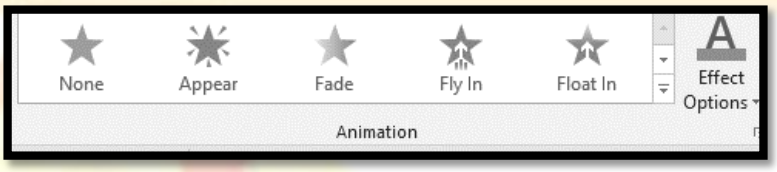


Figure 207: Animations group

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Module 220

159. Spreadsheets: MS Excel (Introduction)

What is a Spreadsheet?

Suppose you would like to maintain personal finance register also known as check register that will keep track of the expenditures that you have been making during the current semester. Another scenario can be the budget management of a small house. You may be interested in question such as how much money has been spent on electricity bills and telephone bills. How much saving has been made? You may imagine a book that keeps record of all transaction/ expenditures and income. Such a book can be called a manual or paper spreadsheet. A sample is shown in the Figure 208. In this case you may have to save data that can be numerical or alphanumeric (involving letters or numbers).

Spreadsheet is a tool that is used to organize data, such as a check register. Spreadsheets have been used for many, many years in business to keep track of expenses and other calculations.

Electronic Spreadsheet: Microsoft Excel is an example of spreadsheet application program that can be used for storing, organizing and manipulating data. The key benefit to using a spreadsheet program is that you can make changes easily, including correcting spelling or values, adding, deleting and formatting. It consists of a grid made from columns and rows similar to what you have seen in your Mathematics notebooks in school days. This grid environment makes number manipulation very easy.

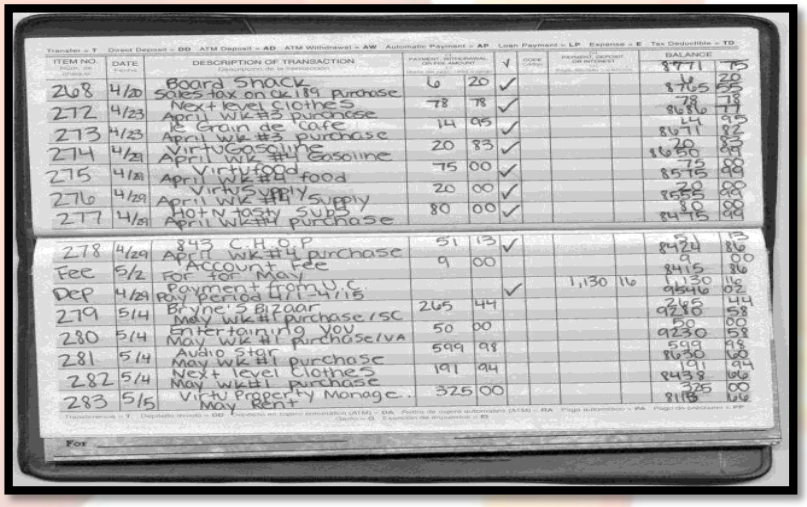


Figure 208: Spread Sheet Example

Please refer to Figure 209 to observe the layout of MS Excel. On the top you will find a ribbon similar to MS Word and PowerPoint that we will be discussing shortly. The different thing you will notice is the rectangular boxes on the screen divided with the help of rows and columns

Rows are identified by Numbers as shown in the leftmost columns whereas Columns are identified by Alphabets as shown in the topmost row.

If you want to select a particular cell, you will have to identify its address. The selected cell in the Figure 209. For. e.g. is A1, A being the first column and 1 being the first row

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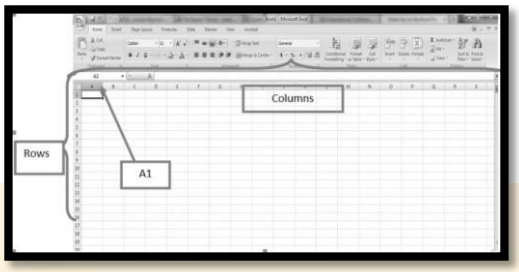


Figure 209: Excel Layout

Cell Formatting

The cell formatting is show in the Figure 2010. You can adjust the row height by clicking "Auto fit row height". This will adjust the height of all the cells in a row according to the font size of the data you have inserted.

Charts

Charts allow you to present information contained in the worksheet in a graphic format. Excel offers many types of charts including: Column, Line, Pie, Bar, Area, Scatter and more. To view the charts available click the Insert Tab on the Ribbon.

Creating a Chart:

- ✓ Select the cells that contain the data you want to use in the chart. In our example we can select the shipping cost column to be used as chart data.

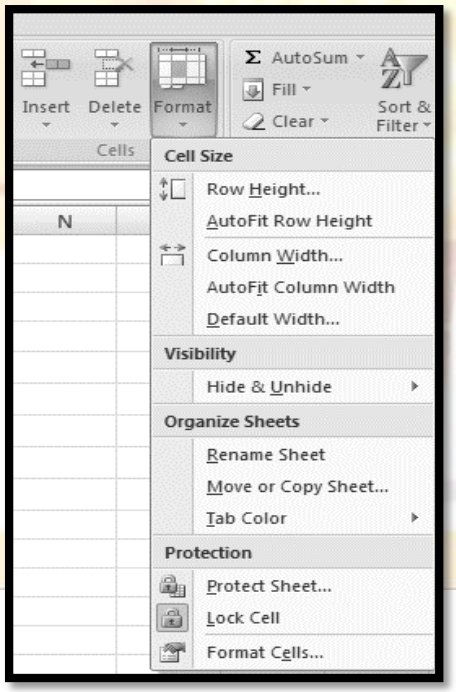


Figure 210: Cell formatting

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- ✓ Click the Insert tab on the Ribbon
- ✓ Click the type of Chart you want to create. There are different chart types as show in the Figure 211.

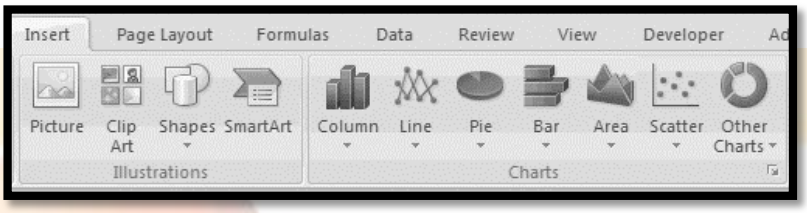


Figure 211: Charts group

- ✓ Click the Column chart button and then select the 2d chart
- ✓ A bar chart will appear showing the shipping cost as chart as shown in Figure 212.
- ✓ You can observe the costs at the Y-axis and as there are four items so you can see 4 bars at X-axis
- ✓ This chart has four components and you can right clock on them separately to see the advance options available.



Figure 212: Chart example in Excel

Module 221

160. Spreadsheets: MS Excel (Functions)

A formula is a set of mathematical instructions that can be used in Excel to perform calculations. Formals are started in the formula box starting with an = sign. A sample formula is shown in Figure 213.

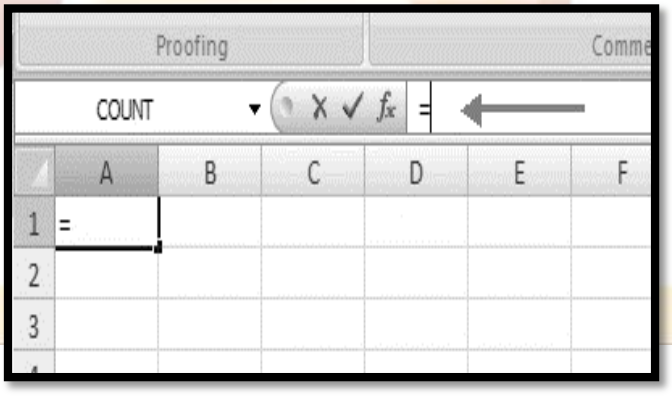


Figure 213: Formula Example

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The formula ribbon is shown in the Figure 214. This ribbon gives you different options for applying formulas. The first section represents Function library. Function library contains different formulas from various categories. Figure 214 gives you an overview of the Formula ribbon.



Figure 214: Formula ribbon

Creating Basic Formula

To create a basic formula in Excel we need the data on which to apply the formula. Data is represented in Figure 215.

Product	Price	Shipping Cost
Toothpaste	25	10
Shampoo	120	20
Soap	30	10
MouthWash	50	15

Figure 215: Data for Sum Formula

To create a basic formula, you need to do the following:

Select the cell for the formula

Type "=" (the equal sign) and the formula

The formula is of sum which would sum the values.

