TYPES OF SOFTWARES

Defination:

A set of programs that governs the operation of an entire computer system and its related devices is known as software.

Software enables the hard ware to carry out the functions properly. In other words, the software instructs the hardware what to display on users screen, what kind of input to take from users and what kind of output to generate. Software makes the hardware to work.

Characteristics of software

- Software is intangible means it cannot be touched.
- Software is a set of programs.
- Software is complement to hardware.
- Good software has portability.
- Software makes the computer work.

Software can be broadly divided into 2 categories such as

- System software
- Application software

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SYSTEM SOFTWARE

i. System software is a collection of programs that governs the entire hard ware operation and supports the applications software.

ii. System software helps run the computer hardware and computer system.

iii. It is a large amount of software that is produced by the computer manufactured or software enterpriser.

iv. Some common examples of system software are –

- BIOS
- Operating System(O.S.)
- Device drivers
- Language processors

BIOS (Basic Input/Output System)

i. Commonly known as the system BIOS.

ii. It is designed to be first set of instructions run by a computer when power on.

iii. The initial function of the BIOS is to initialize system devices such as the RAM, hard disk, CD/DVD drive, video display card and other hard ware components.

iv. The BIOS sets the machine hardware into a known state to the help the operating system to configure the hardware components. This process is known as booting or booting up.

v. BIOS programs are stored on a chip (BIOS chip) which is fitted into the mother board of a computer system.

Operating System

i. Operating system is a system software which controls the automatic operation of the computer.

ii. It controls and co-ordinate all the resources available in the system.

iii. It acts as an interface between the user and the computer.

iv. The core part of the operating system is the kernel, stays loaded into main memory all the time.

v. The operating system performs important tasks like receiving input, sending information to output device, keeping track of files and directories in the memory as well as controlling the various peripheral units such as printers, monitors, keyboards etc.

vi. Without an operating system machine can't work.

Need for an operating system :

All operating system are designed to perform the following basic operation

- Send information to the computer through the keyboard.

- Display result on the monitor.
- Send information to a printer.
- Read or write files onto secondary storage.

<u>Major functions of an operating system :</u>

An Operating System is responsible for the following functions.

- Communicate with hardware and the attached devices (Device Manager)
- Manage different types of memories (Memory Manager)
- Provide a user interface (Interface Manager)
- Provide a structure for accessing an application (Program Manager)
- Enable user to manipulate programs and data (Task Manager)
- Manage the files, folders and directory systems on a computer. (File Manager)
- Provide basic networking structure for LAN (Local Area Network) and Internet (Network Manager).

- **Provide a minimal security to the computer system through authorization (user name) and authentication (passwords). (Security Manager)**

Tasks of the operating system

Types of operating system

Following types of operating system are generally available and used depending upon the primary purpose and application. And type of hardware attached to the computer.

- **Single user operating system :**

Allows one user to operate the computer and run different programs on the computer. MS-DOS is a common example of single user operating system.

- **Multi user operating system**

Allows two or more users to run programs at the same time on the single computer system. Unix, Linux, Windows are common examples of multi user operating system.

- **Real time operating system**

Responds to input instantly. Real time operating systems are commonly found and

used in robotics, complex multimedia and animation, communications and has various military and government uses. Linux and windows ce are examples of real time operating systems.

- **<u>Multi processing operating system</u>**
  Supports allocating programs on more than one cpu

- **<u>Multi tasking operating system</u>**
  Allows more than one program (task) to run concurrently.

- **<u>Multi threading operation system</u>**
  Allows different parts of a single program to run simultaneously.

  Some time operating systems are also categorized as

i) PC (Personal Computer) Operating System

ii) Server Operating System

iii) Mainframe Operating System

iv) Handheld Operating System

v) Mobile Operating System

Device driver :

i. A device driver is system software that operates controls a particular type of device that is attached to a computer.

ii. Device driver simplify programming by acting as translator between a hardware device and the applications or operating systems that use it.

iii. All computer accessories like printer scanner webcam etc come with their own driver software.

Language processor

A computer system understands the instructions only in binary language (also called as Machine Level Language(M.L.L.) or known as Low Level Language (L.L.L.) or Binary Level Language (B.L.L.)) .

Any program written in high level language (HLL) is called source program. As source program is written in HLL, computer

cannot understand it. So it has to be translated to Machine Level Language.

The software which does the translation of source program to object program and vice-versa is called as language processer or translator.

| PROGRAM IN HLL (SOURCE CODE) | ◁ TRANSLATOR ▷ | PROGRAM IN MLL/LLL (OBJECT CODE) |

Basically there are 3types of translator

- **Assembler**
- **Compiler**
- **Interpreter**

Assembler :-

A programming language which is very close to the Low Level Language is called an assembly language .This language consists of mnemonic codes, is difficult to learn and is machine dependent. A language processer which translates a program

written in assembly language into machine language is called as assembler.

Compiler : -

Compiler is a system software which translates the HLL into MLL. It is software which translates the whole program at a time when it is completely fed into the computer. Using compiler all the errors appear at a time. So it becomes a very tedious job of locate and correct errors.

Interpreter :-

It is also a system software which translators the HLL to MLL. It interpretes each line simultaneously when enter to the computer. As we press enter key the message is inserted in the computer and the same line it gets converted into machine language by the help of interpreter.

Difference between compiler and interpreter : -

Compiler :

1) It translates source code into object codes as a whole.
2) Requires more money.
3) Program execution is very fast.
4) Compiler saves the machine codes permanently for future references.
5) If error is detected nothing being executed.
6) Slow for debugging (removed of mistake from a program).

Interpreter :

1) It translates the statements of the source code one by one and execute immediately.
2) Requires less money.
3) Program execution is slow.
4) Machines codes produced by interpreter are not saved.
5) If error is encounter execution stops but previous statements are already executed.
6) Good for fast debugging.