SOFTWARE DEFINITION

The sets of instructions, which control the sequence of operations, are known as programs, and these programs are collectively called software.

RELATIONSHIP BETWEEN SOFTWARE AND HARDWARE

- Software refers to the computer programs that are loaded into a computer system, and hardware refers to the visible devices. which are assembled together to build a computer system
- Even though hardware is the physical part of a computer, it is nothing unless it has software to control it.
- Software is a set of instructions that tells the hardware what to do and how to perform the requested action.
- If hardware is the 'heart' of a computer system, software is its 'soul'

SOFTWARE CATEGORIES

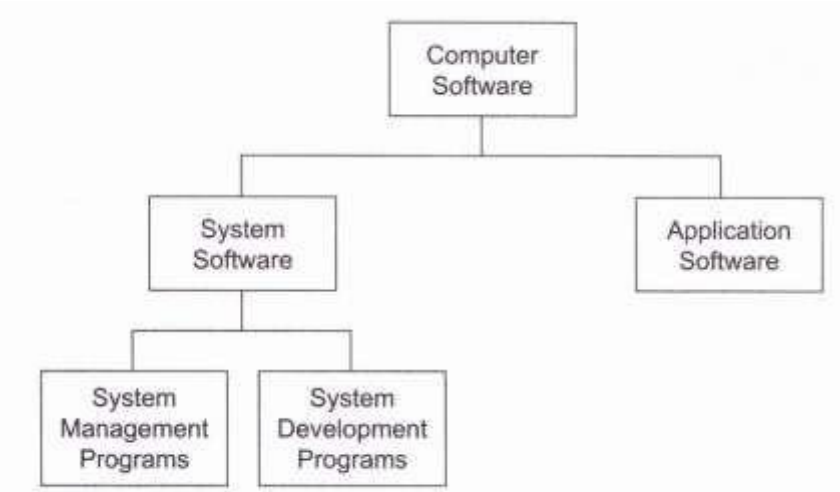

Figure Software Categories

Software can be divided into two major categories:

1. System Software
2. Application Software

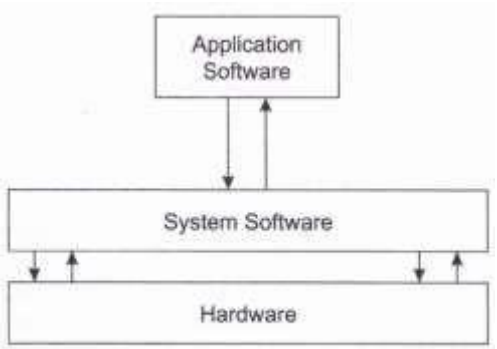

Figure System Software

System Software

- System software that provides the basic non-task-specific functions of the computer.
- System software is essential for a computer to function.
- System software consists of several programs which are directly responsible for controlling, integrating and managing the individual hardware component of computer system.
- The system software provides a programming environment in which programmers can create applications to fulfill their needs.
- System software acts as an interface between the hardware of the computer and the application software.

The system software can be further divided into two major categories

- System management programs
- System development programs

System Management Programs

- System management programs, as the name implies, are responsible for the management and accurate functioning of the computer system.
- It manages the operations of the processor, controls the input/output, manages storage resource.
- Examples of system management programs include the operating system, devicedrivers and system utilities as shown in the below fig.

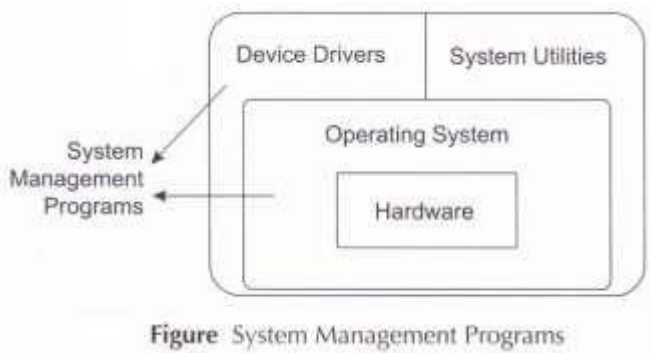

Figure System Management Programs

Operating System

It is the first software that is loaded into the computer memory, when the computer starts up.