":" is used to specify the range of the cell on which you want to apply the formula

Click Enter

Creating a basic formula is shown in the Figure 216.

Product	Price	Shipping Cost	Total Price
Toothpaste	25	10	=sum(F5:G5)
Shampoo	120	20	
Soap	30	10	
MouthWash	50	15	

Figure 216: Sum Formula

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When you click enter you would get the result as shown in figure 217 the label 1 represents the formula applied to get the desired result and label 2 represents the result after applying the formula.



Product	Price	Shipping Cost	Total Price
Toothpaste	25	10	35
Shampoo	120	20	140
Soap	30	10	40
MouthWash	50	15	65

Figure 217: Result of Sum Formula

Calculate with Functions

A function is a built in formula in Excel. A function has a name and arguments (the mathematical function) in parentheses.

- ✓ Sum: Adds all cells in the argument
- ✓ Average: Calculates the average of the cells in the argument
- ✓ Min: Finds the minimum value
- ✓ Max: Finds the maximum value
- ✓ Count: Finds the number of cells that contain a numerical value within a range of the argument

To calculate a function:

- ✓ Click the cell where you want the function applied
- ✓ Click the Insert Function button
- ✓ Choose the function
- ✓ Click OK

The process of calculating through a function is shown in figure 218.

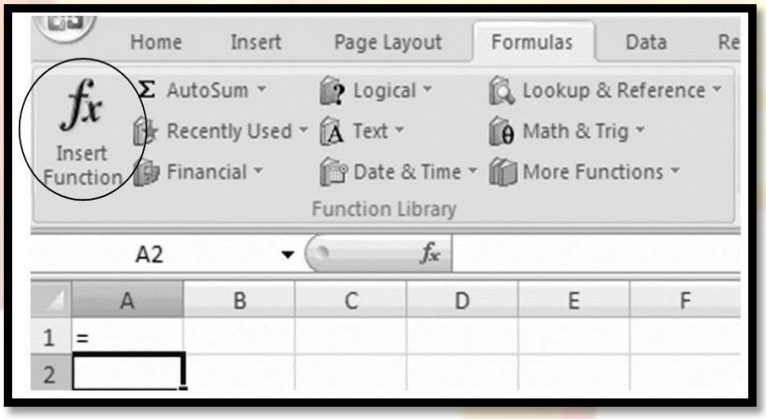


Figure 218: Function Computation

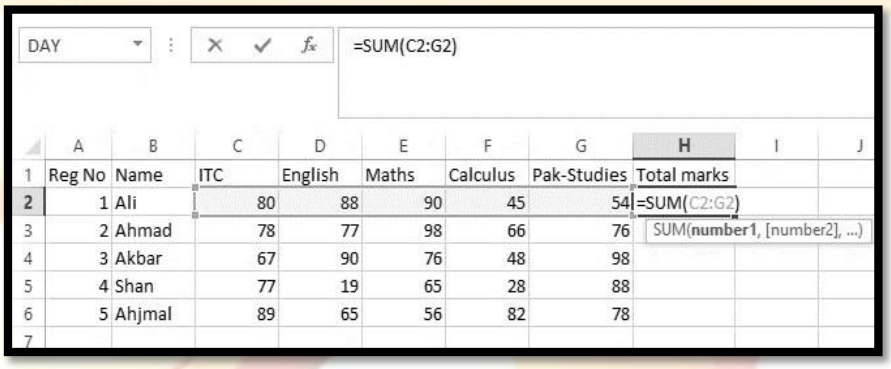
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Module 222

161. Spreadsheets: MS Excel (Application Scenarios-I)

After learning the formulas in details in the last module. Lets apply those in the real scenario.

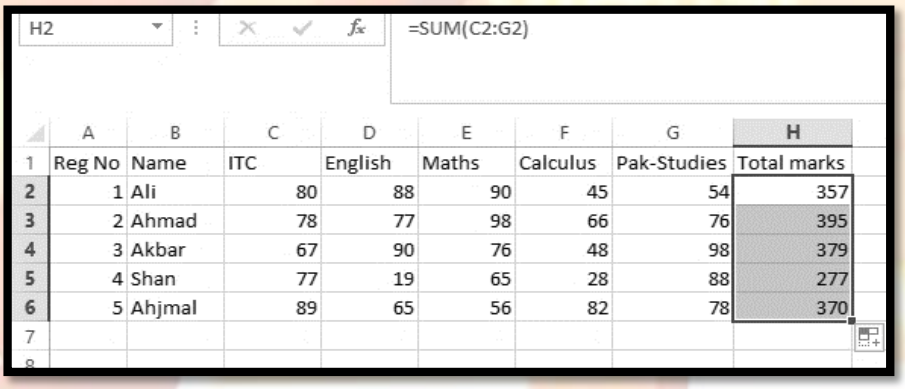
Consider the Figure 219 which contains the data of five students and their marks in five subjects. We want to add the total marks of each student. The formula has been written for your reference.



	A	B	C	D	E	F	G	H	I	J
1	Reg No	Name	ITC	English	Maths	Calculus	Pak-Studies	Total marks		
2	1	Ali	80	88	90	45	54	=SUM(C2:G2)		
3	2	Ahmad	78	77	98	66	76			
4	3	Akbar	67	90	76	48	98			
5	4	Shan	77	19	65	28	88			
6	5	Ahjmal	89	65	56	82	78			
7										

Figure 219: Sum of marks

When this formula is applied and copied in the following cells, the result can be seen in the Figure 220.



	A	B	C	D	E	F	G	H
1	Reg No	Name	ITC	English	Maths	Calculus	Pak-Studies	Total marks
2	1	Ali	80	88	90	45	54	357
3	2	Ahmad	78	77	98	66	76	395
4	3	Akbar	67	90	76	48	98	379
5	4	Shan	77	19	65	28	88	277
6	5	Ahjmal	89	65	56	82	78	370
7								

Figure 220: Result of sum formula

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Module 223

162. Spreadsheets: MS Excel (Application Scenarios-II)

Let's apply the learned formulas in another application scenario. Remember, in the module 220, we mentioned a scenario that if you want to manage your personal expenses on a register, its very difficult to perform different queries. In this module, we will consider this scenario and will perform number of queries on this example.

The Figure 221 contains the personal expenses details of the year 2020 month wise in different heads.

	A	B	C	D	E	F	G	H
1	Perosnal Expenses for the Year 2020							
2	Months	Electricity Bill	Sui-gas Bill	Grocery	Tuition Fees	Broadband Bill	Car maintenance	Total Expenses
3	January	5000	528	15821	50000	5412	15241	
4	February	7000	635	17852	50000	5412	12345	
5	March	8457	425	18241	50000	5412	14235	
6	April	5697	525	14250	50000	5412	15152	
7	May	8574	852	19245	56000	5412	14162	
8	June	9585	741	13258	56000	5412	13252	
9	July	7568	247	17412	56000	5412	18654	
10	August	10258	259	28935	56000	5412	17420	
11	September	7532	635	25878	56000	5412	14582	
12	October	3218	526	24125	60000	5412	16254	
13	November	7521	325	10741	60000	5412	18521	
14	December	2358	741	12365	60000	5412	13254	
15								
16	Total Expense							
17								

Figure 221: Personal expense sheet

Now our first query is to see the total expense for the January month. The applied formula can be seen in the Figure 222 and its result can be seen in the Figure 223.

