Computer Files

<u>Definition of some Terms</u>

1. Computer file is defined as the smallest meaningful unit of data representation within a computer

2. A computer file is a block of arbitrary information, or resource for storing information, which is available to a computer program and usually on some kind of durable storage.

File Functions:

Files are used to do one or more of the following functions:

a. Provide machine executable code

b. Store application program or operating system configuration

c. Store data used by user such as Microsoft Word files.

    Therefore there are three types of information that files contain:

i. Executable code

ii. system or program configuration file

iii.   user data

3. Record: A record is a collection of fields. In computer science, a record (also called struct or compound data) is a basic data structure.

4. Field: Field is a single piece of information about and object. A is also defined as a space that holds specific parts of data from a set or a record. Examples of fields are NAME, ADDRESS, QUANTITY, AGE, etc.

5. Data element: A data element is the logical definition of field

6. Data item: Data item is the actual data stored in the field

Types of Data Items

Each data element consist only a single item. These items will have one of the three basic types: numeric, alphabetic and alpha-numeric.

Numeric data: Data consisting of digits and not letters of the alphabet or special characters.

Alphabetic data: Data consisting of letters and not digits or special characters.

Alpha-Numeric data: Data consisting of digits, alphabets as well as special characters.

File Organization

The term *"file organization"* refers to the way in which data are stored in a file and, consequently, the method(s) by which it can be accessed.

File organization Terms

a. Block: A block is the physical unit of transfer between the backing store and the main memory.

b. Bucket: A bucket is the logical unit of transfer between the backing store and main memory.

c. Hit: In processing a record that is required is called a hit.

File Organization Structure

Types of File Organization

There are mainly four types of file organization:

1. Serial file organization

2. Sequential file organization

3. Index file organization

4. Random file organization

Serial file organization

Serial files are stored in chronological order, that is as each record is received it is stored in the next available storage position. In general it is only used on a serial medium such as magnetic tape.

Sequential file organization

Sequential files are files whose records are sorted and stored in an ascending or descending on a particular key field.

Index file organization

An index is an alphabetical list of names, subjects, etc., with references to the places where they occur. Indexed Sequential file organization is logically the same as sequential organization, but an index is built indicating the block containing the record with a given value for the Key field.

Random file organization

A randomly organized file contains records arranged physically without regard to the sequence of the primary key. Records are loaded to disk by establishing a direct relationship between the Key of the record and its address on the file,

normally by use of a formula (or algorithm) that converts the primary Key to a physical disk address. This relationship is also used for retrieval.

Methods for Accessing Files

Files can be accessed:

a. Serially

b. Sequentially and

c. Randomly

File Classification

Files are classified as follows;

a. **Transaction Files**: transaction files contains details of all transactions that have occurred in the last period. Examples of transaction files are price of the products, customers order for the products, inserting new data to the database etc.

Features of transaction file

1. The data stored in these files are temporary by nature

2. This file contains data only for period of time and send to the master file

3. Any data to be modified is done in this file

4. In this file the data to be modified is stored.

b. **Master Files**: Master file are permanent file kept up-to-date by applying the transactions that have occur during the operation of the business

Features of transaction file

1. The data stored in these files are permanent by nature

2. This file is empty while nature

3. This files are updated only through recent transactions

4. This file stores large amount of data

c. **Reference Files**: Reference file is a type of master file containing referential data. It contains data that are necessary to support data processing. e.g. price lists, dictionary files, present value schedules, amortization.

Criteria for File Classification

1. How the file is to be used

2. How many records are processed each time the file is updated

3. whether the individual records need to be quickly accessible

4. nature of content

5. Organization method

6. Storage medium

Handling Computer Files

<u>Basic File Operations</u>

Following are some of the basic file operations:

1. Create: To make a new file

2. Delete: To remove a file from disk

3. Retrieve: To find a file and bring it back

4. Copy: To produce file so that it is the same as the original piece of work

5. View: To see the files in a folder

6.   Update: A manipulation involving adding, modifying, or deleting data to bring a file up to-date

7. Open: Open a file for editing

8.   Close: To exit the edited file.

<u>Sequential File Creation</u>

There are many ways to organize data in a sequential file. One of such ways is by using BASIC Programming.

1.   Choose a DOS file name. A DOS file name is a string consisting of a base name of at most eight characters followed by an optional extension consisting of a period and at most three characters. Blank spaces are not allowed. Some examples of DOS file names are INCOME.86, CUSTOMER.DAT. And FORT500.

2.   Choose a number from 1 through 255 to be the reference number of the file. While the file is used, it will be identified by this number.

3. Execute the statement. OPEN file name FOR OUTPUT AS #n. Where n is the reference number.

4. Place data into the file with the WRITE statement.

5. After all the data have been recorded in the file, execute CLOSE #n

Example 1: A program to demonstrate the use of WRITE statement

REM Demonstrate use of WRITE statement

CLS

WRITE "ENIAC"

WRITE 1946

WRITE "ENIAC, 1946

LET a$ = "Eckert"

LET b$ = "Mauchly"

WRITE 14*139, "J.P. " , a$, b$, "John"

END

      [run]

ENIAC

1946

ENIAC 1946

1946, J.P. Eckert, Mauchly, John

Example 2: Write a program to create a file EXAMFILE.DAT with marks of English and Mathematics.

REM a program to create a file EXAMFILE.DAT and record data into it

OPEN "EXAMFILE.DAT" FOR OUTPUT AS #1

READ Maths$, Eng$

DO WHILE names$ <> "EOD"

WRITE #1, names$, Maths$, Eng$

READ names$, Maths$, Eng$

LOOP

CLOSE #1

DATA Joy,   87, 75

DATA Gbenda,   88, 67

DATA Viola   77, 70

DATA EOD,   0, 0

END

Accessing a Sequential File

Data stored in a sequential file can be read in order and assigned to variables with the following steps:

1. Choose a number from 1 to 255 to be the reference number for the file

2. Execute the statement. OPEN filename FOR INPUT AS n. where n is the reference number

3. Read data from the file with the INPUT statement.

4. After the desired items have been found close the file with the statement CLOSE #n.

Example: 3 write a program to display the contents of EXAMFILE.DAT

Solution

REM Read data from EXAMFILE.DAT file

OPEN "EXAMFILE.DAT" FOR INPUT AS #1

PRINT "Name", English", Mathematics"

DO WHILE NOT EOF (1)

REM process the entire file

INPUT name$, Maths$, Eng$

LOOP

CLOSE #1

END

File Insecurity

File security is a feature of a file system which controls which users can access which files, and places limitation on what users can do to it.

Effects of File Insecurity

The effects of file insecurity are:

1. Result to file loss

2. Data unreliable

3. Data corruption

File Security Methods

(i) Use of backups: This is refers to making copies of data so that these additional copies are used to restore the original after loss event. It is also a method of making copies of the file in a separate location so that they can be restored if

something happen to the computer. This can be done by using removable media such as rewritable CD, memory card, flash etc.

