Course : Operating Systems **Instructor:** 黃能富

Student name: Tuguldur Tserenbaljir **Assignment:** Assignment 2

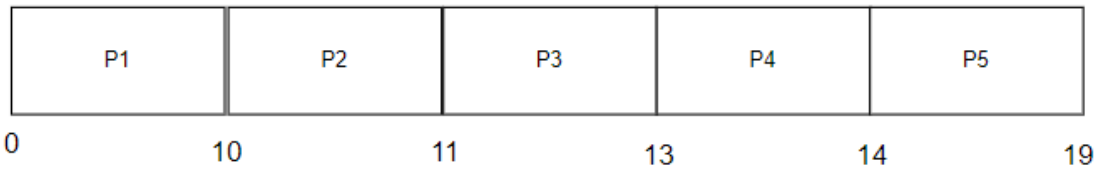
Student ID: 109006271

5.13

a) Gantt charts

a1) First Come First Serve (FCFS)

P_1, P_2, P_3, P_4, P_5



b1) Turnaround time=>

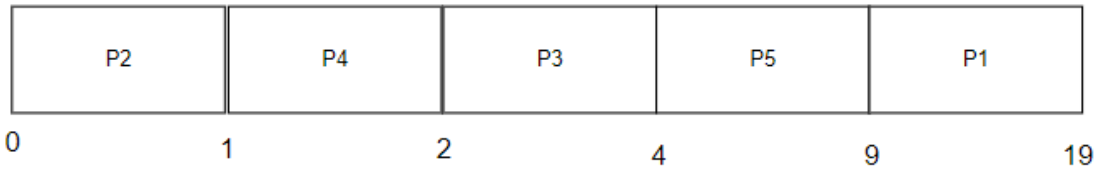
P1 = 10, P2 = 11, P3 = 13, P4 = 14, P5 = 19

c1) Waiting Time=> turnaround time - burst time

P1 = 0, P2 = 10, P3 = 11, P4 = 13, P5 = 14 ,total =48

a2) Shortest Job First(SJF)

P_2, P_4, P_3, P_5, P_1



b2) Turnaround time=>

P1 = 19, P2 = 1, P3 = 4, P4 = 2, P5 = 9

c2) Waiting Time=> turnaround time - burst time

P1 = 9, P2 = 0, P3 = 2, P4 = 1, P5 = 4 ,total =16

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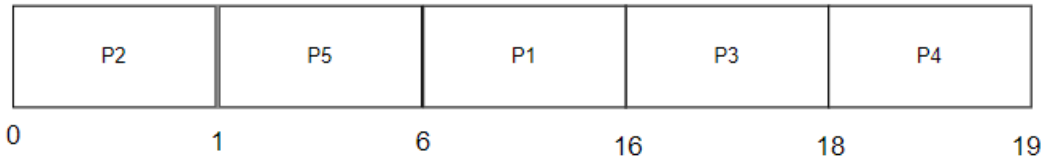
a3) Nonpreemptive priority (using FCFS)

P_2,P_5,P_1,P_3,P_4



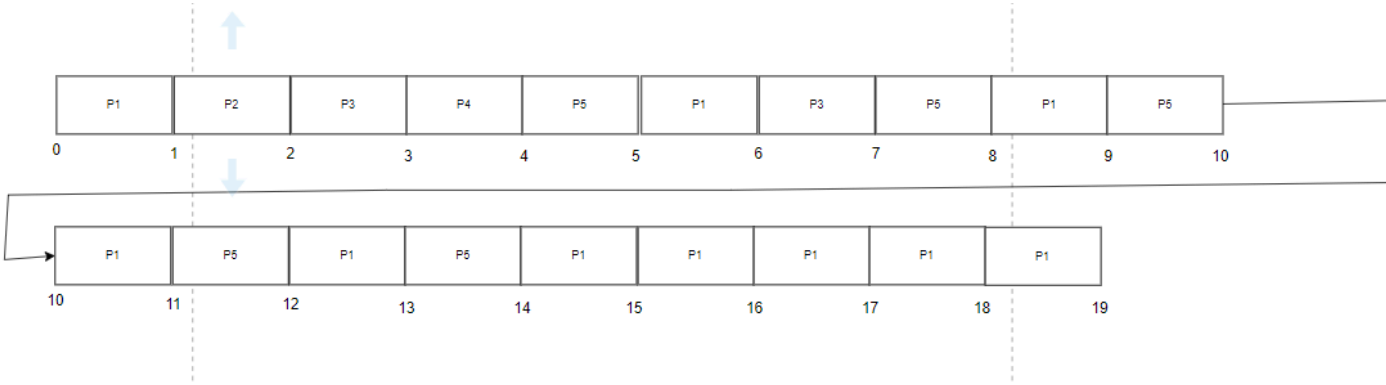
b3) Turnaround time=>

P1 = 16, P2 = 1, P3 = 18, P4 = 19, P5 = 6

c3) Waiting Time=> turnaround time - burst time

P1 = 6, P2 = 0, P3 = 16, P4 = 18, P5 = 1 ,total = 41

a4) Round Robin (RR, quantum = 1)



b4) Turnaround time=>

P1 = 19, P2 = 2, P3 = 7, P4 = 4, P5 = 14

c4) Waiting Time=> turnaround time - burst time

P1 = 9, P2 = 1, P3 = 5, P4 = 3, P5 = 9 ,total =27

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d) Mininuim of waiting time total/ num of P (5)

FCFS => 48/5 = 9.6

SJF => 16/5 = 3.2

Nonpreemptive priority=> 41/5 = 8.2

RR=> 27/5= 5.4

SJF has the minimum waiting time of 3.2

5.16)

a) FCFS (First Come First Serve)

When b>a>0 , the priority of a process increases faster while it waits in the ready queue than while it runs. Consequently, processes with shorter waiting times obtain higher priorities, encouraging the scheduler to execute shorter processes first. This algorithm is similar to FCFS.