	A	B	C	D	E	F	G	H
1	Perosnal Expenses for the Year 2020							
2	Months	Electricity Bill	Sui-gas Bill	Grocery	Tuition Fees	Broadband Bill	Car maintenance	Total Expenses
3	January	5000	528	15821	50000	5412	15241	=sum(b2:g3)
4	February	7000	635	17852	50000	5412	12345	
5	March	8457	425	18241	50000	5412	14235	
6	April	5697	525	14250	50000	5412	15152	
7	May	8574	852	19245	56000	5412	14162	
8	June	9585	741	13258	56000	5412	13252	
9	July	7568	247	17412	56000	5412	18654	
10	August	10258	259	28935	56000	5412	17420	
11	September	7532	635	25878	56000	5412	14582	
12	October	3218	526	24125	60000	5412	16254	
13	November	7521	325	10741	60000	5412	18521	
14	December	2358	741	12365	60000	5412	13254	
15								
16	Total Expense							
17								

Figure 222: Finding total expense for the January month

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	A	B	C	D	E	F	G	H
1	Perosnal Expenses for the Year 2020							
2	Months	Electricity Bill	Sui-gas Bill	Grocery	Tuition Fees	Broadband Bill	Car maintenance	Total Expenses
3	January	5000	528	15821	50000	5412	15241	92002
4	February	7000	635	17852	50000	5412	12345	185246
5	March	8457	425	18241	50000	5412	14235	190014
6	April	5697	525	14250	50000	5412	15152	187806
7	May	8574	852	19245	56000	5412	14162	195281
8	June	9585	741	13258	56000	5412	13252	202493
9	July	7568	247	17412	56000	5412	18654	203541
10	August	10258	259	28935	56000	5412	17420	223577
11	September	7532	635	25878	56000	5412	14582	228323
12	October	3218	526	24125	60000	5412	16254	219574
13	November	7521	325	10741	60000	5412	18521	212055
14	December	2358	741	12365	60000	5412	13254	196650
15								
16	Total Expense							

Figure 223: Result of query from Figure 222

Now if we are interested to see what the total expense of the Electricity Bill is, we can apply the following formula and can copy it in the next cell to see the result as shown in the Figure 224.

=sum(b3:b14)

	A	B	C	D	E	F	G	H
1	Perosnal Expenses for the Year 2020							
2	Months	Electricity Bill	Sui-gas Bill	Grocery	Tuition Fees	Broadband Bill	Car maintenance	Total Expenses
3	January	5000	528	15821	50000	5412	15241	92002
4	February	7000	635	17852	50000	5412	12345	185246
5	March	8457	425	18241	50000	5412	14235	190014
6	April	5697	525	14250	50000	5412	15152	187806
7	May	8574	852	19245	56000	5412	14162	195281
8	June	9585	741	13258	56000	5412	13252	202493
9	July	7568	247	17412	56000	5412	18654	203541
10	August	10258	259	28935	56000	5412	17420	223577
11	September	7532	635	25878	56000	5412	14582	228323
12	October	3218	526	24125	60000	5412	16254	219574
13	November	7521	325	10741	60000	5412	18521	212055
14	December	2358	741	12365	60000	5412	13254	196650
15								
16	Total Expense	82768	6439	218123	660000	64944	183072	2336562

Figure 224: Total bill Expense-head wise

Similarly, you can try the following formulas as well:

=average(b3:b14)

=max(b3:b14)

=min(b3:b14)

The total expense for the year 2020 can be seen after applying the following formula:

=SUM(B16:H16)

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Module 224

163. Spreadsheets: MS Excel (Sorting and Filter)

Sorting and Filtering allow you to manipulate data in a worksheet based on given set of criteria. You can sort the data in ascending and descending order. There are two types of sorts in Microsoft Excel i.e. Basic Sorts and Custom Sorts.

Basic Sort

To execute a basic descending or ascending sort based on one column perform the following steps:

- Highlight the cells that will be sorted
- Click the Sort & Filter button on the Home tab

Click the Sort Ascending (A-Z) button or Sort Descending (Z-A) button.

These steps are shown in the Figure 225.



Figure 225: Sort and Filter

Custom Sort

To sort on the basis of more than one column:

- ✓ Click the Sort & Filter button on the Home tab
- ✓ Choose which column you want to sort by first
- ✓ Click Add Level
- ✓ Choose the next column you want to sort
- ✓ Click OK

This process is represented in the Figure 226.

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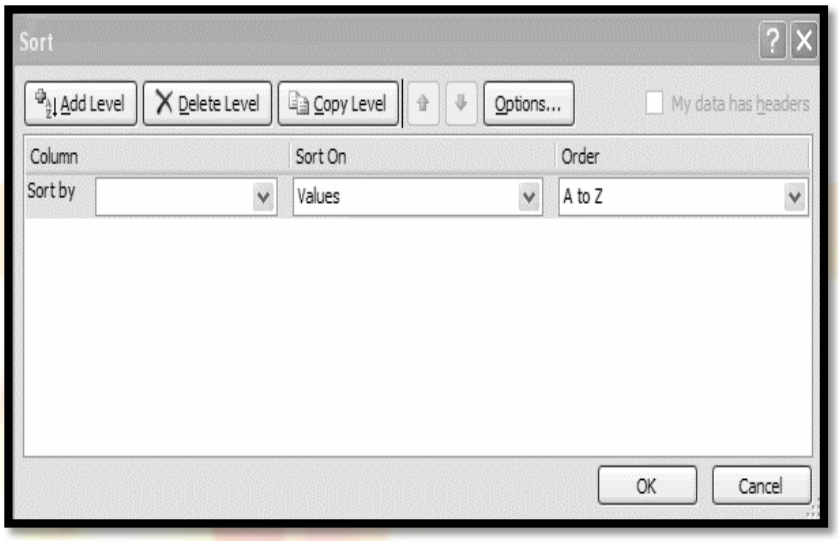


Figure 226: Custom Sort

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Module 225

164. Database: MS Access (Introduction)

Database is collections of files which are also referred as tables. Information is organized in these tables in the form of fields and records for easy access and management purpose.

SQL stands for structured query language. In order to access and retrieve data from the database we use SQL. This is the most commonly used syntax for querying a relational database.

It is important to understand the difference between Database and DBMS. Let's understand this difference with an analogy of office Cleric. Office cleric organize and stores different files in the filing cabinet whenever he needs to access information from the file or add new information in the file he goes to the filling cabinet and retrieve the file which he has already stored in the filling cabinet. After updating the information in the file he stores the file back to the filling cabinet. In the above example Database is the filling cabinet where the information is stored in the form of files. And the analogy of DBMS is the office cleric, whose job is to organize and retrieve files.

You should be quite familiar with the ribbon as presented in the MS Word and MS Excel. The similar ribbon is available in MS Access. The same ribbon is also present in Access with few modifications. There is addition of three new tabs i.e. Create, External data and Database Tools as shown in the Figure 227.

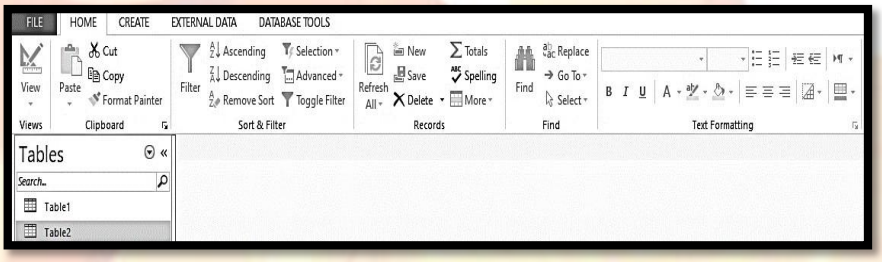


Figure 227: MS Access ribbon

To create a new database

- ✓ Click on Blank database option as shown in Figure 228
- ✓ Type Database name and browse to location where you save the new database.

Click Create button to create database. (Figure 229).

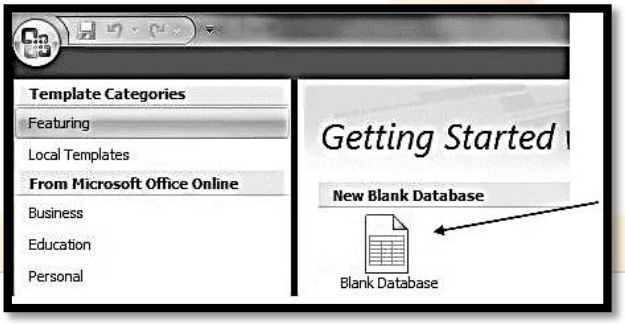


Figure 228: Create Blank Database

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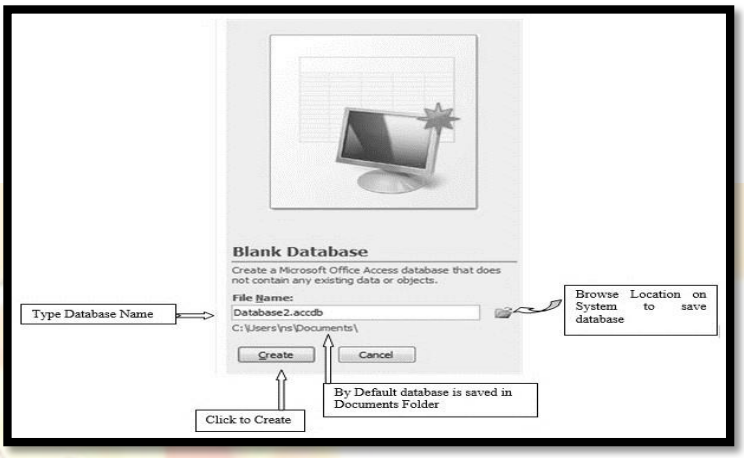


Figure 229: Naming and saving database

Navigation Panel

When your database is created new window screen appear and by default table is added. On the left side of the window is navigation panel (Figure 230) here you will see all your saved tables, forms, queries and reports. On the Right of the navigation pane is working or view panel. You can view table data, query output, generate reports and form here.

