Output device

The devices which are used to display or produce meaningful result or information to the user.

**Types of output device**

a) Soft copy output device: Monitor, Speaker
b) Hard copy output device: Printer, Plotter

**Soft copy output** refers to data that is shown on a display screen or sound produced by speaker. This kind of output is untouchable.

**Hard copy output** refers to printed output printed on the paper or some material that can be touched and carried for being shown to others.
Monitor or VDU (Video Display Unit) / VDT (Video Display Terminal)

Monitor is the display screen that is used to display the text and graphics, allowing users to view the result of the processing. It is the most common and popularly used output device for producing soft copy output. It displays the generated output on a television-like screen.

Types of Monitor

a) Monochrome Monitor
b) Color Monitor
   i) CRT Monitor
   ii) LCD Monitor
   iii) LED Monitor
Monochrome Monitor

It display only one color such as green or white against a contrasting background which is usually black. This monitor is used for text only displays. It basically possesses only two color, one for foreground and one for background.

Color Monitor

This type of monitor can display 16 colors to several million colors.
CRT (Cathode Ray Tube)

It is most common type output device of modern digital computer. It has an electron gun located at the back of a tube which produces the electron beams. The screen has a layer of phosphor which emits light when it is struck by electron beam.

The monitor is composed of a number of dots arranged in rows and columns. Each dot is called picture element (pixel). Picture is displayed on the screen by brightening or darkening the selected pixels.

The **resolution** of the screen means the number of pixels per unit of the screen.
Advantages

- High refresh rates.
- Color clarity and depth.

Disadvantages

- Very heavy and large.
- Use large amounts of energy.
- Generate excess heat.
LCD (Liquid Crystal Display)

LCD is a thin, flat electronic visual display that uses the light modulating properties of liquid crystals. It does not emit light directly.

They are common in consumer devices such as video players, gaming devices, Clocks, Watches, Calculators, Television and laptop etc.

They are usually more compact, lightweight, portable, less expensive, more reliable, and easier on the eyes.
Advantages

- Smaller and Lighter.
- Less Power Consumption.
- Causes less eye fatigue.

Disadvantages

- Motion Blur on fast moving images.
- Some models have reduced color clarity.
LED (Light Emitting Diode)

A light Emitting diode is a semiconductor device that emits visible light when an electric current passes through it. The chip has two regions separated by junction.

Hard copy output devices

Printer

Plotter
Printer
Impact and Non Impact Printer
Dot matrix printer
Advantage of Dot matrix
Disadvantage of Dot matrix
Inkjet Printer
Advantage of Inkjet printer
Disadvantage of inkjet Printer
Laser Printer
Advantage of Laser Printer
Disadvantage of Laser Printer
Thermal Printer
Plotter
Interfaces and Ports

Interface is the point where a connection is made between two different parts of a computer system, such as between two hardware devices, between a user and a program or between two application programs.

It is also called port. Data and information flow in and out through these ports in computer system.
Parallel port.

It allows the transfer of all the bits of a word simultaneously or in a parallel way. There are multiple lines of wires to connect the peripherals to the port in parallel port. A dot matrix printer is also typically connected to a parallel port.

Serial port.

It allows the transfer of data in a serial way. In serial port, only one line/ wire is used to transfer data. It is used for slow speed peripherals as keyboard, mouse, modem etc.
USB Port:

It is the universal port and it is also used to connect different peripherals to a computer system. Data and information can flow in and out through the USB port.

It is the high speed serial bus. Its data transfer rate is higher than the normal serial port. It supports interface for a wide range of peripherals such as USB keyboard, USB mouse, USB modem, digital camera, webcam etc. can be connected to the same USB port.
IEEE 1394:
- It stands for ‘Institute of Electrical and Electronic Engineers’
- It is acting as a coordinating body.
- It port is a serial bus interface standard for high speed communication for digital audio, digital video.
- Lower implementation cost and a simplified
- More adaptable cabling system.
Slots

- Slots are the inbuilt interfaces in the motherboard of computer system.
- It connect with different devices such as RAM, internal modem, sound cards etc.

