# 8. Job Scheduling Algorithm

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Assignment C-1

Aim – Implement Job scheduling algorithm
1) FCFS
2) shortest Job First
3) Priority
4) Round Robin.

Problem statement - write a java program
to implement following scheduling algorithm
FCFS, STF, Priority and Round Robin.

Theory:
Proble Explanation:
CPU scheduling deals with the problem of
deciding which of the processes is already
queue is to be allowed Utilize CPU.
1) maximum throughput.
2) least turnaround time.
3) minimum waiting time.
4) maximum CPU Utilization.
5) Also the variance in response time
must be minimum. In preemptive job.
executing Job can be remove and a

a new job can take its place, however
in Non-preemptive this is not possible.

1) FIRST COME FIRST SERVE.
   This is simplest cpu scheduling algorithms
   . The process that request cpu first, is the
   one which it is allocated first.
   Implementation
   1) Input the processes along with their
      burnt time.
   2) Find waiting time (wt) for all processes
   3) As first processes that comes need not
      to wait so waiting time for processes
      t will be 0 i.e wt[0]=0
   4) Find waiting time for all other processe
      process i -->
      $$wt[i] = bt[i-1] + wt[i-1]$$
   5) Find turnaround time = wt + bt.
      for all processes.
   6) Find average waiting time =
      total waiting time / no. of processes.
   7) Simillary, find average turnaround
      time = total turn-around time
      / no. of processes.

## FCFS (Example)

| processes | Duration | Oder | Arrival time |
|-----------|----------|------|--------------|
| P1 | 24 | 1 | 0 |
| P2 | 3 | 2 | 0 |
| P3 | 4 | 3 | 0 |

Gontt chart :

| P1 (24) | P2(3) | P3(4) |
|---------|-------|-------|
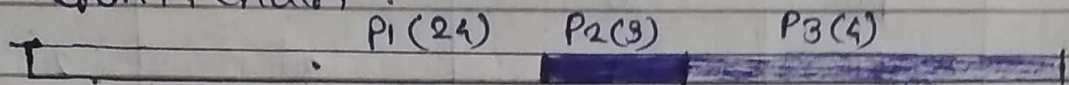
I P1 waiting time : 0

P2 waiting time : 24    Avg waiting time

P3 waiting time : 27    : (0+24+27)/3 = 17
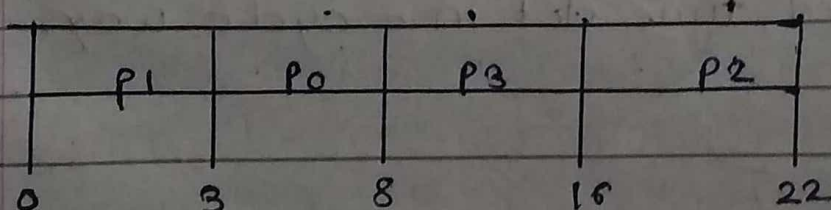
2) SHORTEST JOB FIRST :-

This algorithm associated with it the length
of the next cpu burst.

Algorithm.

1 - sort all the processes in increasing order
     according to burst time:
2 - Then simply, apply FCFS.
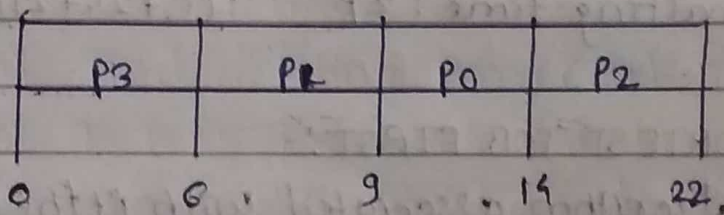
| Process | Arrival time | Execute time | Service time |
|---------|--------------|--------------|--------------|
| P0 | 0 | 5 | 0 |
| P1 | 1 | 3 | 3 |
| P2 | 2 | 8 | 8 |
| P3 | 3 | 6 | 16 |

| P1 | P0 | P3 | P2 |
|----|----|----|----|

0    3    8    16    22

## 3) PRIORTTY BASEO SCHEOULING:

- Priority scheduling is a non-preemptive
- algorithms and one of the most common
  scheduling algorithm in batch system.

| process | Arrival time | Execute time | Priority | Service |
|---------|--------------|--------------|----------|---------|
| po | 0 | 5 | 1 | 9 |
| PI | 1 | 3 | 2 | 6 |
| P2 | 2 | 8 | 1 | 14 |
| P3 | 3 | 6 | 3 | 0 |

| P3 | PE | Po | P2 |
|----|----|----|----|

0    6    9    14    22

Implementation :

1 - First input the processes with their
   burst time and priority.

2 - sort the processes, burst time and priority
   according to the priority.

3 - Now simply apply FCFS algorithm.

## 4) ROUND ROBINSCHEDULING.

- Round Robin is a CPU scheduling algori-
  thms where each process is assigned
  a fixed time slot in a cyclic way.

- It is simple, easy to implement, and starvation-free all processes get fair share of CPU.
- one of the most commonly used technique in CPU schedulings as a core.
- Context switching is used to save states of preempted processes.

| P0 | P1 | P2 | P3 | P0 | P2 | P3 | P2 |
|----|----|----|----|----|----|----|----|

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0    3    6    9    12   14   17   20   22.
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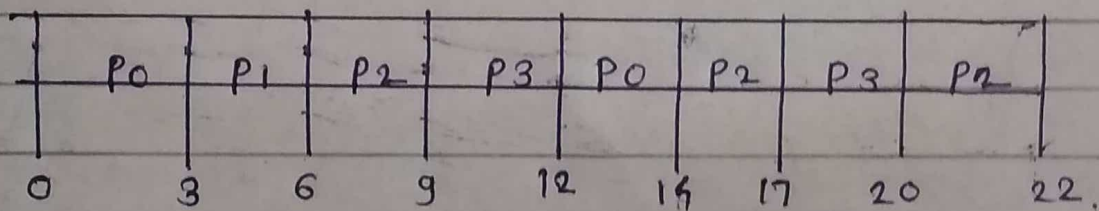
Round Robin Examples:-

| Process | Duration | Order | Arrival time |
|---------|----------|-------|--------------|
| P1 | 3 | 1 | 0 |
| P2 | 4 | 2 | 0 |
| P3 | 3 | 3 | 0 |

Suppose time quantum is 1 unit.

| P1 | P2 | P3 | P1 | P2 | P3 | P1 | P2 | P3 | P2 |
|----|----|----|----|----|----|----|----|----|----|
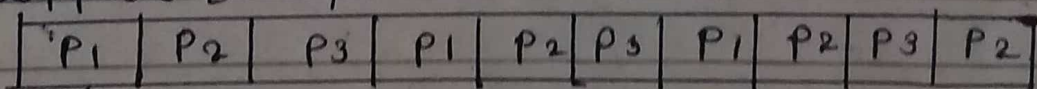
P1 waiting time : 4

P2 waiting time : 6.    Avg.(AWT) = 5.33.

P3 waiting time : 6.