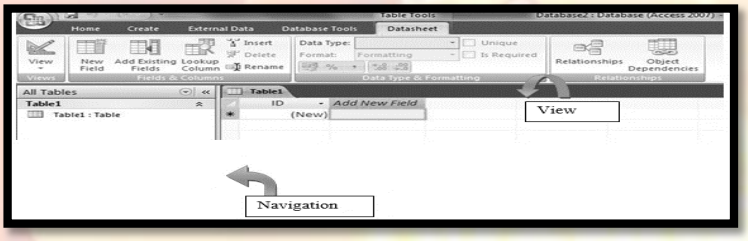


Figure 230: Blank Database

External data

External data tab is used to import, export, collect and share data between different databases. You can also export and import data from excel document as shown in the Figure 231.



Figure 231: External data Ribbon

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Module 226

165. Database: MS Access (Creating and Managing Tables)

Create Tab in the Ribbon helps you to provide quick and easy way to create tables, forms, report and queries as shown in the Figure 232.

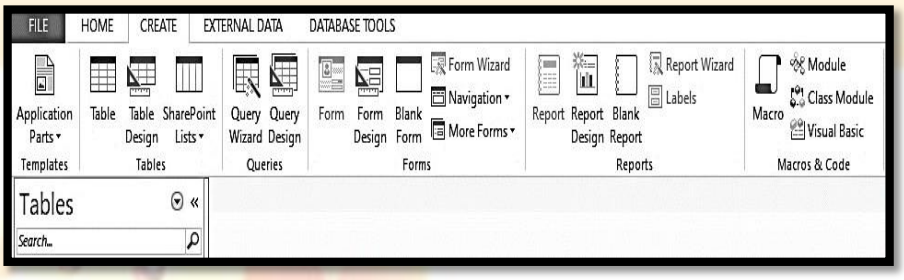


Figure 232: Create tab

Tables Group

Tables in Access are used to store data. It is a set of columns and rows. Each column in table is referred to as a field. Each value in the field signifies a single type of data. Numbers of Record are number of rows in a Table hence each row of a table is referred to as a single record.

Exercise: Create Courses Table

1. Click on Create tab (Figure 232).
2. Click Table in Tables group. A blank table with default Name “Table 1” is created.
3. Click on Design view. A popup dialogue box will appear with a text box with “Table 1”.
4. Rename the table name to “courses” and click OK.
5. In Design view click on second row in field name column.
6. Add a new field for course title as “ctitle”. Set its data type to “Text”.
7. Add another field for section as “csection”. Set its data type to number.
8. Add a new field name for course Instructor as “cinstructor”. Set its data type to “Text”.
9. To return to datasheet view click on view button and select.
10. A Popup dialogue box will appear to save the changes, click yes to continue.
11. In datasheet view your newly added fields are visible.
12. Insert 10 courses data.
13. Close table.

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Module 227

166. Database: MS Access (Creating Forms)

Forms option provides you the ability to enter new record and navigate through existing records easily. You can arrange fields in different layouts add Icon and also apply designs as can be seen in the Figure 232.

Creating Form for Student Table

1. Select student table. Double click to open.
2. Click Create tab.
3. From the Forms group Select Form (Figure 232).
4. A Form will be created with Table Fields as Labels followed by Text Boxes (Figure 233)
5. Use Crtl+ S key to Save or right click on form tab "student" and select save.
6. In the popup dialogue box enter form name "studentForm" and click OK.
7. Your newly created form will show in Navigation Pane.(Figure 234)

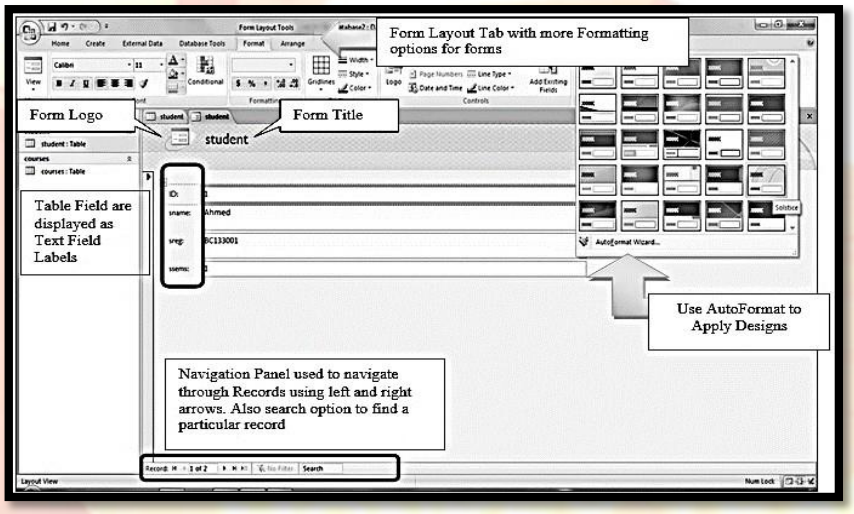


Figure 233: Student Table Form

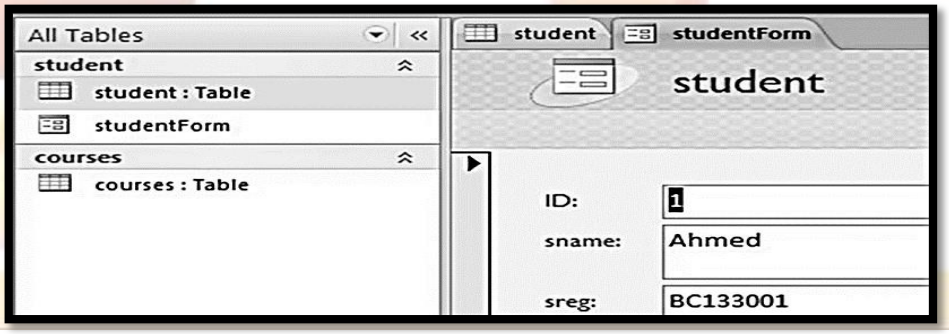


Figure 2334: Saved Form "studentForm"

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Module 228

167. Database: MS Access (Creating Reports)

Reports are organized and summarized form of your data so you can print or view it onscreen. Reports are often use when you want to analyze your data or present it to others. It is available as an independent group of Figure 232.

Creating Report for Student Table

1. Select student table. Double click to open.
2. Click Create tab.
3. From the Reports group select report (Figure 235).
4. A Report will be generated as shown in Figure 236.
5. Use Crtl+ S key to Save or right click on form tab "student" and select save.
6. In the popup dialogue box enter form name "srudentReport" and click OK.
7. In the Navigation Pane you can see your newly created form by the name you have saved.(Figure 236)
8. Rename Report Title to "studentReport".