**Types of Slots**
- PCI (Peripheral Component Interconnect) Slot
- SCSI (Small computer system Interface)
- IDE (Integrated Drive Electronics)
Identification of PC Accessories and Peripherals

- System Unit (CPU)
- Screen
- Monitor
- Speaker
- Keyboard
- Mouse
- Microphone
- Casing
Internal View of PC

- SMPS Cooling Fan
- Optical ROM
- Processor Cooling Fan
- Processor
- Extended Slots
- RAM
- SATA Cable
- Internal Speaker
- Hard Disk
Software

- Software consist series of instruction and decision rules that instruct the computer in executing a given task. Software is also called a computer program. It is a written by a using a programming language.
- It is a group of command that tells the computer what to do and how to do.
- It is the interface between the computer and the user.
- Without software a computer can not do any thing like a dead machine.
Types of Software

1. System Software
   i. Operating System
   ii. Translating Program
   iii. Utility software or system support program

2. Application Software
   i. Customized or Tailored Software
   ii. Packaged Software
Relationship between User, Application Software, System Software and Hardware
System Software

- The software which is designed to operate, control and manage the actual operation of computer hardware is called system software.
- The system software controls internal computer operation like reading data from input devices, sending, processed information to the device, checking system component, converting data and instruction to computer understandable (binary) form etc.
1. Operating System

- It is a program which act as an interface between the user, application program & hardware.
- Without OS, We can not start the computer & run other programs.
- It controls the execution of computer program like scheduling, debugging, input output control, compilation, storage & management of data etc.
- Example windows xp, windows 7, windows 8, Unix, Linux etc.
2. Translating Program

- Translating program is used to transfer instructions written in human understandable or readable languages like VB, C, ASP.net, Java etc. to machine language which the computer understands. There should be one translating program for each programming language.

- The translation program are assembler, compiler and interpreter.
3. Utility Software

- Utility software (also known as service program, service routine, tool or utility routine) is computer software designed to help manage and tune the computer hardware, operating system or applications software by performing a single task or a small range of tasks.

- Examples are Disk fragmentation, Disk Cleanup, Backup & Recovery, Antivirus, File managers, Data compression etc.
Application Software

• It is designed to do only specific task is called application software.
• The application software made for one purpose can not do other task.
• Examples, Word processing, Inventory control, financial accounting, Result preparation, Reservation etc.
1. Tailored or Customized Software

- The software which is designed to meet the specific requirement of a particular person or an organization is called Tailored Software.
- It is written according to the demand of person or and organization.
- The tailored made for one organization can not be used in another organization.
- Examples, Payroll system, sales ledger, Salary sheet, School Management System, Library System etc.
2. Packaged Software

- The software which is design to meet the common requirement of different people & organization. It is not possible to design software to fulfill the requirement of each of them.

- It is also called universal software.
- It should be user friendly.
- It should have menu driven facility.
- It should be designed for general purpose.
- E.g. Ms-office (word, excel, PowerPoint etc.), Adobe Photoshop etc.
Computer Virus

*Virus is a program intended to damage our computer system.*

*A computer virus is a malicious program.*

*It damage or corrupt data, change data or degrade the performance of the system by utilizing resources such as memory or disk space.*
Virus Transfer over

- E-Mail and Internet
- Floppy disk, CD, DVD or USB drive.

Examples of Virus

- Worm, Trojan horse, spyware, crime-ware, Macro Virus, Boot sector virus, Polymorphic viruses.
Protection from Virus

- Do not use pirated software
- Install and upgrade regular antivirus software
- Write protect your USB drive when using the on the computer.
- Scan the mail and unknown file of internet before opening in your computer.
- Backup your system on regular basis.
• Lock the computer when not in use.
• Use the password system to avoid unauthorized use of the computer.
• Check the new software for virus before installing it.

Antivirus
Antivirus software is the software that can protect from viruses and eliminate viruses so that the computer system runs smoothly.
Examples of antivirus:
AVG, MacAfee, Kaspersky, Norton, Panda, PCCillin, Scan Utility, Avira etc.
Unit-6 Operating System- 10 m.

- What is Operating System? Explain.
- Why operating system is a resource managers or virtual memory? Explain.
- Role of Operating System
- Function/Features of Operating System
- Types of Operating System
What is Operating System? Explain/

Why operating system is a resource managers Explain.

- Operating system is a computer program (a system software) that acts as intermediate between the user and computer hardware. On other word operating system is an organized set or collection of software program that control the overall operation of the computer system.

