**Operating system:**

Operating system is a system software which is used as a interface between end-user and hardware.

Operating system is a special type of system which give us convenience way to communicate with hardware.

It also gives the platform for running the software.

Operating system is also called as a resource manager

Which means when multiple user access the hardware at a time then it shares the resources.

The operating system has functionality

* process management
* Memory management
* process scheduling
* File Management
* Security
* Networking

OS is responsible to start, stop, or execute the Process when any process is start then firstly it comes into the RAM, and after that the process is going to the registers that is after execute by microprocessor.

**Ex:**

Everything which we running on the computer that is executed through the operating system.

**Kernel:**

Kernel is the core component of operating system that is responsible for managing the hardware. It is the program that allocate, deallocate the memory, or also managing multiprocessing, IO management, CPU scheduling.

We usually don’t interact with the kernel because it deals with the low-level operation so that’s why it is much more complex to interact with kernel. But some users or application use the System-Call, shell or API to interact with the kernel.

**Note:**

Hardware only execute one instruction at a one clock cycle.

**Process:**

the software in execution is called process.

**Thread:**

**Multi-programmed Operating system:**

Multi-programmed OS is a type of operating system in which we load multiple processes in the RAM. CPU executes the one process complete until the process does not want any IO operation.

and then CPU switches to another process by completing the previous execution.

**Note:**

Multi-programmed aik operating system ha jo multiple process ko load krta ha main memory ma.

or cpu run krta ha aik process ko completey to us ka bd dusra ko execute krta. Agar process khud interrupt karega tu microprocessor kisi dusra processor ko mooga dega.

Is ma microprocessor free nhi bethta hum maximum use krta ha microprocessor ka.

**Multi-Tasking operating system:**

Multi-tasking is a type of OS in which we execute the process concurrently. And CPU is rapidly switched to another process.

In which cpu give the some-time to every process.