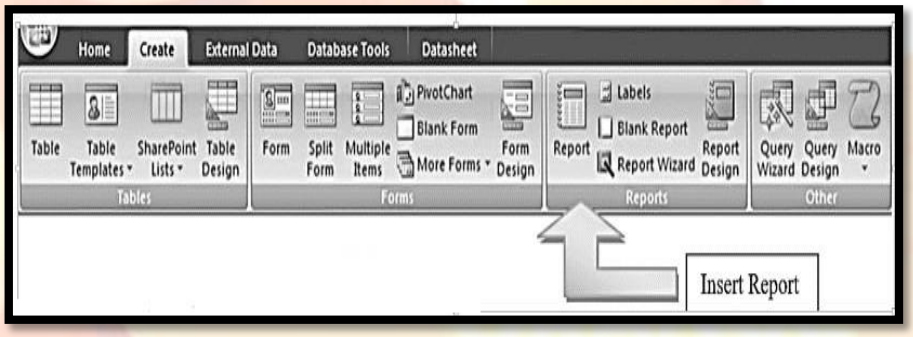


Figure 234: Insert Report

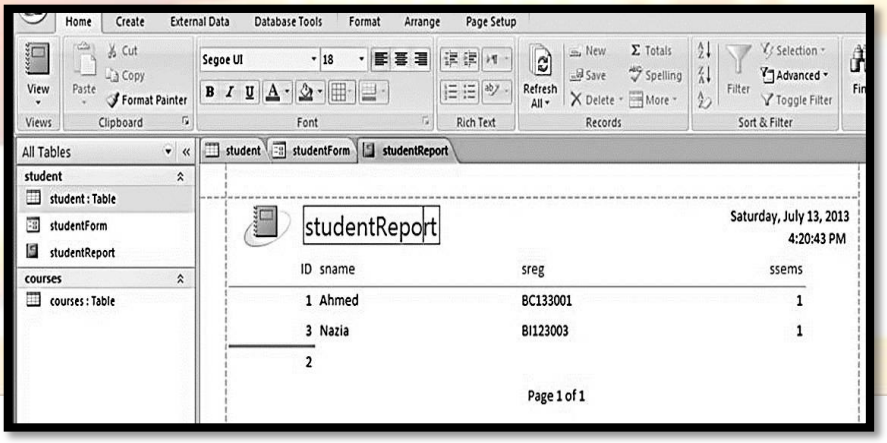


Figure 235: Student Table Report

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Module 229

168. Database: MS Access (Query Wizard)

Queries are to retrieve or fetch specific data from your database. The query wizard group has been shown in the Figure 236.



Figure 236: Query Group: Query Wizard

Query Types

There are four basic types of queries used to manipulate the databases. These are briefly described in the Table 1 along with generic syntax.

Table 1: Basic Queries

Query	Description	Generic SQL Syntax
Select	Used to retrieve selected data one or more field can be selected by using comma as seperator or use * to select all table fields, followed by table name from where the data is to be retrieved. You can also add WHERE clause to set criteria for selection.	SELECT field1,field2…,fieldN FROM table_name1,table_name2; OR SELECT * FROM table_name, table_name2; OR SELECT *FROM table_name, table_name2 WHERE some criteria;
Insert	Used to add new records.	INSERT INTO table_name (field1, field2,...fieldN) VALUES
Update	Used to update existing records in database. Given some criteria in WHERE clause.	UPDATE table_name SET field1=newvalue1, field2=newvalue2
Delete	Used to remove data from database.	DELETE FROM table_name WHERE some criteria;

Query Student Table using Wizard

1. Click Create tab. From the Query group select Query Wizard (Figure 236).
2. From popup window select simple query and click OK.

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3. Another window will appear. Select table from which you want to query results in our case it is the student table.
4. Select sname and ssems from the displayed fields as shown in Figure 237
5. When done click next and next again.
6. Before you click finish entering the name you want to give your query. For example, "StudentTBQuery1". Click finish.
7. Your query will be represented in a table form with two selected fields student name and semester.
8. Save query as you saved your report and form (Figure 238).

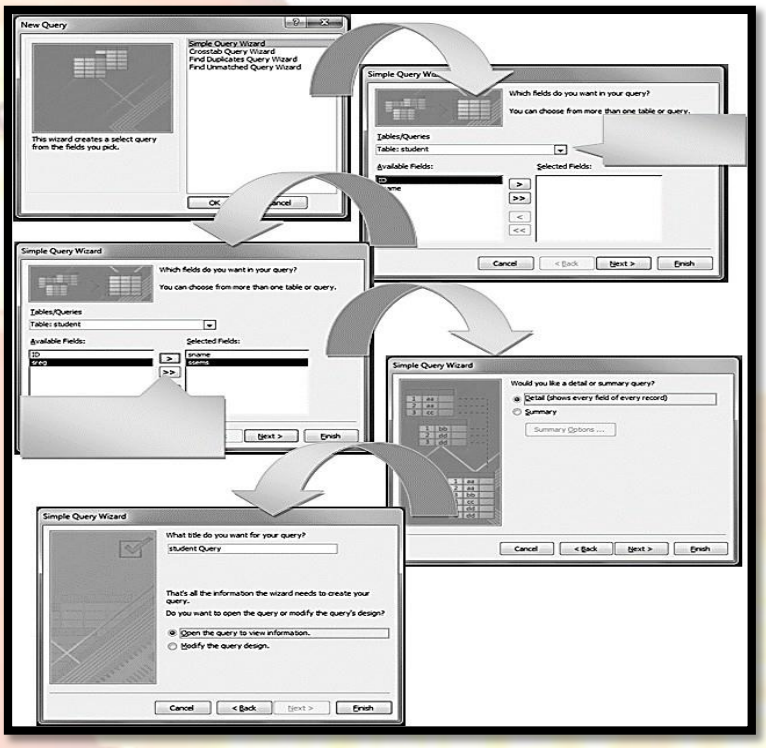


Figure 237: Creating Query using wizard

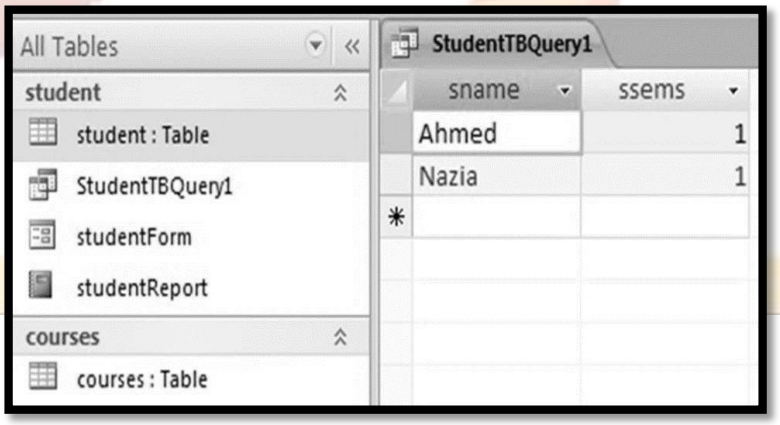


Figure 238: Query Result after saving

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SQL stands for Structured Query Language. This is the most commonly used syntax for querying a relational database. Microsoft Access Provides SQL View feature to view the SQL Syntax of the Query generated. To view the SQL Syntax of your Query right click on query tab and Select SQL View as shown in the Figure 239.

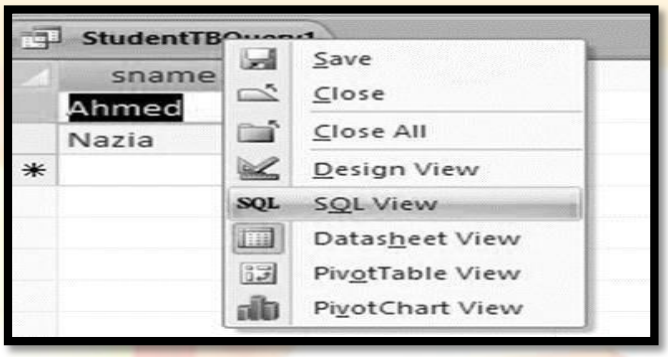


Figure 239: SQL View

Query Design View

Query design view (see Figure 240) can be used to design or create a query with addition of further parameters such as Where Clause, Sort or Order By clause and other useful features.

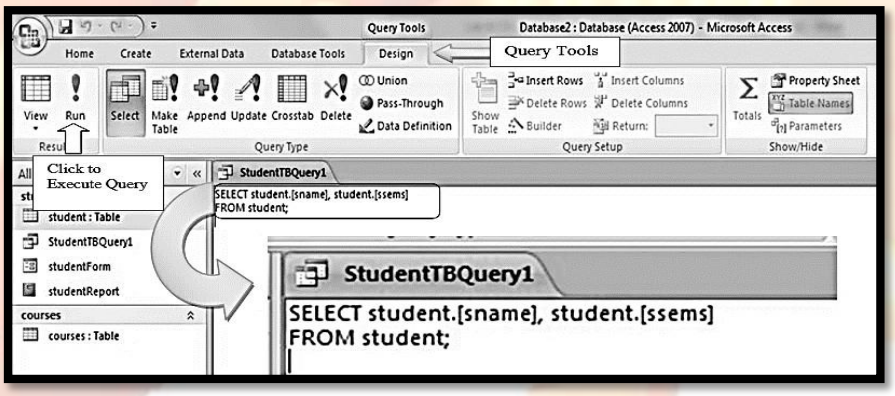


Figure 240: SQL View Query Syntax

Exercise: Query Student Table

1. Click Create tab. From the Query group select Query Design (Figure 241).
2. From popup window select table name.
3. You can add multiple tables to perform query as well for simplicity we will use one table, click Add and then close.
4. Table with is all fields will be shown in a small box.
5. From the options shown at the bottom. Click on text box and from drop down menu select field name “sname” it’s table ”student” in first column.(Figure 242)
6. Select field name “ssems” it’s table ”student” in second column.