- Fig. interface between the user & computer hardware
Operating system is the master software to the computer. Without operating system computer is a like death machine (Ideal) so that it controls the overall parts of computer and force. It’s to function like a working computer.

During starting to the computer operating system can control and handed overall function like memory management, CPU management. Input output device management etc. Therefore operating system like a soul of human being.
As computer consist of various resources (parts) like memory, CPU, disk etc. it’s very difficult for the user computer to understand how to operate them directly. So operating system became interprets between the computer hardware and user.

OS is a resources manager which is used to operate the computer properly by managing following.

- Memory Management
- I/O Mgmt.
- Process Management
- Error prompt Mgmt.
- File Management
- Data & programs Mgmt.
What is set up time?

- The time spent in loading, unloading, mounting of the program is called set up time.
Role of operating system

- **Resource allocation:**
  - The computer has many resources (hardware and software) which may be required to manage CPU time, Memory device, file, input, output device etc.
  - The OS act as a manager of these resources and allocates resources as required.
Control Computer system

- OS control the execution of user program to prevent error and improper use of the computer.

User interfaces:

OS interfaces between user and computer resources. The user may be person or application like virus, messenger, MS-word. User interface provided easy way to run commands, copying file, deleting file, installing application program etc.
Reason for Development of OS

- Set up time
- Manual information
- Imbalance between processor and peripherals
Interrupt handling

Interrupt is an event that alters the sequence in which the processor executes instructions.

Types of Interrupt

Hardware Interrupt:

Interrupt generated by hardware devices such as keyboard, printer or chips on the system board is called hardware interrupt.

Software Interrupt:

Interrupt signals generated or caused by programs or software are called software interrupts.
Deadlock Prevention

In an operating system, a deadlock is a situation which occurs when a process enters a waiting state because a resource requested by it is being held by another waiting process which in turn is waiting for another resource.
Types of OS

Based on Processing Method
1) Batch Processing OS
2) Multiprogramming
3) Multitasking
4) Multiprocessing
5) Time sharing
6) Real time system
7) Network and Distributed system

Based on User Interface
1. GUI
2. CUI or CLI

Based on Mode of user
1. Single User OS
2. Multi user OS
Batch Processing OS

- Batch processing operating system allowed to run only one program at a time. Batch processing operating system works on a series of programs which are held in a queue. The jobs with similar requirement were batched (grouped) together and run as a group is called batch processing.

- Example: MVS, MVS/ESA
Multiprogramming

- Multiprogramming allows execution of two or more programs in a main memory of the computer. In this environment, processor processes several programs simultaneously.
Multitasking

A system able to process a number of tasks at a time is called multitasking. It allows more than one program to run concurrently.
Multiprocessing

Multiprocessing refers to a computer system’s ability to support more than one process (program) at the same time. Eg. UNIX, MVS (Multiple virtual System).
Time Sharing System

It is a kind of multiprogramming OS which operates in an interactive mode with quick response time. The user request to the computer and get response on the user terminal. Hence this operating system is also called Online Operating System. A time sharing system allows the many users to simultaneously share the computer resources. Example CP/CMS.
Real Time Operating System (RTOS)

- Real time operating system is a method which controls the environment by receiving data, processing them and taking action quickly at that time.

Application
- Rocket launching
- Monitoring and controlling nuclear power station
- Robotics
- Traffic light control
- Airlines reservation

Example,
Network and Distributed system

- Network operating system works under client/server principle. The server provides services such as mail, database, printing etc. Client computer take service provided by the server.

- When computers in a group work in cooperation, they make a distributed system.
Based on user Interface

- **GUI (Graphical User Interface):**
  GUI allows you to enter commands by pointing and clicking at objects that appear on the screen.

**Features of GUI**

- GUI is graphical and user friendly.
- Users don’t have to remember syntax and commands.
- It needs a large amount of memory space.
- It runs other Windows-based programs like Ms-word etc.
- It provides utility software to improve the functionality of the computer.
• It consists of different components such as text box, icon, desktop, pointing devices etc.
• It needs faster processor to operate.
• In GUI, other peripherals like mouse, light pen, joystick can be used.
• It supports multimedia environment.
• It supports multitasking, multiprogramming, multithreading etc.
In CUI, where the user provides the input by typing a commands string with the computer keyboard and the system provides output by printing text on the computer monitor. So, the commands are accepted and executed by a part of the OS called CUI.