(ii) <u>The use of antivirus</u>. A virus is a self – replicating program that copies itself and that can infect other programs by modifying them or their environment such that a call to an infected program implies a call to a virus. An anti-virus is a software designed to detect and destroy computer viruses.

(iii) <u>The use of password:</u> A *password* is a string of characters used for authenticating a user on a *computer* system. It can prevent people accessing computer system, account files or parts of files by requiring a user to enter password.

(iv) <u>Proper label of storage device</u>: You should label your storage devices like floppies, CDs, DVDs, Pen drivers etc. So that you know what is exactly stored in them and so as not to accidentally delete of format them.

(v) <u>File management:</u> file management is the process of maintaining folders, documents and multimedia into categories and subcategories as desired by a user.

DIfferences Between Computer files and Manual Files

Computer File	Manual File

1. Computer files are transferred electronically.	Manual files can be transp means
2. Computer files are difficult to destroy and can last for a long time.	Manual files can warn off a hand.
3.Difficult to access at all times	Easy to access whenever re
4.Large amount of information can be stored and transferred	It is difficult to store hefty a manually.

Advantages of Computerized Files

(i) Computer can perform calculations quickly and efficiently.

(ii) Data can be retrieved quickly and easily.

(iii) Documents that are lost can often be retrieved.

(iv) Security is tight and hard to break into.

(v) Makes work easier.

(vi) Quicker to find things and sort things.

(vii) Transactions, accounts can be handled more properly by computers than manually.

Limitations of Computerised Files

(i) Computerized filing system is expensive to set up.

(ii) Not effective where there is irregular electric supply.

(iii) Skilled labor with proficiency in computers is required.

Word Processing

Definition of Terms

Word Processing: Word processing means using the computer to create, edit, and print document.

Word processor: A word processor is an electronic device or computer software application, which performs the task of composition, editing, formatting, and printing of documents.

Text Document: Text document is something written, printed, or online document that presents data in the form of an articles, letter, memorandum, report, etc.

Examples of word processor
There are many word processing software packages available today, such as WordStar, MS-word, Corel WordPerfect, WordPad, Notepad, WPS writer, etc

Application Areas of Word processing Software
i. Offices
ii. Publishing
iii. Journalism
iv. Education
v. Articles

Steps Involved in Loading Microsoft Word
There are many ways of loading Microsoft word:
a. If the icon of the package is on desktop, double click on it for it to open
b. If the icon is not on the desktop, follow the step below:
i. Click the Start Button
ii. Click on all program
iii. Select and click Microsoft office
iv. Select and click Microsoft Word

MS-Word processing environment
The word window is made up of many components that are displayed onscreen at the start of the program such as:
a. Title bar: The title bar is the top part of the window displaying MS Word. It displays the name of the active document.
b. Menu bar: The menu bar contains commands for word operation. E.g Home, Insert, view, insert, page layout, etc
c. Status bar: bottom of the window it displays the status of the document
d. Toolbar: Toolbar serves as short cuts for common commands such as save, print, new, open, undo, etc.
e. Work space: it is the area where actual word processing is done.

f. Formatting toolbar: This toolbar contains shortcut to the commands used for formatting text. You can change your word or line paragraph to bold, italic or underline,
Etc

Facilities Available in a Word Processor

a. Type document: the Keyboard is used to type a document. You type a document by pressing the relevant keys on the keyboard in order to arrive at the desired word.

b. Edit document: This is the ability to change text by adding, deleting and rearranging letters, words, sentences and paragraph.

c. Store document: Word processor gives the opportunity of accessing a previously saved file or document either on the computer or on external storage facility.

d. Move, copy and paste: A word, line or text, paragraph, page or diagram can be moved from one document to another. It could be also be within a document that for one line to the other. It can also be from one application packages to the other, e.g., from CorelDraw to Microsoft Word.

Word processor varies considerably, but all word processors support the following basic features:

Insert text: Allows you to insert text anywhere in the document

Delete text: Allows you to erase characters, words, lines, or passages.

Cut and paste: Allows you to remove a section of text from one place in a document and insert it somewhere else

Copy: Allows you to duplicate a section of text

Page size and Margins: allows you to define various page size and margins.

Search and replace: Allows you to search for a particular word or phrase and also replace one group of characters with another everywhere that first group appears.

Word wrap: The word processor automatically moves to the next line when you have filled one line with text.

Headers, footers, and page numbering: Allows you to specify customized headers and footers the word process will display at the top and bottom of every page

Font Specification: Allows you to change font attributes within a document.

Spell Checker: A utility that allows you to check the spelling of words. It will highlight any word that it does not recognize

Thesaurus: Allows you to search for synonyms without leaving the word processor

WYSIWYG (what you see is what you get): With WYSIWYG, a document appears the display screen exactly as it will look when printed. ETC

Spreadsheets

Definition of Spreadsheet

1. A Spread sheet application is a large sheet having data and information arranged in rows and columns

2. Spreadsheet is application software that tracks, analyzes, and charts numeric information.
3. A spreadsheet is an interactive computer application program for organization, analysis and storage of data in tabular form
4. Spreadsheet is a computer program or software which allows calculation to be carried out on several cells that have numbers

Example of Spreadsheet
1. iWork Numbers – Apple Office Suite
2. Lotus 1-2-3
3. OpenOffice – Calc
4. Lotus Symphony – Spreadsheets
5. Microsoft Excel
6. VisiCalc

Application Areas of Spreadsheet
1. Accounting.
2. Statistical calculations.
3. Preparation of student results.
4. Obtaining tax estimation
5. Preparation of daily sales

Spreadsheet Terms and Features

1. Absolute Cell Reference: An absolute cell reference is one that does not change when it is copied. To make a cell reference absolute, you must include a $ before the reference (e,g C4).

2. Active Cell: The active cell is the cell in the spreadsheet that is currently selected for data entry. The active cell reference is listed in the Name Box directly above the spreadsheet's column headings.

3. Anchor Cell: The anchor cell is the first cell that is highlighted in a range. When a range of cells is selected, they appear as highlighted in black. The anchor

cell, however, remains white. If only one cell is selected in the sheet, it is the anchor cell.

4. Cell: A cell is a rectangular area formed by the intersection of a column and a row. Cells are identified by the Cell Name (or Reference, which is found by combining the Column Letter with the Row Number. For example the cell in Column "C" in Row "3" would be cell C3. Cells may contain Labels, Numbers, Formulas or Functions.

5. Cell Reference: A cell reference is the name of the cell that is found by combining the Column Letter with the Row Number. For example the cell in Column "C" in Row "3" would be cell C3.

6. Column: Columns run vertically on the spreadsheet screen. An Excel spreadsheet are labeled with the letters of the alphabet. When the column labels reach letter "Z" they continue on with AA, AB, AC...... AZ and then BA, BB, BC.....BZ etc.