Let’s say we want to view records of only those students who are in 3rd semester. Here our criteria is “3rd semester”

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7. In the criteria box of the field ssems type 3.
8. Repeat step 5 to select remaining fields of the table.
9. When happy with the selection click Run on the top left corner of the Query Tools (Figure 240).



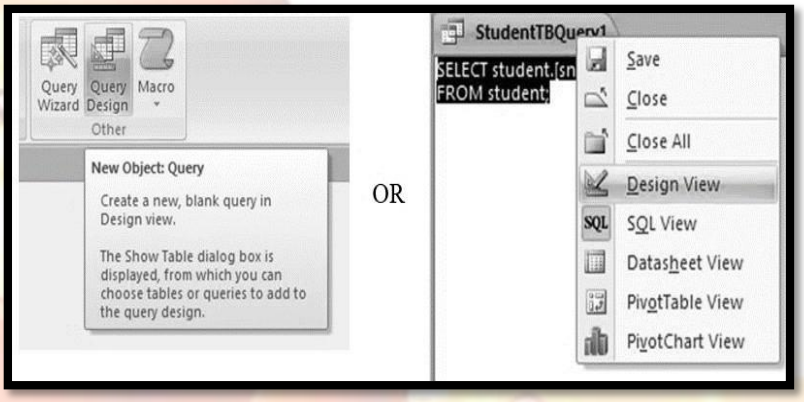


Figure 241: Query Design View

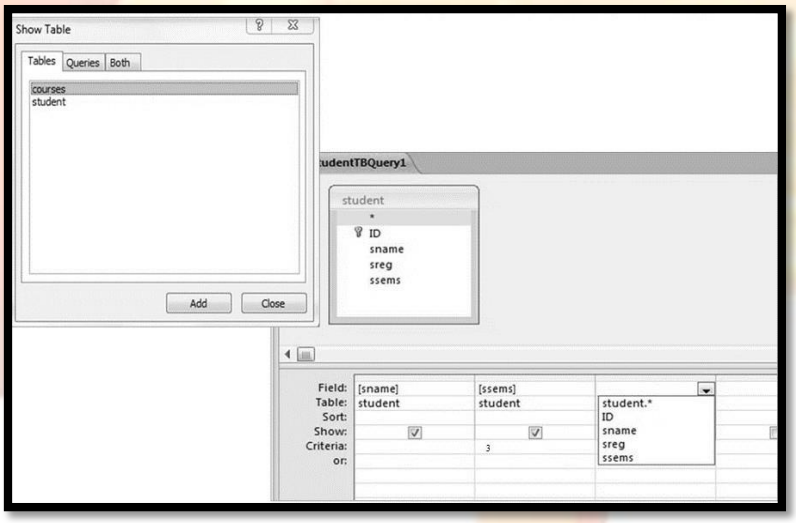


Figure 242: Create Query Using Design View

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Module 230

169. Web page Development (Notepad Editor)

In this module, you will learn what is web page, how it can be developed using notepad editor.

What is a Webpage?

A web page is nothing more than a file, a HTML file to be exact. It's called HTML because web page documents have the file extension **.html** or **.htm.** A web browser displays a web page on a monitor or mobile device. We can use WebPages to display information to a large audience. WebPages provides an opportunity to market your business at a larger scale and let the world know your existence.

HyperText Markup Language is a markup language that web browsers use to interpret and compose text, images and other material into visual or audible web pages. Default characteristics for every item of HTML markup are defined in the browser. The purpose of a web browser is to read HTML documents and compose them into visible or audible web pages. Whenever you open a HTML document in a web browser, the web browser does not display the HTML tags, but uses the tags to interpret the content of the page.

HTML elements form the building blocks of all websites. HTML allows images and objects to be embedded and can be used to create interactive forms. It provides a means to create structured documents by denoting structural semantics for text such as headings, paragraphs, lists, links, quotes and other items. It can embed scripts written in languages such as JavaScript which affect the behavior of HTML web pages.

1.1 HTML Elements:

An HTML element has a starting and ending tag. Content is placed between start and end tag. Elements can have various attributes.

1. The text between tags <html> and </html> describes the start and end of web page.
2. The text between tags <body> and </body> represents the content of the page that is visible to the end user.
3. The text between tags <h1> and </h1> is presented as a first heading.
4. The text between tags and is presented of the page as one paragraph. Each tag has a stating tag and an ending tag. Some exceptions are there which will be discussed later.

An element can have multiple elements in it before end tag.

BLOCK elements always start after a new line and the content is displayed in the next line in browser.

Examples: <h1>, , <ul>, <table>(will be used in coming sections)

Inline elements are usually displayed on the browser without starting a new line. Examples: <b>, <td>, <a>, <img>

HTML Attributes

Elements have attributes that provides additional information about that element. Attributes are certain name that comes in between starting and ending tags.

Example:

<img src="VU logo.jpg" width="100" height="150">

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img is element. src, width and height are attributes for image tag. src defines the location of the element. Width and height represent sizes of the image.

Using Notepad to develop HTML page

1. Open any text editor for example notepad
2. Write the code shown in the Figure 243.

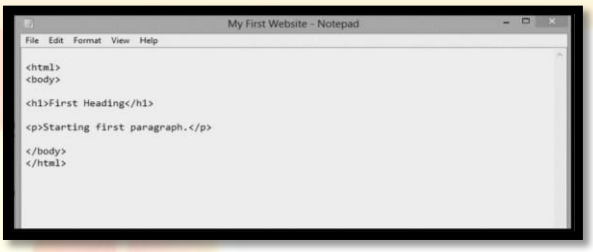


Figure 243: HTML code in Notepad

3. Now save the document as html illustrated in the Figure 244.

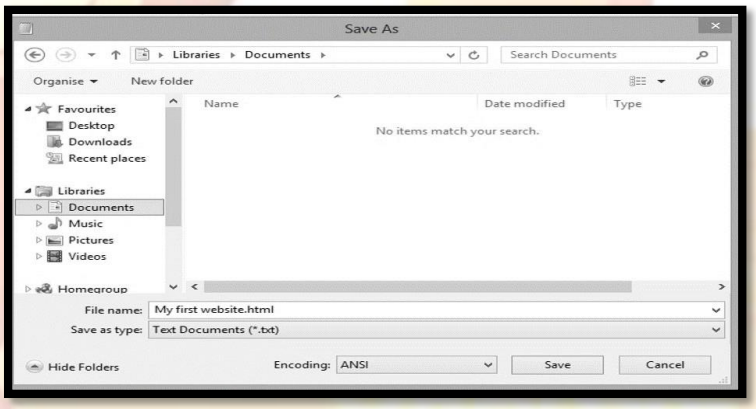


Figure 244: Saving as html page

Double click on that html file and open with any of installed browsers. The icon will appear as shown in the Figure 245.



Figure 245: First web page output

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Module 231

170. Web page Development (Introduction to Dreamweaver)

Although the HTML markup of a web page can be written with any text editor such as Notepad as we have written in the last module. However, when we are making large webpages with many different tags, in that case, the code becomes complex. To cope with such situation, specialized HTML editors are used.

HTML editor is a software application for creating web pages, specialized HTML editors can offer convenience and added functionality. For example, many HTML editors work not only with HTML, but also with related technologies such as CSS (Cascading Style Sheets), XML(Extensible Markup Language) and JavaScript. Anyone who wants to make professional web pages, he has to use these technologies. Almost all pages that you see now a days on the Internet consist of (fully or partially) components that are made from CSS,XML and JavaScript.

In this module we will be introducing a toll known as Adobe Dreamweaver that makes it easier for web page developers to utilize the technologies like CSS and JavaScript. We will not be making complex web pages in this lab however; we will be going through a basic introduction of Adobe Dreamweaver. Although there are several other HTML editing tools available, we have chosen this tool because it is among the most commonly used tool for professional web development.