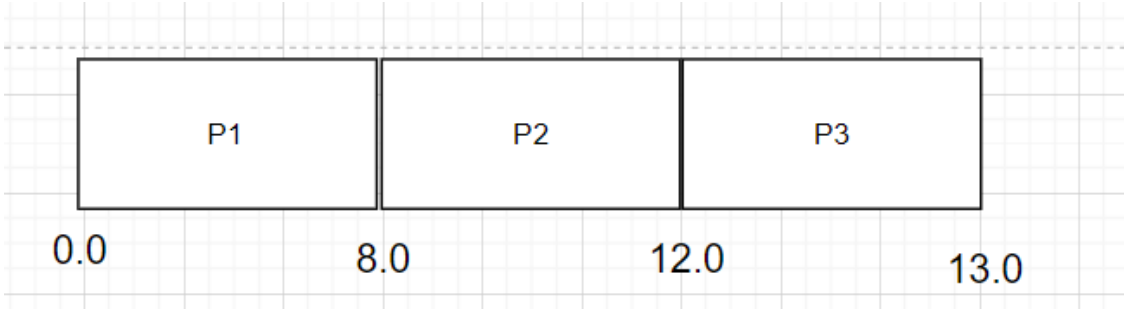
b) LIFO (Last In First Out)

When a<b<0, the priority of a process decreases faster while it waits in the ready queue than while it runs. As a result, processes with longer waiting times acquire higher priorities, prompting the scheduler to execute longer processes first. This algorithm is similar to LIFO.

5.17)

a) Average Turn around time = sum of turn around time/n (num of P, n=3)

FCFS



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Turn around time = finishing time - arriving time

$TT_1 = 8 - 0 = 8.0$

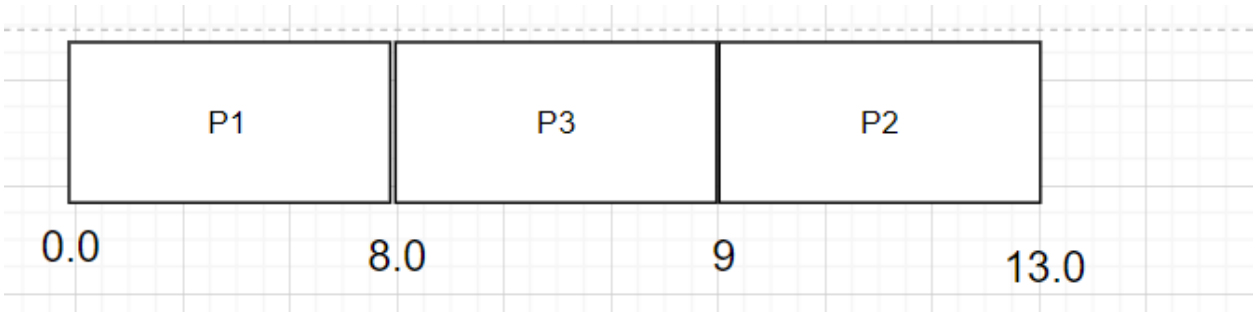
$TT_2 = 12 - 0.4 = 11.6$

$TT_3 = 13 - 1.0 = 12.0$

Average Turn around time => (8.0 + 11.6 + 12)/ 3= 10.53 (using the first formula)

b) Use same formula as in part a but Gantt charts and turn around time different

SJF



Turn around time = finishing time - arriving time

$TT_1 = 8 - 0 = 8.0$

$TT_2 = 13 - 0.4 = 12.6$

$TT_3 = 9 - 1 = 9.0$

Average Turn around time => (8.0 + 12.6 + 8.0)/ 3= 9.53 (using the first formula)

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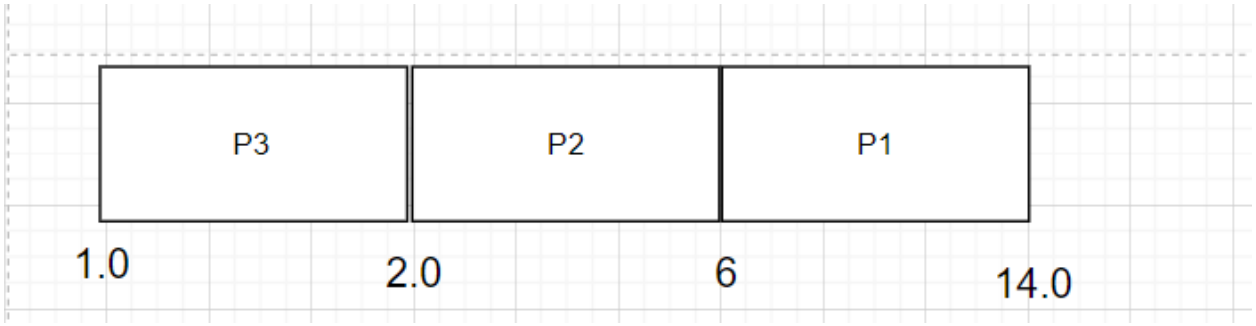
c) Future-Knowledge Scheduling



Turn around time = finishing time - arriving time

$TT_1 = 14 - 0 = 14.0$

$TT_2 = 6 - 0.4 = 5.6$

$TT_3 = 2 - 1 = 1.0$

Average Turn around time => (14 + 5.6 + 1.0)/ 3= 6.67 (using the first formula in part a)