7. Data: Data refers to the type of information that can be stored in the cells of a spreadsheet. Spreadsheet data types include values (numbers), labels, formulas and functions.

8. Formula: A formula is a spreadsheet data type that will calculate a result and display it in the active cell. A formula is written using cell references and must begin with an equal sign "=" to distinguish it from a label. An example of a formula would be:
=A3+C3 which would take whatever value was entered into cell A3 and add it to the value that was typed into C3. After typing the formula and pressing the Enter key, the resulting value will be displayed.

9. Formula Bar: The formula bar appears directly above the column headings of a spreadsheet and will display what has been typed into the active cell. For example, if you click on a cell that contains the formula =A3+C3, the cell itself will show the result of the formula. The formula bar, however, will display what has actually been typed into the cell which, in this case, is =A3+C3.

10. Function: Functions are built-in formulas that are used to enter either commonly used or very complex formulas. Like formulas, functions begin with an equal sign "=" and use cell references in their format. One commonly used function is the Sum function, which will add up the values in a range. The function: =sum(H2:H25) would add all values contained in cells H2 through H25 and return the result when the enter key is pressed.

11. Gridlines: Gridlines are the horizontal and vertical lines on the screen that separate cells in a spreadsheet. Gridlines typically do not print unless the option is set in the layout options of the spreadsheet.

12. Labels: Labels refer to text that is typed into the cells of a spreadsheet. Labels have no numeric value and cannot be used in a formula or function.

13. Name Box: The name box appears to the left of the formula bar and displays the name of the current cell. Unless you define a cell or range of cells with a specific name, the name box will display the cell reference of the active cell.

14. Print Area: The print area is used to specify a range of cells that will be printed, rather than printing an entire worksheet. This is particularly useful for very large worksheets with multiple columns and rows.

15. Range: A range is a group of cells in a spreadsheet that have been selected. If the cells are all together in a rectangular or square shape, it is an adjacent range. An adjacent range is identified by the cell reference in the upper left and lower right corners of the selection separated by a colon. (Example: A3:B5). In this example, the range would include all cells in the rectangular area formed by beginning the highlighting in cell A3 and dragging down to B5. You can consider the colon as the word "through". In this case, the range would include cells A3 through B5.

16. Relative Reference: A relative cell reference is one that changes when it is copied. For example, if a formula that contains the cell reference "C4" is copied to the next cell to the right, the reference will change to D4 (updating the column letter). If the same formula is copied down one cell, the reference will change to "C5" (updating the row number). The other type of reference is an Absolute Reference.

17. Rows: Rows run horizontally on the spreadsheet screen.

18. Sheet Tabs: In Microsoft Excel, the sheet tabs appear below the worksheet grid area and allow you to switch from one worksheet to another in a workbook.

19. Values: Values are numeric data that is entered into a cell. When data is formatted as the value type, it can be referred to in formulas and functions and used in calculations.

20. Workbook: A workbook is a collection of worksheets that are saved together in one file. Individual worksheets can be given descriptive names and you can switch from one worksheet to another by using the sheet tabs that appear beneath the worksheet grid area.

21. Worksheet: A worksheet is the grid of columns and rows that information is inputted into. In many spreadsheet applications (such as Microsoft Excel) one file -- called a workbook -- can contain several worksheets. Worksheets can be named using the sheet tabs of the bottom of the spreadsheet window. The sheet tabs can also be used to switch from one worksheet to another within a workbook.

Basic Operations in Worksheet

1. Starting Worksheet

To start a worksheet, the MS Excel will be loaded first to the screen of the computer. A workbook will be displayed automatically as the default file name book1

2. Data entry
This is the process of inputting data into the cells of the worksheet. There are three basic types of data in spreadsheet packages and they are:

a. Values or Numbers
b. Formula
c. Labels

3. Editing Worksheet
This is the process of customizing the worksheet so that it could ne neatly arranged on the pages when printing. Check spelling, preview layout, page setup and sheet setting, etc are parts of the editing process. The editing process gives the worksheet a befitting look.

4. Saving
This can easily be done using the Save As found on the file menu or by pressing ctrl + S keys simultaneously. A dialog box appears on your screen asking for the file name to be used and the location to save into.

5. Retrieving or Opening Worksheet
To retrieve or open a worksheet, click on office button on the menu and click on Open button form the file sub-menu or by pressing Ctrl + O keys together. A dialog box will be displayed asking you to choose the worksheet to be opened or retrieve.

Formatting Worksheet
a. Changing column width
i. Pull down the Format Menu and select Column and then width
ii. Type the desired width in the space provided

b. Changing Row Height

i. Pull down the Format Menu and select Column and then width
ii. Type the desired height in the space provided

Adding Formulae and Performing Calculations

To tell the spreadsheet package that you will be entering a formula, you must start the formula with a particular symbol. Excel uses the sign = and lotus 1-2-3, uses the @, - or + signs.

The operators used in spreadsheet formulae include

Addition +
Subtraction -
Multiplication *
Division /
Exponentiation ^

Using Functions in Microsoft Excel

Sum Function
The sum function adds up the total values of a group of cells, depending on which cells you choose. The general form is:
=SUM(First cell:Last cell)

Average Function
This will compute the average of the values of a group of cells depending on which cells you choose. The general form is:
=AVERAGE(First cell:Last cell)

Count Function
This function will count the number of entries in the range from first cell to last cells you choose. The general form is:
=COUNT(First cell:Last cell)

Max Function
The max function is used to find the largest value in a set of values in the row or column. The general form is:
=MAX(First cell:Last cell)

Min Function
The Min function is used to find the smallest value in a set of values in a row or column. The general form is:
=MIN(First cell:Last cell)

Printing Worksheet

Printing a worksheet is not much different from printing a word processing document. To Print a Worksheet Click on office button, select print from the menu or by pressing ctrl + P keys simultaneously.

Creating Graphs

MS Excel gives options of creating charts from data entries in your spreadsheets. Charts like line graph, histogram, pie charts and bar charts could be created from the supplied data basically numeric data.

There are different parts of chart namely:

a. Legend: In a chart or graph in spreadsheet programs such as Excel, the legend is most often located on the right hand side of the chart or graph and can sometimes be surrounded by a border. The legend is linked to the data being graphically displayed in the plot area of the chart

b. Axis: As in normal mathematical operations every chart must carry axis i.e. axis X and Y, where X and Y stands for horizontal and vertical lines respectively which are displayed on data scale

c. Data series: These are set of numbers in either row or column.

All charts are created in the same way by selecting range of cells within a worksheet called chart range after which one selects chart wizard option.