Adobe Dreamweaver is a web design and development application that provides a visual WYSIWYG editor (What You See Is What You Get) and a code editor with standard features such as syntax highlighting, code completion, and code collapsing as well as more sophisticated features such as real-time syntax checking and code introspection for generating code hints to assist the user in writing code.

Dreamweaver is a powerful application for developing websites and mobile applications. You can save time, work more efficiently, and create compelling designs with the complete set of tools. It is leading software for developing websites and mobile applications. Using its powerful HTML coding environment and standard-setting visual interface, you can create engaging and dynamic websites for a wide range of devices, whatever your level of design or development experience.

The common misconception with Dreamweaver is that Dreamweaver is designed to or is even capable of completely removing the text editors like Notepad for HTML and CSS coding from web design. This is like saying that a machine-made football can completely replace a man-made football A machine made football can make good quantity of footballs in a commercial production however, it cannot achieve the durability and perfection of a man made football. As you may know, man-made footballs from Sialkot are still being used in international tournament s even though we have the choice of machine-made footballs.

Dreamweaver, like the machine that makes football, is designed to make your life easier. You may never learn HTML or CSS, but without knowing them, you are limited to Dreamweaver's way of doing things. This is not altogether a bad thing: it is simply a slightly narrow perspective on a large field. Dreamweaver is not designed to completely remove the utility of HTML and CSS: it is meant to assist you with your HTML and CSS and to make some of the more mundane aspects of Web Publishing less terrible.

Dreamweaver interface has been shown in the Figure 246.

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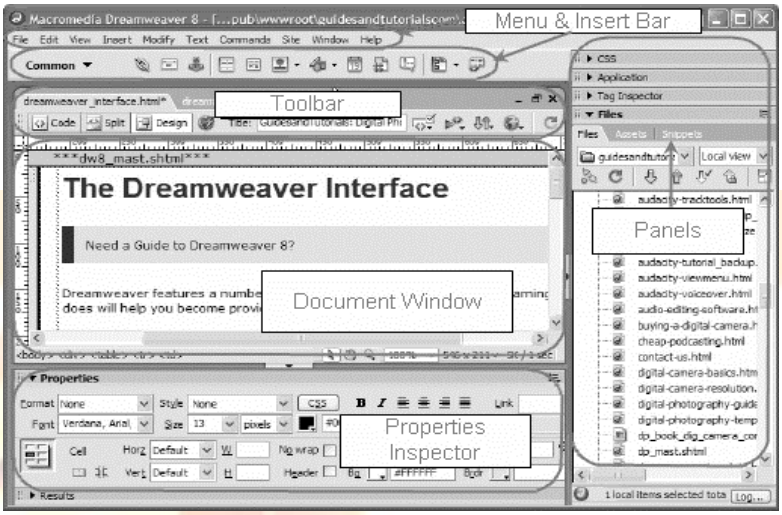


Figure 246: Dreamweaver interface

The Document toolbar: Contains buttons that provide options for different views of the Document window (such as Design view and Code view), various viewing options, and some common operations such as previewing in a browser.

The Menu and Insert bar: Across the top of the application window contains a workspace switcher, menus and other application controls. To display the Standard toolbar, select View

> Toolbars > Standard. The toolbar contains buttons for common operations from the File and Edit menus very similar to MS Word: New, Open, Browse in Bridge, Save, Save All, Print Code, Cut, Copy, Paste, Undo, and Redo.

The Document window: Displays the current document as you create and edit it. To switch to a document, click its tab. The Document Window is the main workspace where you insert and arrange the elements on your web page. Most of your work inserting text and images on your web page is done in the Document Window.

You can select any of the views. Description of the important views is given below.

Design view: A design environment for visual page layout, visual editing, and rapid application development. In this view, Dreamweaver displays a fully editable, visual representation of the document, similar to what you would see when viewing the page in a browser.

Code view: A hand-coding environment for writing and editing HTML, JavaScript,

Split Code view: A split version of Code view that lets you scroll to work on different sections of the document at the same time.

Code and Design view: Lets you see both Code view and Design view for the same document in a single window.

Live view: Similar to Design view, Live view displays a more realistic representation of what your document will look like in a browser, and lets you interact with the document exactly as you would in a browser. Live view is not editable. However, you can edit in Code view and refresh Live view to see your changes.

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Live Code view: Only available when viewing a document in Live view. Live Code view displays the actual code that a browser uses to execute the page, and can dynamically change as you interact with the page in live view. Live Code view is not editable.

Properties Inspector as shown in the Figure 247 also called the Tag Inspector. The Property Inspector is used to display and edit attributes or properties of any element that is selected in the Document Window. Click the Property Inspector's Hide button to hide the panel temporarily.

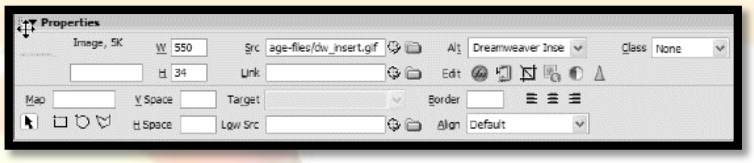


Figure 247: Properties panel

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Module 232

171. Web page Development (Inserting Tables using Dreamweaver)

First save the document that you got after clicking new HTML document in the welcome screen as shown in the Figure 248.

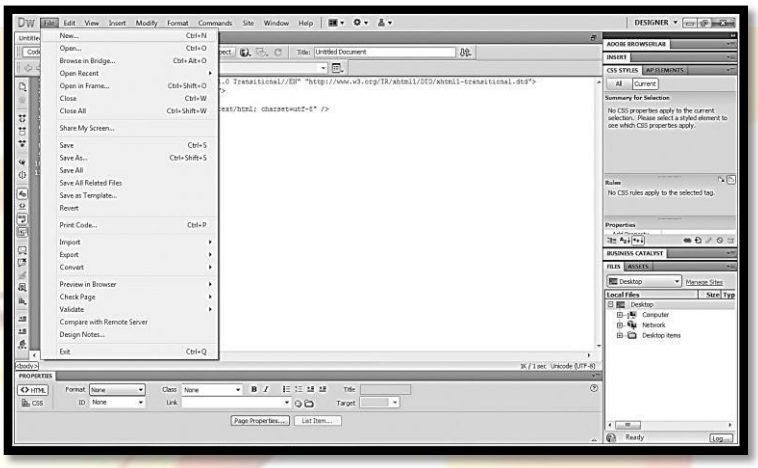


Figure 248: Add new page

Now add HTML page as shown in the Figure 249.

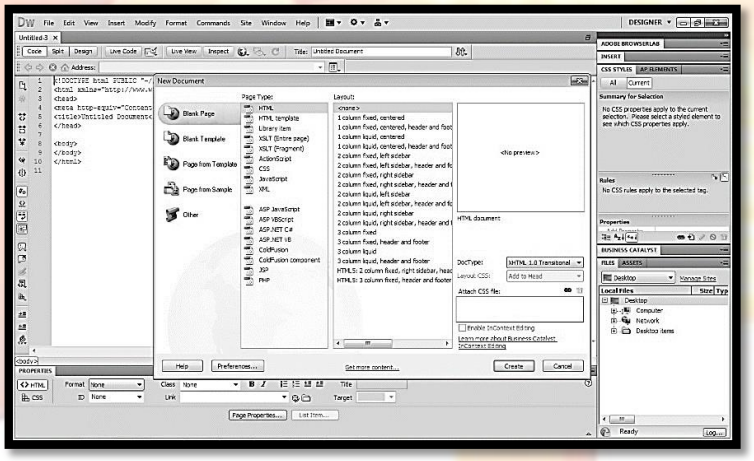


Figure 249: Adding HTML page

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Now give a name to the page as shown in the Figure 250.

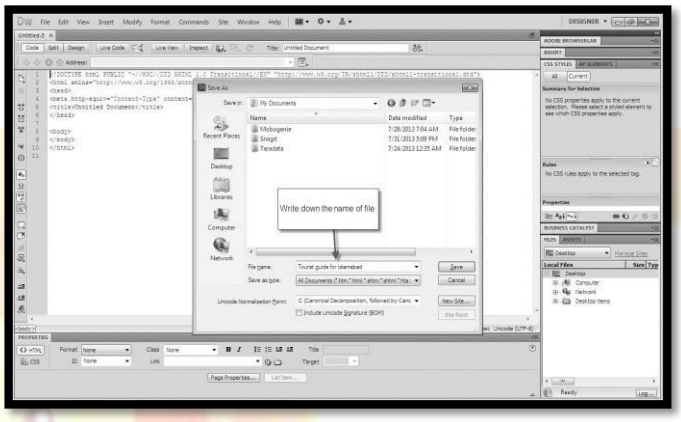


Figure 250: Naming the page

To insert table, just go to the Insert tab and add the table as shown in the Figure 251.

