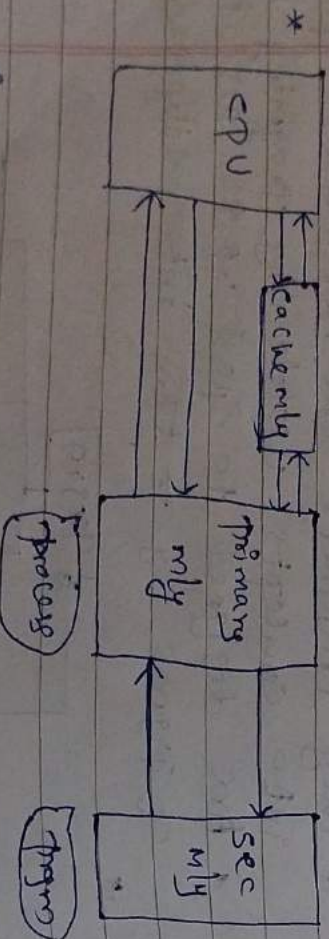


Process Management

⇒ process:

- * process is basically a program in execution.
- * The execution of a process must progress in a sequential fashion.
- * It is defined as an entity which represents the basic unit of work to be implemented in the system.
- * we write our programs in a text file i.e. we execute this program, it becomes a process which performs all the tasks mentioned in the program.



* When program store in memory, it is called as program. When we execute the program, it becomes a process. The process is the basic unit of work to be implemented in the system. The process is the basic unit of work to be implemented in the system. The process is the basic unit of work to be implemented in the system.

(P) → process

Process Control Block (PCB):

- * It is a data structure maintained by the OS for every process.
- * PCB is identified by an integer process ID (PID).

* Fig:

PCB pointer
process ID
priority
process state
process status register
Register
Event info
I/O status
Accounting info.

- process state: current state of the (P)
- program counter: points to the address of next instruction to be executed.
- process ID: unique identifier for each of the (P) in the OS.
- I/O status info: list of I/O devices allocated to the (P).
- CPU registers

II op^r on process:

1) Creation:

- Initial 8th of the (p) execution activity.
- It means the construction of a new process for execution.
- once the (p) is created, it will be ready & come into the ready queue (mainly) & will be ready for the execution.

2) Scheduling:

- out of many (p) presnt in the ready queue, the OS chooses 1 process & start executing it.
- selecting the process which is to be executed next \rightarrow scheduling.

3) Blocking:

- Block mode is basically a mode where the process waits for I/O-op.
- The OS blocks the (p) & dispatches another (p) to the processor.

4) Termination:

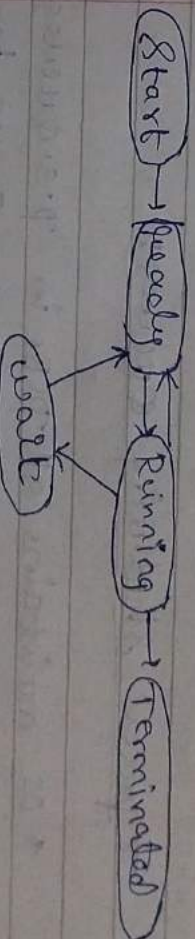
- It is the activity of ending the (p).

III process states:

- It is the relaxation of comp resources taken by the (p) for execution.

* when a (p) executes, it passes through diff 8ths.

* In general, a (p) can have 1 of the following 5 states at a time.



• Start: Initial 8th when a (p) is created.

• Ready: The (p) is waiting to be assigned to a processor. (p) may come into this state after start state.

• Running: Once the (p) has been assigned to a processor by the OS scheduler, the (p) state is set to running & the processor executes its instr.

• waiting: process moves into waiting state if it needs to wait for a resource. Like waiting for user I/O.

- Terminated / exit: once the (P) finishes its execution or it is terminated by OS.

IV Process scheduling:

- * It is the activity of the process manager that handles the removal of the running (P) from the CPU.
- * It is an essential part of multi programming OS.

→ Process scheduling queues:

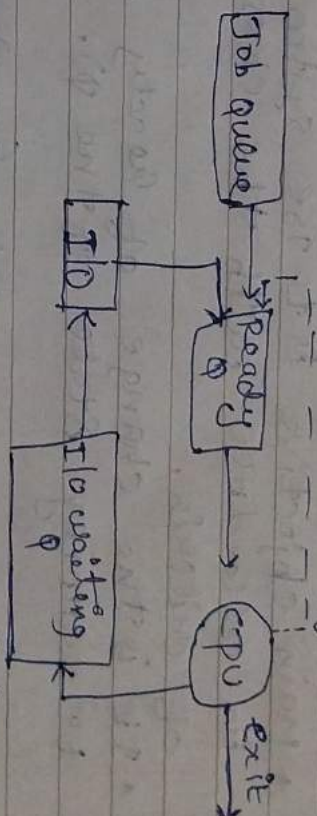
- * OS maintains all PCBs in P.S. Queues.
- * OS maintains a separate queue for each of the process states & PCBs of all (P)s in the same execution state are placed in the same queue.
- * 3 types —

1) Job queue: This queue keeps all the (P) in the system.

2) Ready queue: keeps a set of all (P) residing in main mly, ready & waiting to execute. A new (P) is always put in this queue.

3) Device queue: The (P)s which are blocked

due to unavailability of an I/O device constitute this queue.



The OS can use different policies to manage each queue (FIFO, Round Robin, priority, etc).

→ Schedulers:

- * Are spile system software which handles (P) scheduling in various ways.
- * Their main task is to select the jobs to be submitted into the system & to decide which process to run.
- * 3 types —

1) Long Term Schedulers (LTS):

- Also → job schedulers
- Determines which prgs are admitted to the system for processing.
- It selects (P) from the queue & loads them into mly for execution.