Assignment 8.

Q1 Difference between preemptive

	Preemptive scheduling	Non preemptive scheduling
1)	CPU Allocation is not constant	CPU Allocation is constant
2)	process can be intreupted at any time	Process will not be intrupted by any other process.
3)	In this scheduling has a lot of overhead because of scheduling.	In this their only happens a switching when the process close I/O operations.
4)	Their can be problem of staruation in this	staruation problem will not happen.
5)	If high priority process comes then the running process is switched out	In this even if a critical process comes the running process will not be preempted
6)	In this the responce time can be reduced or minimal	In this responce time is meany times it is higher

Q2 Which of the following scheduling algorithms could result in starvation?

a. First-come, first-serve
b. Shortest job first
c. Round robin
d. Priority

→ - starvation is the process in which a process is waiting in ready queue for a long time.

- This can happen in scheduling Algorithms like
  - Shortest job First
  - priority scheduling.

1) shortest job first.

- in this scheduling the job having the shortest burst time is given cpu time.

- in preemptive SJF whenever their is a process running and another even shorter process comes then running process is switched out.

- If their comes a situation where two processes have same Burst time then we use FCFS between them.

Starvation can happen in this situation if constant stream of process having low priority come in cpu.

d) priority scheduling.

→ - in this the processes are scheduled by their priority value

- processes having high priority are given CPU time before CPU's with low priority.

- starvation can happen if processes having low priority constantly keep appearing.

Q3 Suppose that the following processes arive for execuation at the times indicated. each process will run for an amount time listed In answering the questions use non preempt-ive scheduling and base all the decisions on the information you have at the time design must be maid.

a) what is the average turnaround time for these processes.

process	Arrival time	Burst time
P_1	0.0	8
P_2	0.4	4
P_3	1.0	1

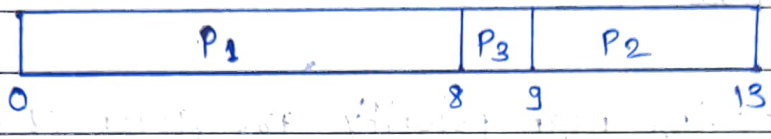
→

average turnaround time

$= (8+12+13)/3 \quad = 24.33$

b) what is the average turnaround time for those process with SJF algorithm.

→

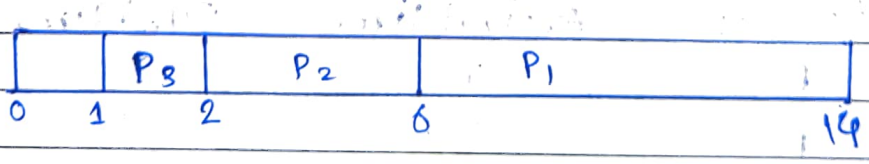


Average turnaround time

$= (8+9+13)/3$

$= 24.33$

c) The SJF algorithm suppose to increase performance but notice that we choose to run process 1 at time 0 because we didnot know other shorter processes may arive soon. compute what the average turnaround time will be if the CPU is left ideal for the first 1 unit and then SJF is used. remember that process p_1 and p_2 are waiting in that ideal time, so their waiting time may increase this algorothem could be called future knowladge scheduling.



Average ~~wo~~ turnaround time

$= (1+6+14)/3$

$= 11.66$

Q4 Consider the following set of processes, with the length of the CPU Burst given in miliseconds.

Process	Burst Time	priority.
P_1	2	2
P_2	1	1
P_3	8	4
P_4	4	2
P_5	5	3

The processes are assumed to have arived in the order P_1, P_2, P_3, P_4, P_5, all at time 0.

a) Draw four Gantt charts that illustrate the execuation of these process using the following scheduling algorithms. FCFS, SJF, nonpreemptive priority and RR (quantom = 2)

I) FCFS

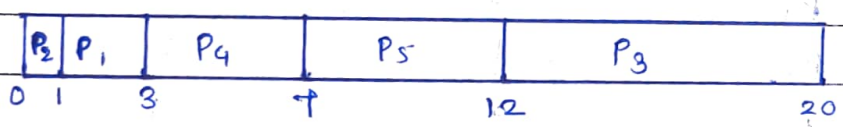
→ order of execuation

- P_1, P_2, P_3, P_4, P_5

II) SJF

Process execution order.

