

Chapter 2
Types of
software

Computer Science

Class XI (As per
CBSE Board)

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Types of software

Software is an organized instructions/code written by programmers using any of various special computer languages for specific purpose.

Types of software:

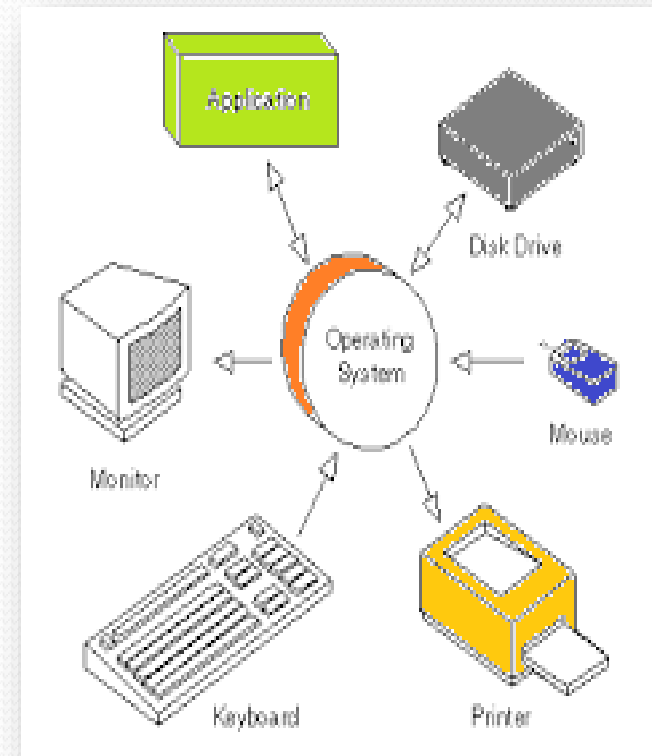
- (1) System software: controls the basic functions of a computer & hides complexity of computer system from user and application software. E.g. Operating System, Compiler, Interpret etc.
- (2) Application software: It handles specialized/ common tasks a user wants to perform, such as banking, hotel management, any data processing, word processing etc.
- (3) Utility software: Which helps to manage, maintain and control computer resources. E.g. are antivirus software, backup software and disk tools.

(1) System software

OPERATING SYSTEM

An Operating System (OS) is a system program that controls and manages the computer resources (resource manager) so that application software can run on it.

Example: Microsoft Windows, Solaris, Linux, MAC OS, Ubuntu, Apple's iPhone OS etc.



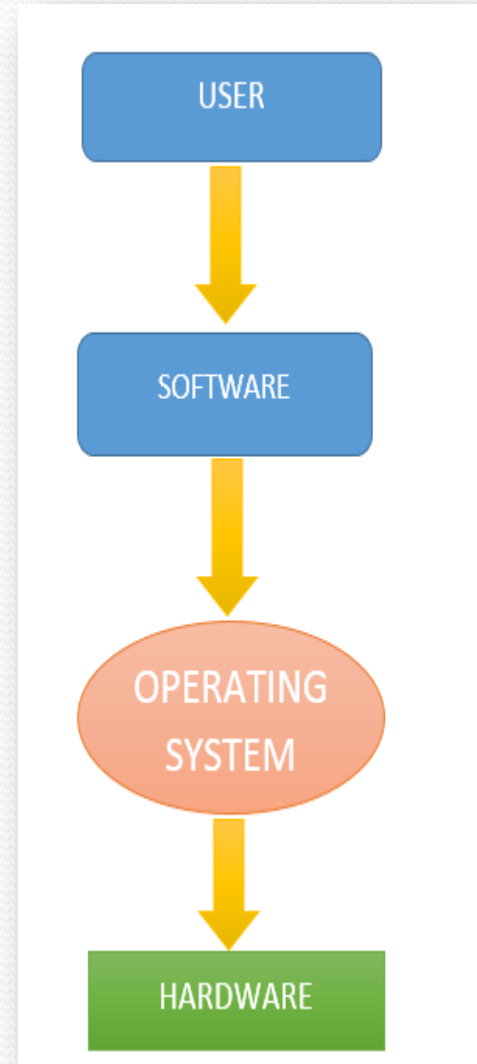
Operating Systems

HOW OPERATING SYSTEM WORKS

In any computer or mobile device, the operating system can be termed as the back bone when it comes to software. This is because it has to be there before other programs can be run. It works as a middleman (interface) between machine and user.

At the simplest level, an operating system does two things:

- It manages the hardware resources of the computer system. These resources include such things as the processor, memory, disk space, etc.
- It provides a stable, consistent way for applications to deal with the hardware without having to know all the details of the hardware.



FUNCTIONS OF OPERATING SYSTEM

- **Processor management**

Loads, schedules and execute process/programs.

- **Memory management**

Allocates /De-allocation of memory for program execution.

- **Device management**

Communicate and controls various I/O devices.

- **Storage management**

Manages and controls the storage device to provide space to program for execution & data save.