**Features of CUI**

- CUI is more textual and less user friendly.
- User have to remember syntax and commands.
- It needs less amount of memory space.
It does not contain different components such as text box, icon, desktop, pointing devices etc.

CUI is faster than GUI.

Other peripherals like mouse, light pen and joystick are not recognized.

It can not display graphics, pictures or icon.

It does not support multimedia environment.

It does not support multitasking, multiprogramming, multiprogramming etc.
Based on Mode of user

- **Single User OS:**
  
  It allows one user at a time. Normally, only allows one user program to be run and processed at a time. It based on small microcomputer which allows a single user to operate the machine. Example are MS-DOS, PC-DOS etc.
Multi User OS:
It allows two or more users to run program at the same time. Some OS permit hundreds or even thousands of concurrent users. The OS systems of mainframe and minicomputers are multi-user systems. Examples are UNIX, LINUX etc.
The function of Operating System

1. Process Management
2. Memory Management
3. Storage Management
4. Input/output
5. File management
6. Protection and security management
7. Network Management
8. Command interpretation management
9. Virtual memory management
10. Backup and Recovery Management
Booting

- It is the process of loading the system files of operating system in the memory of computer is called booting.

1. Cold Booting:

   When the computer is at off state and the user puts on the power switch on the computer, the computer reads it RAM space and searches for system files of DOS from disk drive.

2. Warm booting:

   When the user is working with the computer and wishes to reboot the computer, i.e. press CTRL+ALT+DEL key at the same time.
System Files

1. CONFIG.SYS: It is a configuration file which contains commands that configure hardware and reserves space in memory for processing of information.
IO. SYS

- This file interacts between computers ROM BIOS (Read only Memory Basic Input/Output System) and calls from the MSDOS.SYS program.
MSDOS.SYS

- This file interacts directly with application programs and IO.SYS. It acts as a bridge between application programs and IO.SYS.
AUTOEXEC.BAT

It contains a series of DOS commands. These commands are executed automatically in sequence at the time of booting of computer since this file is executed automatically at the time of booting of computer.
COMMND.COM

- This file is also termed as command processor. It intercepts commands from the keyboard and executable commands files. It also produces the DOS disk prompt, performs error checking and displays error message when system errors are detected.
DOS (Disk Operating System)

- Microsoft DOS is a command line user interface first introduced in 1981 for IBM computers and was last updated in 1994 when MS-DOS 6.22 was released. Although MS-DOS is not commonly used today, the command shell used through Microsoft Windows is. This page contains complete information about MS-DOS and the Windows command line.
MS-DOS (Microsoft Disk Operating System) is a single-user, single-tasking computer operating system that uses a command line interface. In spite of its very small size and relative simplicity, it is one of the most successful operating systems that have been developed to date.
• DOS is a single user OS
• DOS type OS run on old machines with the Intel 8086 and later processor and other IBM computer.
• DOS supports only one user and one program at a time.
• It can't support GUI and other pointing devices.
• It can handle less amount of memory.
• Largest executable program size will be less than 619 KB.
• It supports only 16-bit programs.
• It is single tasking OS.
• DOS was used in two versions
  • Microsoft versions called MS-DOS
  • IBM version called PC-DOS
Types of Dos Command:

2.1) *Internal Command*

- Internal commands are part of command interpreter file COMMAND.COM. Internal commands are loaded to memory during booting.
Internal Command are

- del - delete files
- rd - delete directories
- dir - show content of directories
- cd - change current directory
- cls - clear the screen
- md - create a directory
- copy - copy of one or several files
- ren - rename of files or directories
- type - shows the content of text files
- set - shows the DOS environment variables or defines a new one
- ver - shows the DOS version number
- vol - shows the name of the storage drive
2. External Command

- External commands are non-memory resident commands. Its procedures are stored in files in disk. The command is loaded in the memory only if that command is used.
External DOS commands

- `attrib` - shows the attributes of files or set one of those
- `fdisk` - partitioning or modify of the hard disk
- `move` - move of files
- `mem` - shows the occupancy of working memory
- `tree` - shows the directory structure
- `format` - format of storage drives
**Command:**
Any instruction given to the computer through a suitable input device to perform a task is known as command.
File