Central Processing Unit

<u>Brief history of the CPU</u>

The fourth generation computers started with the invention of Microprocessor. The Microprocessor contains thousands of ICs. **Ted Hoff** produced the first microprocessor in 1971 for **Intel**

<u>Definition of the CPU</u>

The Central Processing Unit (CPU) also known as the microchip or the microprocessor (or processor for short) is the electronic circuitry within a computer that carries out the instructions of a computer program. This is the brain or heart of the computer. The main objective of the CPU is to perform mathematical calculations on binary numbers. Most modern CPUs are microprocessors, meaning they are contained on a single integrated circuit (IC) chip. Some computers employ a multi-core processor, which is a single chip containing two or more CPUs called "cores".

<u>Components of the Central Processing Unit</u>

The central processing unit consists of two parts:

1. Control Units (CU)
2. Arithmetic Logic Unit (ALU)

<u>The Control Unit</u>: The control unit of the CPU contains circuitry that uses electrical signals to direct the entire computer system to carry out, or execute, stored program instructions. Like and orchestra leader, the control unit does not execute program instructions; rather, it directs other parts of the system to do so. The control unit must communicate with both the arithmetic/logic unit and memory.

Functions of the control unit

The control Unit:

i.   activates the appropriate circuits necessary for inputs and output devices.

ii. causes the entire computer system to operate in an automatic manner.

iii.   directs the system to execute instructions.

iv.   helps in communication between the memory and the arithmetic logical unit.

v.   aids in the loading of data and instructions residing in the secondary memory to the main memory as required.

The Arithmetic/Logic unit (ALU): The arithmetic/Logic unit contains the electronic circuitry that executes all arithmetic and logical operations. It is also defined as part of the CPU that carries out arithmetic and logic operations on operands in computer instruction.

Functions of the ALU units

i.   The arithmetic and logic unit executes arithmetic and logical operation. Arithmetic operations include addition, subtraction, multiplication and division.

Logical operations compare numbers, letters and special characters.

ii. Compares operation test for three conditions:

a.   Equal to condition in which two values are the same,

b. Less than condition in which one value is smaller than the other,

c.   Greater-than condition which one value is larger than the other.

Memory Unit

Definition of Memory

Memory unit is that part of the computer that holds data for processing. It may also be defined as the storage space in computer where data to be processed and

instructions required for processing are stored. Although closely associated with the central processing unit, memory is separated from it.

Types of Memory

Memory is of two types:

1. Primary memory/main memory/internal memory
2. Secondary memory/auxiliary memory/external memory

Primary Memory: Primary memory is the memory that can be directly accessed by the CPU, the CPU constantly interact with it, reads instructions stored there and executes them as required.

Types of Primary memory

There are basically two types of primary memory:

a. RAM

b. ROM

RAM (Radom Access Memory):

Random access memory, also called the Read/Write memory, is the temporary memory of a computer. It is said to be 'volatile' since its contents are accessible only as long as the computer is on. The contents of RAM are cleared once the computer is turned off or if there is a power cut.

Types of RAM

i. Dynamic RAM: Dynamic RAM (DRAM) is a type of physical memory used in most personal computers. The term **dynamic** indicates that the memory must be constantly refreshed (reenergized) or it will lose its contents.

ii.   Static RAM: Static RAM (SRAM) is a type of RAM that holds its data without external refresh, for as long as power is supplied to the circuit. This is contrasted to dynamic RAM (DRAM), which must be refreshed many times per second in order to hold its data contents

ROM (Read Only Memory)

Read Only Memory is a special type of memory which can only be read and contents of which are not lost even when the computer is switched off or if there is a power cut. It typically contains manufacturer's instructions.

ROM is mainly of three types

i.   Programmable Read-Only Memory (PROM): This type of ROM can be re-programmed by using a special device called a PROM programmer. Generally, a PROM can only be changed/updated once.

ii.   Erasable Programmable Read-Only Memory (EPROM): This type of ROM can have its contents erased by ultraviolet light and then reprogrammed by an RPROM programmer. This procedure can be carried out many times; however, the constant erasing and rewriting will eventually render the chip useless.

iii. Electrically Erasable Programmable Read-Only Memory (EEPROM): These are also erasable like EPROM, but the same work of erasing is performed with electric current. Thus, it provides the ease of erasing it even if the memory is positioned in the computer. It stores computer system's BIOS. Unlike EPROM, the entire chip does not have to be erased for changing some portion

of it. Thus, it even gets rid of some biggest challenges faced by using EPROMs.

Differences between RAM and ROM

S/N	RAM	ROM
	It is volatile (It loses data when power is turned off)	It is non-volatile (retains data even when power is off**)**
2.	RAM is fast	ROM memory is extremely fast compared to RAM
	Data in RAM can be changed or deleted	ROM is fixed or data cannot be modified.
	RAM chip are bigger in size	ROM chip are smaller in size
	RAM chips are relatively expensive	ROM chips are relatively less expensive
	RAM stores all the applications and data when the computer is running	ROM usually stores instructions that are required to for booting the computer

Secondary Memory

This type of memory is a non-volatile memory. It is slower than main memory. These are used for storing data/Information permanently. CPU directly does not access these memories instead they are accessed via input-output routines. Contents of secondary memories are first transferred to main memory, and then CPU can access it.

<u>Types of Secondary Memory</u>

Secondary memory can be of following types:

1.Magnetic. E.g. Magnetic disk, Magnetic tape, Hard disk and floppy disks

2.Optical. E.g. CD, VCD and DVD

3.Electronic. E.g. Flash Memory

4.Others. E.g. Punch card

<u>Floppy Diskette</u>: there are two standard sizes used these days that are 5

inches and 3   inches, in size, commonly referred to as the mini-floppy and

microfloppy. The capacity of 5   inches floppy is 1.2 MB and that of 3   inches

is 1.44 MB.

CD-ROM drives

They are of three types

a.   CD-ROM

CD-ROM stands for (Compact Disc Read Only Memory), and it is mainly used to

mass produce audio CD's and computer games. Computer users can only read

data and music from the discs, but they cannot burn their own information onto

the discs, from their personal computers.

b. CD-R

CD-R (Compact Disc Recordable) also known as WORM (Write Once Read Many) is a blank disc that users can put into a CD-ROM drive to burn or make a copy of their personal data, music, videos and information. CD-Recordable discs are designed for one-time recording only.

c. CD-RW

Unlike a CD-R, the CD-RW (Compact Disc Rewritable) can be erased and returned to its original blank state. New files can then be copied onto the rewritable disk. CD-RW never became as popular as the CD-R's because they are not compatible with most disc players to listen to music. They are primarily used to move data from one computer to another, or to copy files that are only needed a few times.

DVD (Digital Versatile Disk):

DVD is very similar to a CD but it has a much larger capacity. A standard DVD can hold 4.7 GB of data. DVD's are of the same types as CD's along with different formats as explained about CD's.

Combo Drives

These drives combine the function of a DVD drive and a CD-RW drive.