- **Application interface**

API/drivers provide a way for applications to make use of hardware

- **User interface**

structure for interaction between a user and the computer

Process management

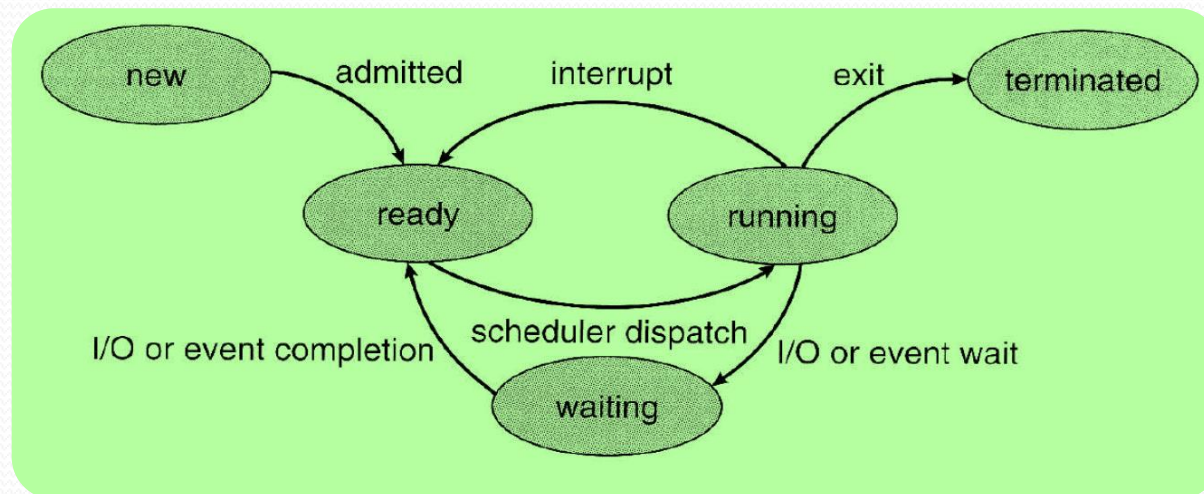
- **Process** a program in execution is known as process
- Handling of multiple processes at a time is known as process management.
- Process States

A process is typically in one of the three states

Running: has the CPU

Blocked: waiting for I/O or another thread

Ready to run: on the ready list, waiting for the CPU



TYPE OF OPERATING SYSTEM

*** Single-User, Single Task Operating System:**

These operating systems work on single task & single user at a time. E.g. DOS

*** Single-User, Multi-Task Operating System:**

These operating systems work on more than one task and process them concurrently at a time. E.g. windows 95 or later version of windows

*** Multiuser Operating System:**

In these OS, multiple users are allowed to access the same data or information at a time via a network. E.g. Unix, Linux, Windows 7.

*** Multiprocessing Operating System:**

Here, a single process runs on two or more processors. All the processing and their management takes place in a parallel way, hence this OS are also called as Parallel Processing. E.g. Linux, UNIX and Windows 7.

*** Embedded Operating System:**

These are embedded in a device, which is located in ROM. E.g. OS of microwaves, washing machine.

*** Distributed Operating System:**

In these OS, the computers work in co-operation with each other.

Types of software

SYSTEM SOFTWARE/PROGRAMMING SOFTWARES

Language processor/Programming tool

As the computer understand machine language(0/1) where as Humans understand High level/Human Lang. Language Processors does the conversion task(high level to machine lang.)

These are of 3 types Language processors

1. **Compilers**-It convert high-level language code to machine code in one session. It takes time because it have to translate high-level code to lower-level machine language all at once and then save the executable object code to memory.
2. **Interpreters**-It translates code like a compiler but reads the code and immediately executes that code, and therefore it is faster than a compiler.
3. **Assemblers**-It translates an assembly language program into machine language.

One-pass assemblers go through the source code once. Any symbol used before it is defined will require "errata" at the end of the object telling the linker or the loader to "go back" and overwrite a placeholder which had been left where the as yet undefined symbol was used.

Multi-pass assemblers create a table with all symbols and their values in the first passes, then use the table in later passes to generate code.

Difference between Compiler and Interpreter:

S.N O.	COMPILER	INTERPRETER
1.	Scans the whole program in one go.	Translates program one statement at a time.
2.	the errors (if any) are shown at the end together.	errors are shown line by line.
3.	Main advantage of compilers is it's execution time.	Due to interpreters being slow in executing the object code, it is preferred less.
4.	It converts the the instructions into systematic code.	It doesn't convert the instructions instead it directly works on source language.
5	E.g. C, C++, C# etc.	E.g. Python, Ruby, Perl, MATLAB etc.

(2) Application software

* General Purpose application software

These are ready to use software for daily use purpose
e.g. word processor, spread sheet, presentation, DBMS etc.

* Specific Purpose application software

Softwares which are designed for specific task
e.g. Payroll, Hotel Mgmt, Hospital Mgmt, Stock Mgmt etc.

(3) Utility software/System Utilities

that assist OS in carrying out certain specialized tasks are called utility software.

- **Antivirus** - An anti-virus scans the system for any virus and if detected, gets rid of it by deleting or isolating it.
- **Compression tools** - Compression tools are utilities that assist operating systems in shortening files so that they take less space.

(3) Utility software/System Utilities

- **Disk Cleanup** - Disk cleanup tools assist users in freeing up disk space.
- **Disk Defragmenter** - Disk defragmenter is a disk management utility that increases file access speeds by rearranging fragmented files on contiguous locations.
- **Backup** - Backup utility enables backing up of files, folders, databases or complete disks.
- **File management tools** - Utility software providing regular file management tasks like browse, search, update, preview, etc. are called file management tools.
- **Restore** - This utility restores the backup earlier taken.
- **Device driver** or hardware driver is a group of files that enable one or more hardware devices to communicate with the computer's operating system. Without drivers, the computer would not be able to send and receive data correctly to hardware devices, such as a printer