It is the collection of related information. All the information is stored under a unique file name.
File name

- A file name is a unique identify of a file. File names are divided into two pars, first is called primary file name and the second part is called the extension which is separated by a period dot (.)
Extension

- It helps us to understand the file type. According to the extension we can know the software package used to create and edit the file.
Types of File

1. Program or Executable file (.exe, com, .bat)
2. Graphics file or pictures files (.bmp, .jpg, .gif)
3. Data file (.dat, .mdb)
4. Text File (.doc, .txt, .ini)
Directories:

Directories are a type of box or path for other directory. Hence it is a catalog for filenames and other directories stored on a disk. It is also called 'folder' in windows users. It holds something (files or directories).
**Wildcards:**

Wildcards are the special keyboard characters which are used in DOS along with command name. Wildcards help to copy, delete and other activities to a group of files.
examples

- * = Asterisk
- / = Forward Slash
- : = Drive Name
- ? = One character
- ^ = Carat
- | = Pipe
- > = Redirection character
Desktop

- Desktop is the background displayed on computer screen.
- It is total visible area on the screen.
- The desktop may contain many items such as: My computer, My Network Places, My Documents, Recycle Bin, Internet explorer etc.
Icons

- Icons are the small graphical image used in GUI OS environment.
- Icons help to execute commands, open programs or documents quickly.
- An Icon is a group of images of various formats (size and colors).
Backup
• It is used for the backup or extra copy of data and information on the computer disk or outside tape drive.

Restore
It is the process of generating information from the stored device.
Disk Cleanup

- It is used to erase computer system used unnecessary files.
Disk Defragmenter

- It is a system utility for analyzing local volumes and locating and combining fragmented files and folders into one segment.
- It is efficient tools for making computer system faster and efficient.
OSOS (Open Source Operating System)

- It is an operating system that is free to use and which provides the original code where the source code is available (under a copyright license) to the public, which enables them to use, modify/enhance the operating system, and redistribute the modified (or unmodified) form of the operating system.

- Some examples of OSOS are Linux, Free BSD, Open BSD, Open Solaris, and Free DOS etc.
The characteristics of OS

- Free Redistribution of software and code.
- Derived works.
- Integrity of the author’s source code.
- No Discrimination against Persons, Groups or Field.
- Distribution of license.
- License must not restrict other software.
Advantage of OSS

- It is free or has to pay nominal fee.
- It does not require buying license published by company.
- Multiple distribution.
- It software are freely available on the internet with coding.
Disadvantage of OSS

- No support is available.
- It product may not be fully tested or modified by inexperienced developer, hence it can cause problem on computer.
- OSS are not popular in market.
- Limited choice of application software.
- OSS are complex to use.
UNIX:

- UNIX is a popular open source operating system used in large variety of scientific, engineering and mission critical applications. UNIX was written in Assembly language at first and then re-written in C programming language and other machine independent languages by Dennis Ritchie and Ken Thompson at AT&T in 1968.
UNIX is an OS designed for use on any kind of computer or computing device.

Current versions of UNIX are running on everything from supercomputers to mobile phones.

It has GUI based.

UNIX is also an attractive tool for internetworking.

The different versions of UNIX are Sun Solaris, GNU/Linux, and MacOS X.
Features of UNIX

- Multiuser OS
- Multitasking OS
- Reliable and Efficient OS
- Portability OS
Linux

- Linux is a free open-source operating system based on UNIX. Linux was originally created by Linus Torvalds with the assistance of developers from around the globe. Linux is free to download, edit and distribute. Linux is very powerful operating system. Linux is widely used for both home and office uses. It is the main OS used for high performance business and in web servers.
Advantage of Linux

- Low cost.
- Stability
- Performance
- Networking
- Flexibility
- Compatibility
- Wider Choice
- Fast and easy installation
- Better use of hard disk
- Multitasking
- Security
Some Linux Commands

- **mkdir** - It is used to make directories.
  
syntax : `mkdir directory`

Example: `mkdir ram`

- **cd** – cd command is used to change directories.
  
Syntax: `cd directory`

Example : `cd hello`

- **rmdir** – It removes an existing directory.
  
Syntax: `rmdir directory`

Example : `rmdir testdir`