Hard disk: Largest in capacity

Differences between Primary and Secondary Memory

Primary Memory	Secondary Memory
These devices are temporary (Volatile)	These devices are permanent (Non-volatile)
These devices are expensive	These devices are cheaper
They have less storage capacity	They have storage capacities
They are usually faster	They are slower
Directly accessed by the CPU	Not directly accessed by the CPU

Logic Circuit I (Standard Single Logic Gate)

Definitions of Logic gate

1. A logic gate is an elementary building block of a digital circuit.
2. It is also defined as an electrical circuit, that performs one or more logical operations on one or more input signal.
3. Logic gates are devices that implement Boolean functions, i.e. it does a logic operation on one or more bits of input and gives a bit as an output.

Most logic gates have two inputs and one output. At any given moment, every terminal is in one of the two binary conditions *low* (0) or *high* (1), represented by different voltage levels. In most logic gates, the low state is approximately zero volt (0 V), while the high state is approximately five volts positive (+5 V).

Types of Standard Single Logic gate

There are basically three types of standard single logic gate. They are:

1. AND gate
2. OR gate
3. NOT gate

A.   AND gate`

An AND gate will give **a high output only if all of the inputs are high**. For example, in a simple lighting circuit with two switches in series the lamp will light only if both switches are pressed.

Logic Symbol for AND gate

Truth Table of the AND gate

INPUT	INPUT	OUTPUT
A	B	C
0	0	0
0	1	0
1	0	0
1	1	1

B.   OR gate

An OR gate is a digital logic gate that gives an output of 1 when any of its inputs are 1, otherwise 0.

Logic Symbol for OR gate

Truth Table of the OR gate

INPUT	INPUT	OUTPUT
A	B	C
0	0	0
0	1	1
1	0	1
1	1	1

A *NOT gate,* often called an inverter. A NOT gate is slightly different because it has **just one input**. It will give a high output if the input is low and vice versa.

Logic Symbol for NOT gate

Truth Table of the NOT gate

Input	Output
A	B
0	1
1	0

Logic Equations

Aside from representing the function of a logic gate with a truth table and grammatical definition, the use of logic equations can be used to represent logic gates and circuit.

AND GATE EQUATION

The AND gate operation can be expressed by a Boolean algebra equation. For a 2-input AND gate, the equation is:

$X = A.B$

The symbol for the AND operation is a center dot (.). It does not mean multiplication. The expression reads 'X' equals to A and B.

OR gate equation

The OR gate operation can also be expressed by a Boolean algebra equation. For a 2-input OR gate, the equation is:

$X = A+B$

The symbol for the OR operation is a +. It does not mean addition. The expression reads X equals to A or B.

NOT gate Equation

The NOT gate operation can also be expressed by a Boolean algebra equation

$X = \overline{A}$

A complement bar (also called an over bar) is placed over the assigned input letter. The expression reads 'X' is equals to not 'A'.

Logic Circuit II (Alternative Logic Gate)

Alternative logic gate are those that are the combination of two logic gates. There are two types of alternative logic gates:
1.   NAND gate
2.   NOR gate

NAND Gate

NAND gate is the combination of both an AND gate and a NOT gate. It operate the same as an AND gate but the output will be opposite.

Logic Symbol for the NAND Gate

OR

Truth Table for NAND Gate

INPUT	INPUT	OUTPUT
A	B	C
0	0	1
0	1	1
1	0	1
1	1	0

NAND Gate Equation

The NAND gate equation can also be expressed by a Boolean algebra equation. For 2 input NAND gate the equation is:

The expression is the same as the AND gate with an over bar above the entire portion of the equation representing the input. This equation reads X equals to A and B NOT.

NOR Gate

The NOR gate is the combine of both OR gate and a NOT gate. It operates the same as an OR gate, but the output will be opposite.

Logic symbol for the NOR gate

 OR

Truth Table for the NOR Gate

INPUT	INPUT	OUTPUT
A	B	C
0	0	1
0	1	0

1	0	0
1	1	0

NOR Gate Equation
The NOR gate operation can also be expressed by a Boolean algebra equation. For a 2 input NOR gate the equation is:
The expression read X equals to A or B NOT.

Uses of Logic gate
Logic gates are used to:
1. build digital circuit
2. design complex ICs
3. construct a simple alarm
4. control traffic light

Construction of a Simple Comparator using XOR (Exclusive-OR) gate
The exclusive-OR gate acts in the same way as the logical either/or. The output is true if either, but not both, of the input are true. Another way of looking at this circuit is to observer that the output is 1 if the inputs are different, but 0 if the input are the same.

Logic Symbol for the NOR gate

Truth Table for the XOR gate

INPUT	INPUT	OUTPUT
A	B	C
0	0	0
0	1	1
1	0	1
1	1	0

XOR Equation

Or

XOR Comparator
A comparator is a combinational logic circuit that compares the magnitudes of two binary quantities to determine which one has the greater magnitude. XOR can the used as a basic comparator.

Computer Data Conversion

Data Conversion: Data conversion is the conversion of computer data from one format to another.

Registers: Registers are temporary storage areas for instruction or data. It can also be defined as a special, high-speed storage area within the CPU. They are not part of the memory; rather they are special additional storage locations that offer the advantage of speed. Register works under the direction of the control unit to accept, hold and transfer instruction or data and perform arithmetic or logical comparison at high speed. Register are the fastest memory available for use in the PC, because they are hard-wired right into the processor logic.

Address: A memory address is an identifier for a memory location, at which a computer program or a hardware device can store data and later receive it.

Bus: A bus, in computing, is a set of physical connections (cables, printed circuits, etc.) which can be shared by multiple hardware components in order to communicate with one another. The purpose of buses is to reduce the number of "pathways" needed for communication between the components, by carrying out all communications over a single data channel. This is why the metaphor of a "data highway" is sometimes used. If only two hardware components communicate over the line, it is called a hardware port (such as a serial port or parallel port).

A bus is characterized by the amount of information that can be transmitted at once. This amount, expressed in bits, corresponds to the number of physical lines over which data is sent simultaneously. A 32-wire ribbon cable can transmit 32 bits in parallel. The term "width" is used to refer to the number of bits that a bus can transmit at once.

Additionally, the bus speed is also defined by its frequency (expressed in Hertz), the number of data packets sent or received per second. Each time that data is sent or received is called a cycle. This way, it is possible to find the maximum transfer speed of the bus, the amount of data which it can transport per unit of time, by multiplying its width by its frequency.

Example 1: What is the speed of a bus with a width of 16 bits and a frequency of 133 MHz?

Solution

There are generally two buses within a computer:

1. **Internal Bus**: The internal bus (sometimes called the *front-side bus*, or *FSB* for short). The internal bus allows the processor to communicate with the system's central memory (the RAM).

2. **Expansion Bus**: The expansion bus (sometimes called the *input/output bus*) allows various motherboard components (USB, serial, and parallel ports, cards inserted in PCI connectors, hard drives, CD-ROM and CD-RW drives, etc.) to communicate with one another. However, it is mainly used to add new devices using what are called expansion slots connected to the input/output bus.