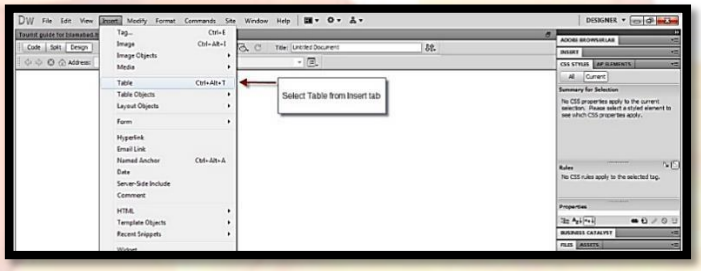


Figure 251: Insert Table

You can then specify number of rows and columns as shown in the Figure 252.

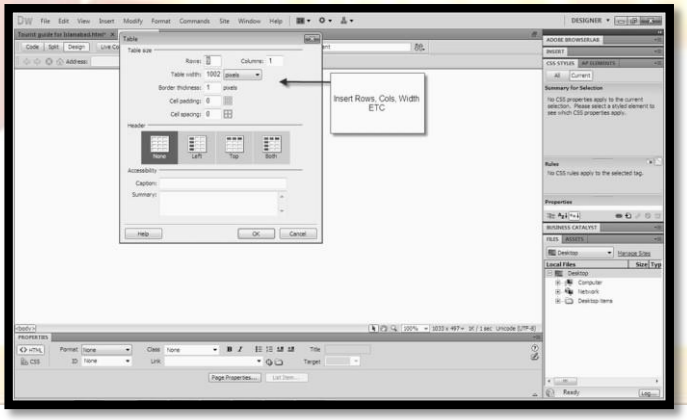


Figure 252: Rows and columns

You can then adjust the size of the rows as shown in the Figure 253.

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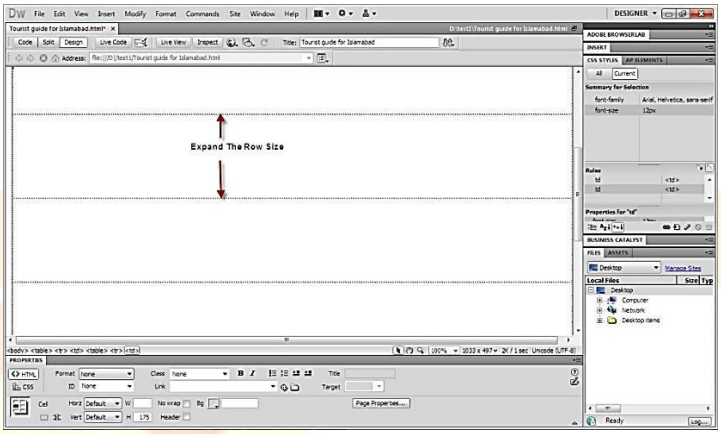


Figure 253: Adjusting row sizes

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Module 233

172. Web page Development (Inserting Lists)

Bulleted lists might be familiar to you if you have worked with word processing or desktop publishing applications. Lists are a helpful way to present information to a reader without the formal constraints of a paragraph. They are especially important on the Web. Studies indicate that people typically skim web pages instead of reading them from beginning to end. Creating lists will make it easier for your visitors to get the most from your website without sifting through several paragraphs of text.

On the events.html page, click and drag to highlight the text which you want to put in the list.

Make sure you have the HTML button selected in the Property Inspector at the bottom of your page, and click the Unordered List button as shown in the Figure 254. The highlighted text becomes indented, and a bullet point is placed at the beginning of each line.

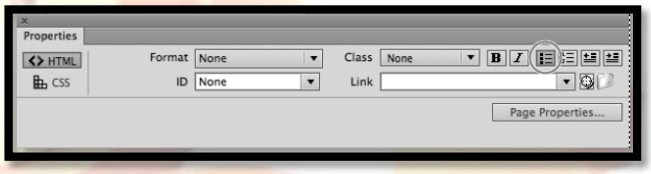


Figure 254: Adding unordered list

Use the Unordered List button in the Property Inspector to create a bulleted list.

Click the Ordered List button to the right of the Unordered List button. The bullets change to sequential numbers.

Choose Format > List > Properties to open the List Properties dialog box. Choose Bulleted List from the List type drop-down menu to return to your first style of list. The Numbered List and Bulleted List options in the List type drop-down menu also allow you to switch between ordered and unordered lists.

From the Style drop-down menu (see Figure 255), choose Square. This changes the default circular bullets to square bullets. Click OK to exit the List Properties dialog box.

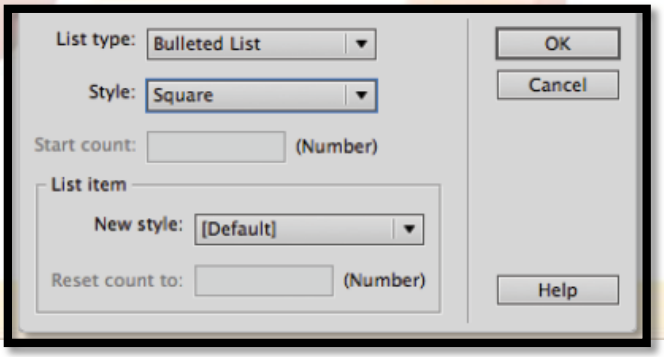


Figure 255: List of properties

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Module 234

173. Web page Development (Inserting Images)

Adding image is very easy using Dreamweaver.

Go to Insert tab and press Image button as shown in the Figure 256.

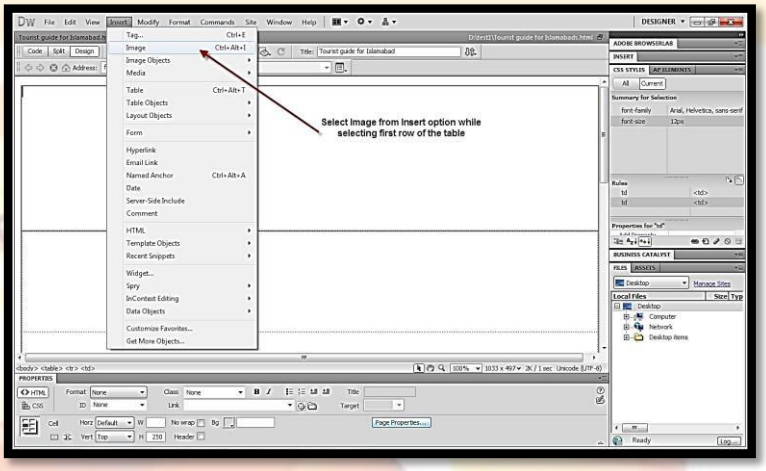


Figure 256: Inserting Image

Then you will be given the option to select the impage from your drive as shown in the Figure 257. You can select the required image and it will be added to your webpage wherever you had placed the cursor.

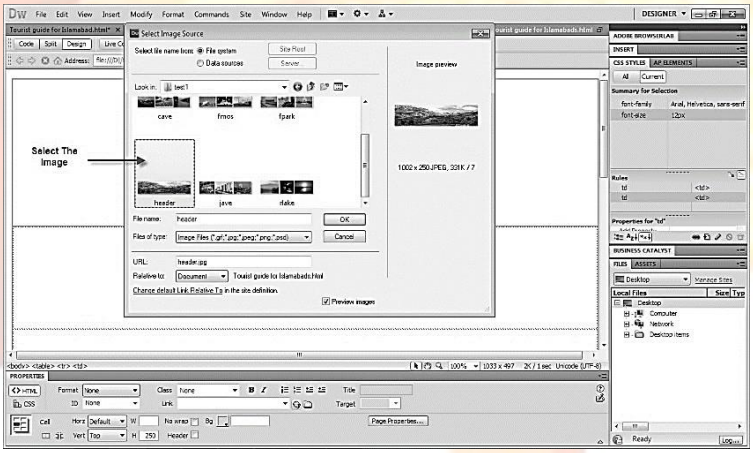


Figure 257: Browse Image

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