# 1.Process Scheduling Cheat Sheet

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## Scheduling Queue

**Job Queue:** A process when enters a system is put into a *job queue.*

**Ready Queue:** The process residing in the main memory and ready for execution is put into *ready queue.*

**Device Queue:** The process waiting for a particular I/O device is put in the *device queue.*

## Scheduler

**Long Term Scheduler:** Also known as *job scheduler* selects process from disk and puts into the main memory.

**Short Term Scheduler:** Also known as *CPU Scheduler* selects process from memory and allocates a CPU to it.

**Medium-Term Scheduler:** It is used to remove a process and reduce the degree of multi-programing . Later it can be re-introduced from point where it was left .This is known as *Swapping*.

## Priority Scheduling Round Robin Scheduling

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|---|---|
| Each process has a *priority*. | There is a fixed *time quantum*. |
| CPU allocated to the process with higher priority. | Ready queue is treated as *circular queue* and CPU is allocated to the First process for specific time quantum. |
| **Problem:** *Starvation* of low priority. **Solution:** *Aging*. | **Problem:** If time quantum too large, algorithm works as FCFS. |
| It can be *preemptive* or *non-preemptive.* | It is *preemptive.* |

## Multilevel Queue Multilevel Feedback Queue

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|---|---|
| Ready queue is divided into: *Foreground (interactive) process* and *Background (batch) process.* | Allows the process from one queue to move to the next queue. |
| **Foreground** implements *Round Robin Scheduling* and **Background** implements *FCFS.* | Here processes are separated according to their CPU burst. |

## Scheduling Criteria

**1. CPU Utilization:** It should be *maximum*. 40% minimum- 90% maximum.

**2. Throughput:** Number of processes completed per unit time is called *throughput.* It should be *minimum.*

**3. Turnaround Time:** The interval from time of submission of process to time of completion, *Turnaround Time= period spent waiting + waiting in ready queue + execution time + I/O interrupt time.* It should be *minimum.*

**4. Waiting Time:** The time for which the process has to wait in the ready queue is *waiting time.* It should be *minimum*.

**5. Response Time:** Time taken to respond to a process is a *response time*. It should be *minimum.*

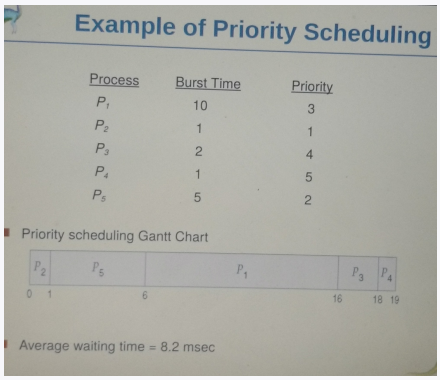
## SCHEDULING ALGORITHM

Scheduling Algorithm decides which process should the CPU be allocated to. There are *six scheduling algorithms*.

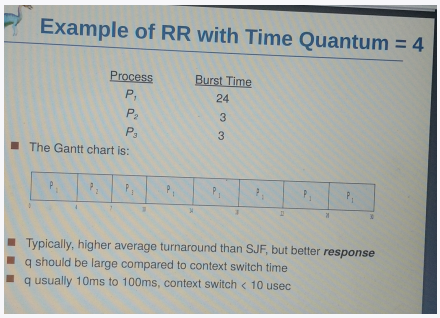
## First Come First Serve Shortest Job First

| | |
|---|---|
| The process that requests for the CPU first, gets the access first. | Each process has the length of the next CPU burst. |
| FIFO queue is used in handling the process. | The process with smallest next CPU burst gets access to the process. |
| Long waiting time for the next process. | Comparitively less waiting time for the next process. |
| It is a *non-preemptive* algorithm. | It can be *preemptive* or *non-preemptive.* |

## Priority Scheduling Diagram




## Round Robin Diagram





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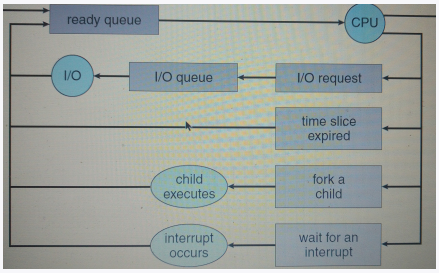
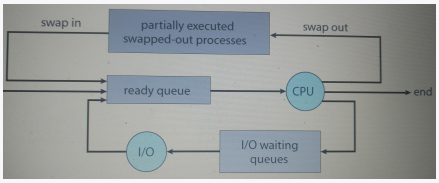
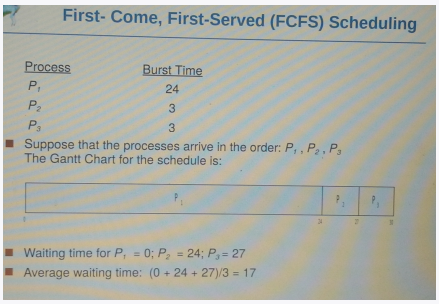
## Scheduling Queue Diagram



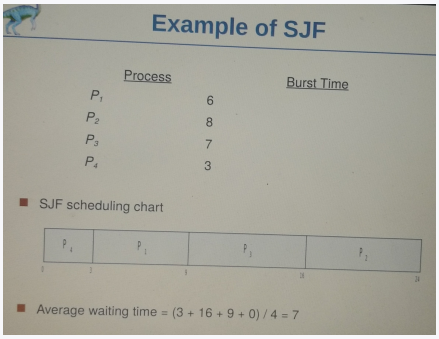

## Medim-Term Scheduling Diagram



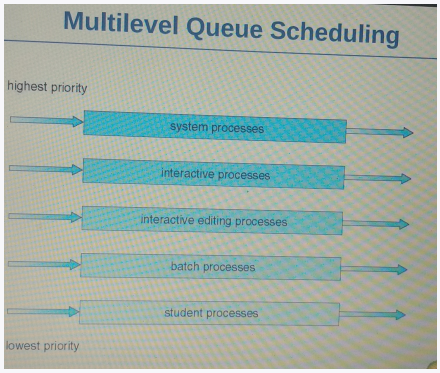

## First Come First Serve (FCFS) Diagram




## Shortest Job First (SJF) Diagram




## Multilevel Queue Scheduling Diagram




## Multilevel Feedback Queue Diagram