Types of Register and their Functions

There are many types of registers; some of these are given below:

1. <u>Memory Data Register (MDR):</u> This register contains the data to be stored in the computer storage or the data after a fetch from the computer storage.
2. <u>Current Instruction Register (CIR)</u>: CIR stores the instruction currently being executed or decoded.
3. <u>Memory Address Register (MAR)</u>: MAR holds the memory address of data and instruction.
4. <u>Program Counter (PC):</u> PC commonly called instruction pointer (IP) and sometimes called instruction address register. It is a register that holds the address of the memory location of the next instruction when the current instruction is executed by the microprocessor.
5. <u>Accumulator Register</u>: This register is used for storing the results that is produced by the system.

Functions of registers

i. Holds the address of memory where CPU wants to read or write data

ii. Holds the contents of data instruction read from or written in memory

iii. Used to specify the address of a particular I/O device

iv. Used for exchanging data between the I/O module and the processor

v. Used to store the address of the next instruction to fetch for execution

vi. It stores current instruction being executed or coded

vii. It allows the bits of its content to be moved to left or right (shift register)

viii. It holds the memory addresses of data and instruction during execution phase

ix. It is used to store the result produced by the system

Differences between Registers and Main Memory

S/No.	Registers	Main Memory
1.	Registers are located inside the processor	Main memory is located outside the p
2.	They are very fast	They are slow

3.	They are small in capacity	They are large in capacity

Fetch-Execute Cycle

The steps in the processing cycle are as follows:

a. **Fetch the next instruction:** The program counter contains the address of the next instruction to be executed; the control unit goes to the address in the memory specified in the program counter, make a copy of the contents and places the copy in the instruction register.

b. **Decode the Instruction**: In order to execute the instruction in the instruction register, the control unit has to determine what the instruction is.

c. **Get Data If Needed:** It may be that the instruction to be executed requires additional memory accesses in order to complete its task. If this is the case, the control unit must get the content of the memory location.

d. **Execute the Instruction:** Once an instruction has been decoded and any data fetched, the control unit is ready to execute the instruction. Execution involves sending signals to the arithmetic/logic unit to carry out the processing. When the execution is complete, the cycle begins again.

Factors Affecting the Speed of Data Transfer

☐   The amount of RAM memory.

☐   The speed and generation of your CPU (the system clock)

☐   The size of the Register on your CPU.

☐   The Bus width

☐   The Bus speed.

☐   The amount of Cache memory.

System Development Life Cycle (SDLC)

Definition and Description System Development Life Cycle

1. System development Life Cycle (SDLC) is a conceptual model in project management that describes the stages in an information system development project.

2. The system development life cycle can be defined as a project management technique that divides complex projects into smaller, more manageable segments or phases.

A system development life cycle has three primary objectives: To ensure that high quality systems are delivered, to provide strong management controls over the projects, and to maximize productivity of the systems staff.

Stages of System Development Life Cycle

The following are stages of system development life cycle

a.   Preliminary study

b.   Feasibility study

c.   Investigative study

d.   System analysis

e.   System design

f.　　　Implementation

g.　　　Maintenance

h.　　　Study review

Description of each Stage

Preliminary study

The initial system study involves the preparation of a system proposal which list the problem definition, objectives of the study, terms and reference of study, constraints, and the expected benefits of the new system, etc.

Feasibility study

In case the proposal is acceptable to the management, the next stage is to examine is the Feasibility study. Feasibility study is basically the test of the proposed system in the light of workability, meeting user's requirements, effective use of resources and the cost effectiveness.

Investigative study

This involves detailed study of various operations performed by a system and their relationships within and outside the system. During this process, data are collected on available files, decision points and transaction handled by the present system.

System analysis

System analysis is a process of collecting factual data, understanding the process involved, identifying problems and recommending feasible suggestions for improving the functional system.

System Design

Based on the user requirements and the detailed analysis of the existing system, the new system must design. This is the phase of system designing. It is the most crucial phase in the developments of a system.

Implementation

After having the user acceptance of the new system developed, the implementation phase begins. Implementation is the stage of a project during which theory is turned into practice. The major steps involved in this phase are:

☐ Acquisition and Installation of Hardware and Software

☐ Conversion

☐ User Training

☐ Documentation

Maintenance

Maintenance is necessary to eliminate errors in the system during working life and to tune the system to any variation in its working environments.

Study Review

Review activities occur several times throughout this phase. Each time the system is reviewed, one of three of the following decision will be made:

☐ The system is operating as intended and meeting performance expectations

☐ The system is not operating as intended and needs corrections and modifications

☐ Users are/are not satisfied with the operation and performance of the system.

Program Development

Definition of Program

A program is a set of instruction that is executed by the CPU. A program can also be defined as an organized list of instructions that, when executed causes the computer to behave in a predetermined manner. Without program the computer is useless.

Characteristic of a Good Program

The following are characteristics of a good program.

Accuracy: Program should be sufficiently accurate to get the desire results.

Extensibility: this means that you so design your program that you can add and remove element from your program without disturbing the underling structure of the program.

Maintainability: this is making your code easy to update

Efficiency: a good program should be designed to use the least amount of primary memory and the fewest devices possible.

Generality: Design the program to be generalized and flexible, if possible

Portability: a good program can be moved to another environment

Simplicity: program logic should be as simple and as uncomplicated as possible

Transferability: plan the program to be as machine independent as possible.

Reusability: write code that will be able to be used in unrelated projects.

Leanness: leanness means making the design with no extra parts.

PRECAUTIONS IN PROGRAM DEVELOPMENT.

There are some certain precautions that one should take during the development of a program. These are

Patience: one should not rush up the programming process, although deadlines are important but that should not be at the expense of a faulty program.

Step Following: all steps of program should be followed religiously without any skipping any step or there will be erroneous results.

Execution order: the order of execution of instructions should be followed.

Fresh mind. One should be sufficiently fresh to work on a program, being free of any kind of fatigue.

THE PROGRAMMING DEVELOPMENT

Software development can be divided into several stages as listed below

1. Problem Definition
2. Problem analysis
3. Flowcharting

4. Desk checking

5. Program coding

6. Program compilation

7. Testing/Debugging

8. Program documentation

Problem Definition: This is the formal definition of task. It includes specification of inputs and outputs processing requirements, system constraint and error handling methods.

Problem Analysis: this step is the process of becoming familiar with the problem that will be solved with the computer program.

Flowcharting: A flow chart is a pictorial representation in which symbols are used to show the various operations and decision to be followed in solving a problem. Flow chart depicts the logic involved in the problem solution and therefore, is a step by step sequence that the program will describe to the computer.

Desk-checking: *Desk checking* is a manual (non-computerized) technique for *checking* the logic of an algorithm

Program coding: this is the process of transforming the program logic document into a computer language format.