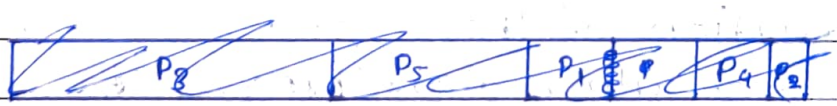
- P_2, P_1, P_4, P_5, P_3

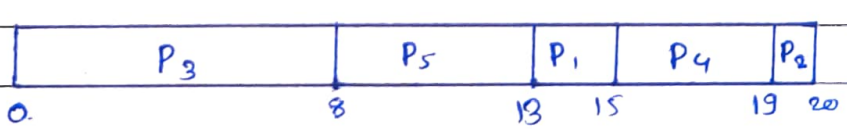


III) non preemptive priority.

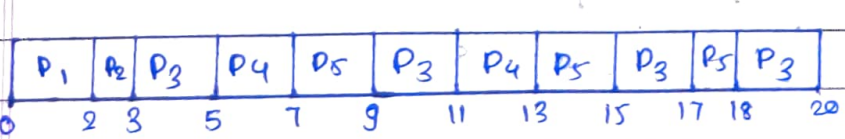
Process execution order.

- P_3, P_5, P_1, P_4, P_2





VI) RR (quantom = 2)



Turnaround time = Completion time - Arrival time
waiting time = turnaround time - Burst time

b) what is the turnaround time for each process for each of the scheduling algorithms in part a.

I) turn around time in FCFS

- $P_1 = 2$
- $P_2 = 3$
- $P_3 = 11$
- $P_4 = 15$
- $P_5 = 20$

II) turnaround time for SJF

$P_1 = 3$
$P_2 = 1$
$P_3 = 20$
$P_4 = 7$
$P_5 = 12$

III) turnaround time for non-preemptive priority.

$P_1 = 15$
$P_2 = 20$
$P_3 = 8$
$P_4 = 19$
$P_5 = 13$

VI) RR turnaround time.

$P_1 = 2$
$P_2 = 3$
$P_3 = 20$
$P_4 = 13$
$P_5 = 18$

c) what is the waiting time for each process for each scheduling algorithms.

- waiting time for each algorithm is as follows

I) FCFS

$P_1 = 0$
$P_2 = 2$
$P_3 = 3$
$P_4 = 11$
$P_5 = 15$

II) SJF

$P_1 = 1$
$P_2 = 0$
$P_3 = 12$
$P_4 = 3$
$P_5 = 7$

III) non-preemptive priority.

$P_1 = 13$
$P_2 = 19$
$P_3 = 0$
$P_4 = 15$
$P_5 = 8$

VI) RR

$P_1 = 0$
$P_2 = 2$
$P_3 = 12$
$P_4 = 9$
$P_5 = 13$

d) which of the algorithms results in the minium average waiting time.

- average waiting time for all angeorithms is as follows

I) FCFS
- (0+2+3+11+18) / 5 = 10.3

II) SJF
- (11+0+12+3+7) / 5 = 07.6

III) non-preemptive priority.
- (13+19+0+15+8) / 5 = 18.3

VI) RR
- (0+2+12+9+13) / 5 -

I) FCFS

- (0+2+8+11+15)/5 = 6.2

II) SJF

- (1+0+12+3+7)/5 = 4.6

III) non-preemptive priority

- (13+19+0+15+8)/5 = 11

VI) RR

-(2+12+9+13)/5 = 7.2

therefore the least waiting time is of algorithm shortest job first (SJF)