Assignments - 25th – May-2022

1) Operating systems architecture?

: An operating system is a program that acts as an interface between a user of a computer and the computer resources. The purpose of an operating system is to provide an environment in which a user may execute programs.

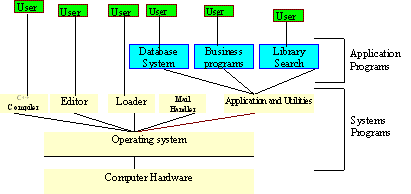
**General Architecture of an Operating System**

Operating systems architecture refers to the overall design of hardware and software components and their operational effectiveness as a whole.

To be effective, however, an operating system must not only be cognizant of the collection of hardware and software modules, but must also be designed in light of the programs and data which the system processes and the people which it serves.

The absence of formal theory on operating systems and the lack of standard terminology have caused much confusion among users.

The problem is particularly apparent when comparing systems where the same terms are applied to a variety of concepts and levels of implementation.



2)What is Linux Architecture?

: The Linux operating system's architecture mainly contains some of the components: the Kernel, System Library, Hardware layer, System, and Shell utility.

**Hardware**

The hardware consists of the memory, CPU, arithmetic-logic unit, various bulk storage devices, I/O, peripheral devices and other physical devices.

**Kernel**

In computing, the kernel is the central component of most computer operating systems; it is a bridge between applications and the actual data processing done at the hardware level.

**Shell**

A shell is a piece of software that provides an interface for users to an operating system which provides access to the services of a kernel.



1.**Kernel**: - The kernel is one of the core sections of an operating system. It is responsible for each of the major actions of the Linux OS.  This operating system contains distinct types of modules and cooperates with underlying hardware directly. The kernel facilitates required abstraction for hiding details of low-level hardware or application programs to the system. There are some of the important kernel types which are mentioned below:

* Monolithic Kernel
* Micro kernels
* Exo kernels
* Hybrid kernels

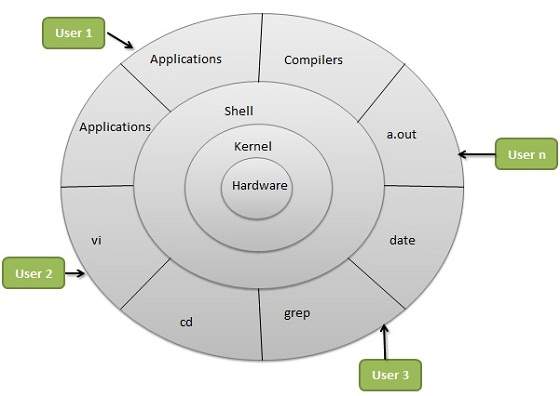
**2. System Libraries: -** These libraries can be specified as some special functions. These are applied for implementing the operating system's functionality and don't need code access rights of the modules of kernel.

**3. System Utility Programs: -** It is responsible for doing specialized level and individual activities.

**4. Hardware layer:-** Linux operating system contains a hardware layer that consists of several peripheral devices like [CPU](https://www.javatpoint.com/central-processing-unit), [HDD](https://www.javatpoint.com/hdd), and [RAM](https://www.javatpoint.com/ram).

**5. Shell: -** It is an interface among the kernel and user. It can afford the services of kernel. It can take commands through the user and runs the functions of the kernel. The shell is available in distinct types of OSes. These operating systems are categorized into two different types, which are the **graphical shells** and **command-line shells**.

The graphical line shells facilitate the graphical user interface, while the command line shells facilitate the command line interface. Thus, both of these shells implement operations. However, the graphical user interface shells work slower as compared to the command-line interface shells.



3) What is a computer system BIOS?

: As your PC's most important start up program, BIOS, or Basic Input/Output System, is the built-in core processor software responsible for booting up your system.

Typically embedded into your computer as a motherboard chip, the BIOS functions as a catalyst for PC functionality action.

OR

In computing, BIOS is firmware used to provide runtime services for operating systems and programs and to perform hardware initialization during the booting process.

The BIOS firmware comes pre-installed on an IBM PC or IBM PC compatible's system board and exists in UEFI-based systems too.

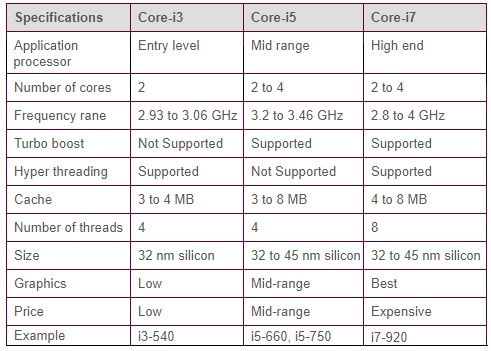
4)Difference between 13-bit o.s and 64-bit o.s?

* As its name suggests, the 32-bit OS can store and handle lesser data than the 64-bit OS.
* More specifically, it addresses a maximum of 4,294,967,296 bytes (4 GB) of RAM.
* The 64-bit OS, on the other hand, can handle more data than the 32-bit OS.
* When it comes to computers, the difference between 32-bit and a 64-bit is all about processing power.
* Computers with 32-bit processors are older, slower, and less secure, while a 64-bit processor is newer, faster, and more secure.

5)What are the difference between i3 i5 and i7?

* Core i3 processors have two cores
* Core i5 CPUs have four and Core
* i7 models also have four.
* Some Core i7 Extreme processors have six or eight cores.

Generally speaking, we find that most applications can't take full advantage of six or eight cores, so the performance boost from extra cores isn't as great.



6)What is an OS interrupt driven?

* interrupt-driven Denoting a process that is restarted by the occurrence of an interrupt.
* Interrupts are important because they give the user better control over the computer.
* Without interrupts, a user may have to wait for a given application to have a higher priority over the CPU to be ran. This ensures that the CPU will deal with the process immediately.

WORKING:

Interrupt driven I/O is an alternative scheme dealing with I/O.

Interrupt I/O is a way of controlling input/output activity whereby a peripheral or terminal that needs to make or receive a data transfer sends a signal.

This will cause a program interrupt to be set.

7)What is Interrupt handling?

* Interrupt handling is a key function in real-time software, and comprises interrupts and their handlers.
* Only those physical interrupts which of high enough priority can be cantered into system interrupt table.
* The software assigns each interrupt to a handler in the interrupt table.

8)What are the function of interrupt?

: Interrupts are commonly used to service hardware timers, transfer data to and from storage (e.g., disk I/O) and communication interfaces (e.g., UART, Ethernet), handle keyboard and mouse events, and to respond to any other time-sensitive events as required by the application system.

OR

Role of Interrupts. Interrupts are signals sent to the CPU by external devices, normally I/O devices

. They tell the CPU to stop its current activities and execute the appropriate part of the operating system.