Program compilation: A **compiler** is a computer **program** (or a set of programs) that transforms source code written in a **programming** language (the source language) into another computer language (the target language), with the latter

often having a binary form known as object code. The process of transforming source code into object code is called compilation.

Testing and debugging: This stage is the discovery and correction of programming errors.

Program documentation: Comprehensive information on the capabilities, design details, features, and limitations of the program so that those who use and maintain it can understand it, so that the program can be extended to further applications.

Algorithm and Flowchat

Definition Algorithm
Algorithm can be defined as the set of rules and sequential steps that define how a particular problem can be solved in finite and ordered sequence.
Function of Algorithms
An algorithm generally takes some input, carries out a number of effective steps in a finite amount of time, and produces some output.
Characteristics of Algorithms
Every algorithm should have the following five characteristic features
1.   Input
2.   Output
3.   Definiteness
4.   Effectiveness
5.   Termination

Example1: Write and algorithm to compute the area and circumference of a cycle given the diameter d. Use the formular and
Solution
Step 1: Start
Step 2: Get the diameter d
Step 3: Compute
Step 4: Compute
Step 5: Compute
Step 6: Display the results
Step 7: Stop

Example 2: Write an algorithm that tells you how to wash dishes
Solution
Step 1: start
Step 2: scrape food off dishes
Steps 3: wash the dishes with soap and water
Step 4: Rinse the dishes
Step 5: Dry them
Step 6: Stop

Example 3: Write an algorithm to evaluate the equation y = a(b-c)^2/d+2
Solution
Step 1: start
Step 2: input the value of a, b, c, d
Step 3: Value of y is to be calculated
Step 4: Calculate the value of b-c and denote f
Step 5: Calculate the square of f
Step 6: Multiply f by a and denote g

Step 7: Calculate the value of d+2 and denote h
Step 8: divide h by g
Step 9: We get the value of y
Step 10: Print y
Step 11: Stop

Definition of Flowchart

This is the graphical representation of steps involved in solving a given problem. More formally, flowchart is a pictorial representation in which symbols are used to show the various operation and decision to be followed in solving a problem. Some standard symbols used in drawing a program flow chart are:

Symbol	Description
	Terminal symbol: It is used represent start and end
	Input/output symbol: It is used to represent any input or output
	The processing symbol: It is used to represent some type of data manipulation or arithmetic operation.
	The decision symbol: it is used to represent a logical comparison operation.
	The direction of flow symbol: It indicate the next step in the program
	The connector symbol: it is used when several symbols displayed at one point might cause confusion and reduce understanding.

BASIC Programming II (Built-in Functions)

BASIC built in functions are predefined functions that performs a wide range of operation. A function is a structure that simplifies a complex operation into a single step. BASIC has a number of built-in functions that greatly extends its capability. They include the following:

1. **SQR Function**: The SQR function calculates the square root of a number. The general form of the function is SQR(X)
    Example:
    SQR(9) = 3
    SQR(2) = 1.414214

2. **INT Function**: The INT function finds the greatest integer less than or equal to a number. The general form of the function is INT(X)
    Example
    INT(15.46) = 15
    INT(-15.46) = -16
    INT(15.56) = 15
    INT(-15.56) = -16

3. **CINT Function**: CINT means Integer Conversion. This function is used to convert a number into an integer. It rounds off the number to the nearest integer value.
    Example
    CINT(15.46) = 15
    CINT(-15.46) = -15
    CINT(15.56) = 16
    CINT(-15.56) = 16

4. **Fix Function**: This function truncates the number into an integer. The General form of the function is FIX (X)
    Example
    FIX(15.46) = 15
    FIX(-15.46) = -15
    FIX(15.56) = 15
    FIX(-15.56) = -15

5. **ABS Function**: ABS means absolute. It is used to find the absolute value of a number. Absolute value of a number means the number without any sign. The general form of the function is ABS(X)
    Example
    ABS(+3.4) = 3.4
    ABS(-3.4) = 3.4

6. **RND Function**: RND means random. RND is a special function that gives us a random number between 0 and 1
   Example
   PRINT RND
   PRIND RND
   This program will print RND twice. Notice that you'll get to numbers that appear to be unpredictable and random. But, try running the program again. You'll get the same random numbers.

7. **COS, SIN, TAN, and ATN Function**
   The COS, SIN, TAN, and ATN trigonometric functions are used to find the Cosine, Sine, Tangent and Arctangent of a particular numeric expression. The general form is:
   COS(X)
   SIN(X)
   TAN(X)
   ATN(X)

8. **MODE Function**: It means remainder. This function returns the remainder. The general form of the function is X MOD Y
   Example:
   16 MOD 5 = 1
   30 MOD 5 = 0

9. **SGN Function**: It means sign. This returns the sign of the input number in numeric value. The general form of the function is SGN(X).
   Examples
   SGN(54) = 1
   SGN(-54) = -1
   SGN(0) = 0

10. **EXP Function**: It is used to find the natural exponent of x, where e = 2.718281828. the general form of the function is EXP(X)
    Example
    EXP(4) = 54.59815
    EXP(-5) = 6.737947E-03

11. **LOG Function**: This function returns the natural logarithm of a numeric expression (any positive numeric expression). The syntax is LOG(X)
    BASIC NOTATION
    a.   =   SQR(B^2-4*A*C)/2*A
    b.   (x-y)/(x+y)   =   (X-Y)/(X+Y)
    c.   = EXP(X^2+Y)-SIN(X+N*Y)
    d.   b=1/4ac   =   B = 1/4*A*C

    BASIC PROGRAM
    1.   Find the square root of numbers in a given range
       10 REM program to find the square root of numbers

```
20  INPUT "Enter the first number of range"; A
30 INPUT "ENTER the last number of range"; B
40 FOR I = A TO B
50  PRINT "the square root of "; A; "is"; SQR(A)
60  NEXT I
70  END
```

2.   Find the Sine of unknown values
```
10  REM Program to find the Sine of unknown value
20  INPUT "Enter the number"; A
30  LET S = SIN(A)
40  PRINT "The Sine of"; A; "is"; S
50 END
```

3.   Plot Cosine Graph
```
10  REM Program to plot cosine graph
20  SCREEN 13
30  FOR X% = 0 TO 360
40  PSET (X%, (COS(X% * 0.017453) * 50) + 50), 15
50  NEXT X%
60  END
```

Internet

Definition of Internet
Internet is a worldwide network of computers that share information. It is also defined as a global system of interconnected computer networks that use the Internet protocol suite to link devices worldwide.

