Department of Computer Science and Engineering

FACULTY OF ENGINEERING AND TECHNOLOGY
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CS-501

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PRIORITY SCHEDULING

Priority Scheduling

- A *priority* number (integer) is associated with each process
- The CPU is allocated to the process with the highest priority (*smallest integer => highest priority*)
  - Preemptive
  - Non-preemptive
- SJF is a priority scheduling where priority is the predicted next CPU burst time
- Problem : Starvation – low priority processes may never execute
- Solution : Aging – as time progresses increase the priority of the process

Priority Scheduling Question

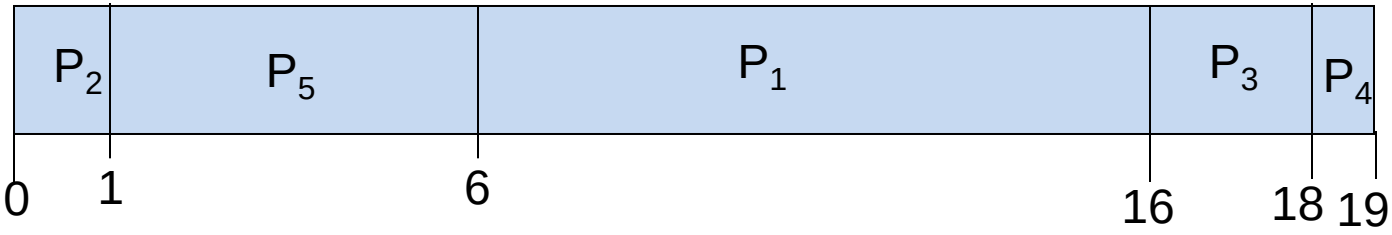
Process	Arrival Time	Burst Time	Priority
P_1	0	10	3
P_2	0	1	1
P_3	0	2	4
P_4	0	1	5
P_5	0	5	2

Suppose that the processes arrive in the order: P_1 , P_2 , P_3 , P_4, *and* P_5.

Find:

1. *Waiting Time*
2. *Average Waiting Time*
3. *Turnaround Time*
4. *Average Turnaround Time*

Priority Scheduling Question: Solution 1/2

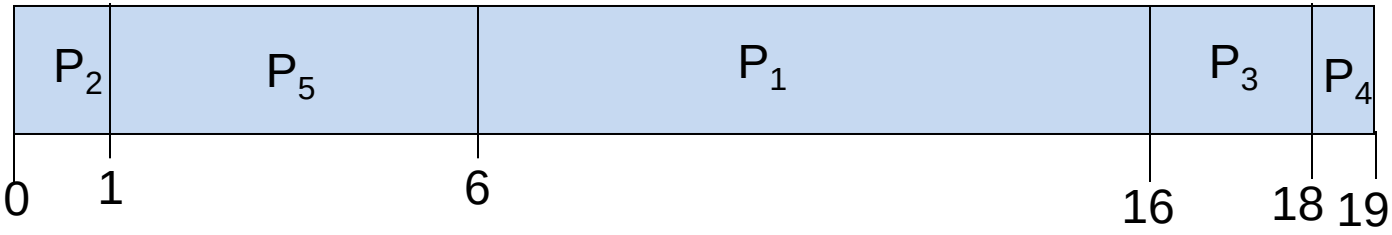


- *Waiting Time*
  - *P1wt=(6-0)=6 unit time*
  - *P2wt=0 unit time*
  - *P3wt=(16-0)=16 unit time*
  - *P4wt=(18-0)=18 unit time*
  - *P5wt=(1-0)=1 unit time*

Process	Arrival Time	Burst Time	Priority
P_1	0	10	3
P_2	0	1	1
P_3	0	2	4
P_4	0	1	5
P_5	0	5	2

- *Average Waiting Time*
  - *AWT=(P1wt+P2wt+P3wt+P4wt+P5wt)/5*
  - *AWT=(6+0+16+18+1)/5=41/5=8.2 unit time*

Priority Scheduling Question: Solution 2/2



- *Turnaround Time*
  - *P1tt=(16-0)=16 unit time*
  - *P2tt=(1-0)=1 unit time*
  - *P3tt=(18-0)=18 unit time*
  - *P4tt=(19-0)=19 unit time*
  - *P5tt=(6-0)=6 unit time*

Process	Arrival Time	Burst Time	Priority
P_1	0	10	3
P_2	0	1	1
P_3	0	2	4
P_4	0	1	5
P_5	0	5	2

- *Average Turnaround Time*
  - *ATT=(P1tt+P2tt+P3tt+P4tt+P5tt)/5*
  - *ATT=(16+1+18+19+6)/5=60/5=12 unit time*

Priority Scheduling Homework Question

Process	Arrival Time	Burst Time	Priority
P_1	0	6	2
P_2	0	3	4
P_3	0	8	3
P_4	0	2	1

Suppose that the processes arrive in the order: P_1 , P_2 , P_3, *and* P_4

Find:

1. *Waiting Time*
2. *Average Waiting Time*
3. *Turnaround Time*
4. *Average Turnaround Time*

References

1. Silberschatz, Galvin and Gagne, “Operating Systems Concepts”, Wiley.

2. William Stallings, “Operating Systems: Internals and Design Principles”, 6th Edition, Pearson Education.

3. D M Dhamdhere, “Operating Systems: A Concept based Approach”, 2nd Edition, TMH.

Thank You.