It is responsible for performing common core services including disk access, memory management, task scheduling and user interfacing.

Basic functions of operating system are as follows:

- It handles creation , deletion and suspension of processes.
- It handles a location and de-allocation of memory space as required by many programs.
- It manages all the devices such as printers and modems. If any device fails it detects the device failure and notifies the same to the user.
- It provides an interface between user and the hardware.

Device Driver

A device driver is a system program, which is responsible for proper functioning the devices attached to the computer.

Whenever a new device is added to the computer a new device driver must also be installed before the device can be used.

System Utilities

It performs day-to-day tasks related to the maintenance of the computer system. Ex: Backup, Data Recovery, Virus protection, Disk management etc.

Backup – When data files get corrupted or accidentally deleted in such cases data backups become very useful.
Data recovery – sometimes, Disc drives or other hardwares may fail. During that time data recovery utilities are very helpful to recover the data.
Virus protection - antivirus programs are essential to remove any virus from the computer which can damage it.
Disc management - these programs include many system software like data compression, data defragmenter and disc formatting tools to help by reducing the large file size and file access time.

System Development Program

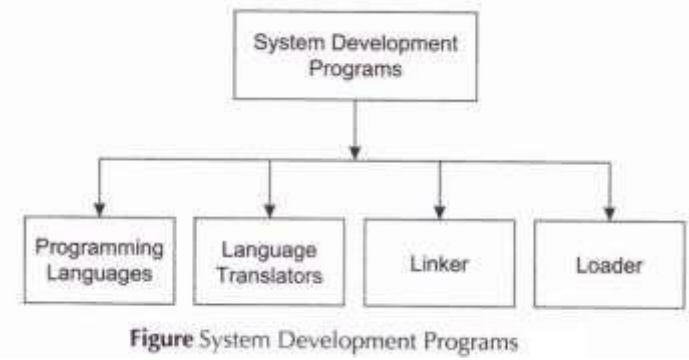

Figure System Development Programs

System development programs consist of system software, which are associated with the development of computer programs. These program development tools allow programmers to write and construct programs that the system can execute.

All the necessary tools required by the programmer, for example, programming-languages. Language translators, linker and loader.

Programming Language

- A programming language includes a series of commands, which are used in software development.
- Programming languages are further divided into three categories: **Machine language, assembly language and high-level language**

Language Translator

Language translators help in converting programming languages to machine language, that is, they convert programming statements into 0s and 1s that the computer is able to process. Language translators are divided into three major categories

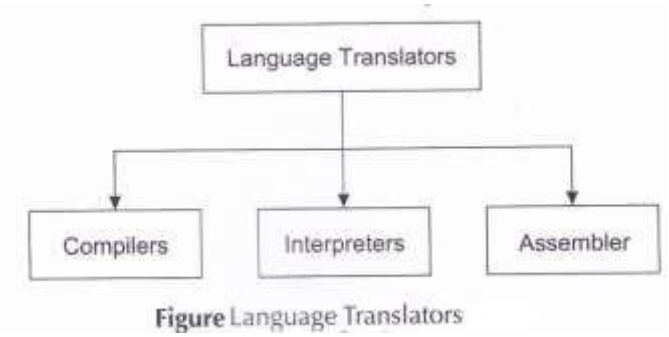

Figure Language Translators

Compiler

- A **compiler** translates source code (user-written program) into object code (binary form).
- The compiler looks at the entire piece of source code, recognizes the instruction and converts them into machine language

Interpreter
An interpreter analyses and executes the source code in a line by line manner without looking at the entire program.

Assembler
An assembler converts the assembly codes into machine codes, making the assembly program ready for execution

Linker
It links together several object modules and libraries to form a single and executable program.

Loader
It is responsible for loading and relocation of the executable program in the main memory.

Application Software

- Application software that is utilized by the users to accomplish specific task.
- Application software is the additional software that the users choose according to their needs.
- Application software is controlled by the system software
- This software may consist of a single program such as Microsoft's Notepad for writing and editing simple text.

Application software may be used for a variety of purposes:

- As a business tool.
- To assist with graphics and multimedia projects.
- To support home, personal and educational activities.
- To facilitate communications.
- As an aid in the entertainment industry.