Internet Terms
1. Cyber café: An internet café or cyber café is a place which provides internet access to the public, usually for a fee.
2. Cyber space: It is the electronic medium of computer networks, in which online communication take place.
3. Download: To transfer a file from remote computer to a local computer. In other words, it means to transfer a file from a web server to a web client.
4. Upload: Transfer a file from a local computer to a remote computer. In other words, it means to transfer a file from a web client to a web server.
5. Email: E-mail is mail that's electronically transmitted by your computer.
6. File Transfer Protocol (FTP): FTP is the standard method for downloading and uploading files over the Internet.
7. Homepage or Home page: This is the first page that appears when you visit any website. It is also the page of a Web site that provides the introduction or content with links.
8. HTTP: HTTP is an abbreviation for Hypertext Transfer Protocol. It is the set of rules by which Web pages are transferred across the Internet.
9. URL: URL Stands for "Uniform Resource Locator." A URL is the address of a specific web page or file on the Internet
10. World Wide Web (WWW): It is a system of interlinked hypertext documents access via the internet. It is also defined as part of the internet that contains linked text, image sound, and video documents
11. Website: A Website is a collection of World Wide Web pages or files.
12.Web page: A Web page is a single hypertext file or a page that is part of a Web site
13. Web server: A server is a computer that delivers web content to web browser.
14. Chat: An online text-based communication between internet users.
15. Chat room: A chat room is part of an online service that provides a venue for communities of user with common interest to communicate in real time.
16. HTML (Hypertext Markup Language). It is the language of the web.
17. ISP (Internet Service Provider): ISP is an organisation that provides access to the internet and web hosting.
18. Intranet: A private internet running inside a LAN
19. Browse: The term to describe a user's movement across the web
20. Web Browser (Internet Browser): A software program used to display WebPages. It is also defined as is a software application for retrieving, presenting, and traversing (moving through) information resources on the World Wide Web.

<u>Types of Internet Browser</u>

a. Mozilla fire fox
b. Opera browser
c. Microsoft Internet explorer (Microsoft edge)
d. Google Chrome
e. Apple Safari, etc

Features of Internet Browser
An internet browser has many different parts. They include:
1. Title bar: Displays the title of the open web page
2. Menu bar: The menu bar can be used to activate commands. Depending on the browser you are using, some contain the following: File, edit, view, tools, Bookmark, help, etc
3. Address Bar: An address bar is a component of an Internet browser which is used to input and show the address of a website. The web address is generally given in lowercase letters and is case insensitive. There are no spaces in a webpage or website address.
4. Status Bar: Status bar displays the status of the current page
5. Scroll Bar: This provides vertical or horizontal scrolling through the web pages.
6. Standard tool bar: Standard tool bar has many different buttons. They are explained below.
a. Back: To go back to previously viewed page
b. Forward: To move forward to a page which was viewed
c. Stop: To halt loading of webpage.
d. Refresh/Reload: To refresh the contents of the currently displayed webpage from the start
e. Home: To go to the homepage of the currently viewed website.
f. History: It displays a list of previously viewed website
g. Print: Prints the webpage with the default printer settings.

Types of Internet Services
Some services provided by internet are as follows:
1. E-mail
2. Discussion group
3. Video conferencing
4. FTP
5. WWW
6. Chat
7. Downloading files
8. Uploading files
9. Telnet
10. Usenet
11. Instant message
12. Blog
13. E-commence

The Benefits of Internet

1. Researching

In the past, we would have to go to a library to do research. Today all of this research is done online, in the comfort of your home or office. The main concern is to be conscious of sites with faulty information

2. Buying Online

Internet has brought about the easiest way of buying and selling of goods which is called e-commerce (Electronic Commerce). In e-commerce, the prospective buyer will book or register for the needed goods or services which will be delivered to them within a stipulated time.

3. Worldwide media accessibility

Internet has opened up all users to worldwide media. Internet radio is accessible to anyone in the world connected to internet.

4. Online Degree

The benefits of online education far outweigh any drawbacks - especially for anyone who works full time - since the logistics of driving to and from class would simply be too time consuming. Sure, there are some draw backs, such as not having face to face interaction with classmates.

5. Online Banking:

You can easily receive and pay your electronically with a couple of clicks.

6. Communication

Information can be transmitted from one place to the other with the use internet. For example sending and receiving e-mail messages, making phone calls, audio and video conferencing, sending and receiving fax messages, chatting and instant messages etc.

7. Searching:

Today, we have lighting fast search engines that can give us thousands of links based on specific keywords.

Electronic Mail (E-mail)

Definition of Electronic Mail

Electronic mail, commonly called email or e-mail, is a method of exchanging digital messages from an author to one or more recipients. It can also be defined as a system for sending and receiving messages electronically over a computer network.

E-mail Services

The following are services provided by email

1.   Sending/receiving emails
2. Chatting: The exchange messages online in real time with one or more simultaneous users of a computer network
3. Task List: Task is a feature designed to help you keep track of the things you need to do.
4. Share updates, photos, videos and links.

Steps to Create Email Account

Follow the steps below to create email account

1. Click On a web browser
2. Visit a website that offers an email service e.g. www.gmail.com
3. Click on the Free Sign Up Button
4. Enter all mandatory fields (First Name, Last Name, Gender, etc.)

5. Click the "Accept" - Button underneath

Email Address

An email address is the name for an electronic postbox that can receive and send email messages on a network.

Components of an Email Address

1. User Name: The user name is found on the left-most part of an email address, before the "@" symbol.
2. The "@" symbol (read as "at") is placed between the user name and domain name, without spaces or
3. Domain Name: An email address' domain is found to the right of the "@" symbol. It consists of the second- and top-level domains, separated by a dot

    i.   Second Level Domain: the second-level domain is the name of the business, organization or Internet service provider that owns that domain.

    ii.   Top Level Domain: Top level domain is what appears right-most in an email address after the second-level domain. Some top-level domains are generic such as .com, .net and.gov, and are referred to as gTLD or generic top-level domains. Others are country-specific such as .gov.mt (Malta), and termed ccTLD or country-code top-level domains.

    Examples;

Procedure for sending an Email

1. Log in to your email account

2. Click **Compose**.

3. A new blank email window will open up. In the 'To' box, type in the email address of the recipient.

4. You might want to include someone else in your email to 'keep them in the loop'. You can do this by clicking **Cc** or **Bcc**, which will open another field. 'Cc' means 'carbon copy' and 'Bcc' means 'blind carbon copy'

5. Type in the subject of the email. The subject field allows you to give the recipient an idea of the topic of your email, like a heading.

6. Type your message in the main body field of your email.

7. Email text can be formatted in a similar way to text in a word document.

8. Click the **Send** button at the bottom of the compose window.

Steps Involved in chatting

1. Click on Contacts

2. Select the name of the person you'd like to chat with, and click the Chat link to open a chat window.

3. Enter your message in the text field, and press Enter.

4. Wait for your contact to respond!

<u>The difference between email address and website address</u>

1. An email address has two components name; username and domain name. While the web address has only one address component, the domain name.

2. An email address is accessible to a single user, whereas a web address is accessible to all users.

<u>Advantages of Email</u>

1. It is very fast.

2. It is secure

3. Formatted files can be shared through attachment

4. lower cost than conventional mail