Exercise Sheet 3. Scheduling (P&P)

Overview

Process	Arrival Time	Service Time	Priority
A	0	7	2
B	3	3	1
C	4	2	3
D	6	5	2
E	8	2	3

For each task in this exercise:

- create a GANTT chart describing how these processes are assigned to the CPU according to the given scheduling algorithms, and
- compute the average *turnaround time* and *response time* for each of these cases.

Turnaround time is the number of timesteps it takes for a process to be complete. So that's from the time it arrives to the time it finishes running.

Response time, or **latency**, is the time it takes for the scheduler to schedule the process, after it has arrived. So the time from arrival to the first execution of the process.
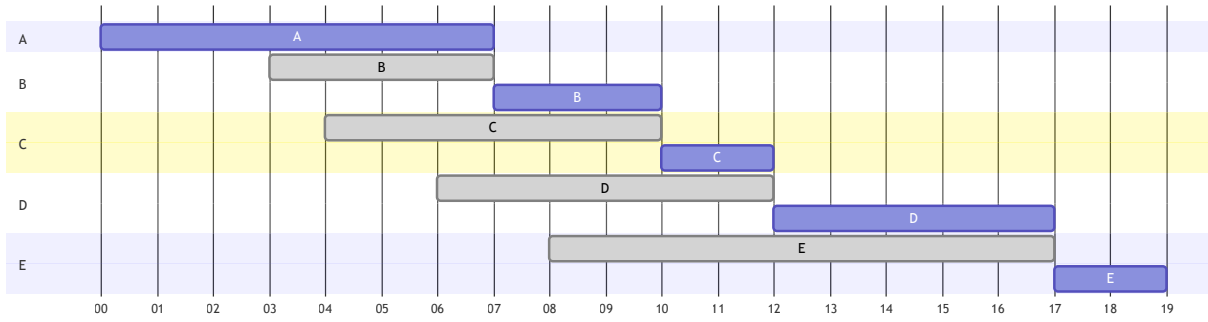
Note that when a process is preempted, **it is always inserted to the back of the queue**, after any processes that might have arrived in the meantime, or even at the same time the preemption happens.

Note that a **higher number means higher priority**
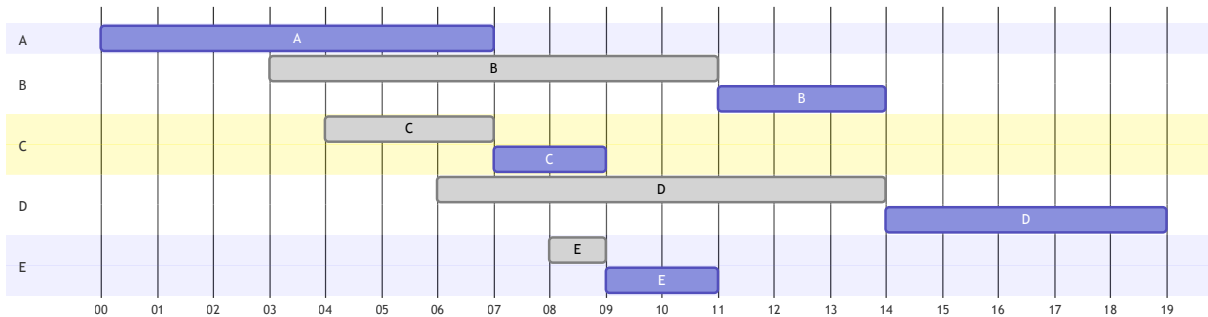(i.e., NOT niceness).

Task 1

1. FCFS (First Come First Served)

First Come First Served

Process	Turnaround time	Latency
A	7	0
B	7	4
C	8	6
D	11	6
E	11	9
Average:	**8.8**	**5**

2. SPN (Shortest Process Next - i.e., without preemption)

Shortest Process Next

Process	Turnaround time	Latency
A	7	0
B	11	8
C	5	3
D	13	8
E	3	1
Average:	**7.8**	**4**

3. SRT (Shortest Remaining Time Next - i.e., with preemption)

Shortest Remaining Time Next
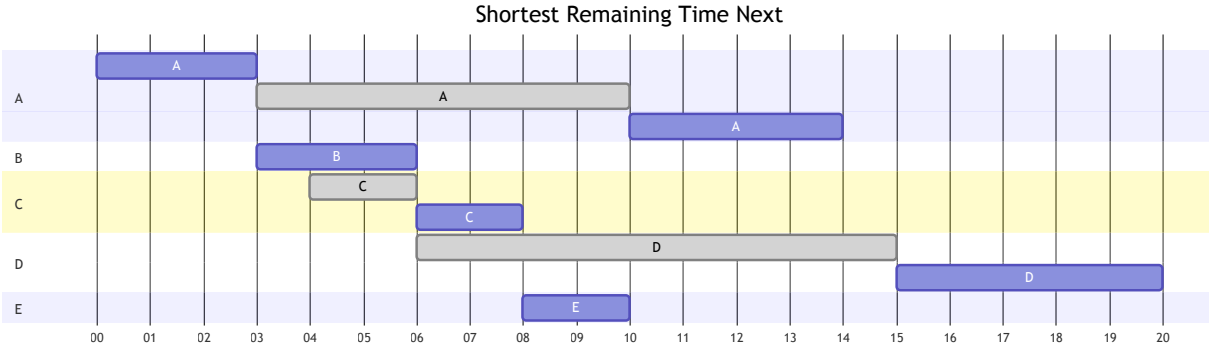
Process	Turnaround time	Latency
A	14	0
B	3	0
C	4	2
D	13	8
E	2	0
Average:	**7.2**	**2**

Task 2

4. Round Robin (quantum = 1)

Round Robin (quantum = 1)
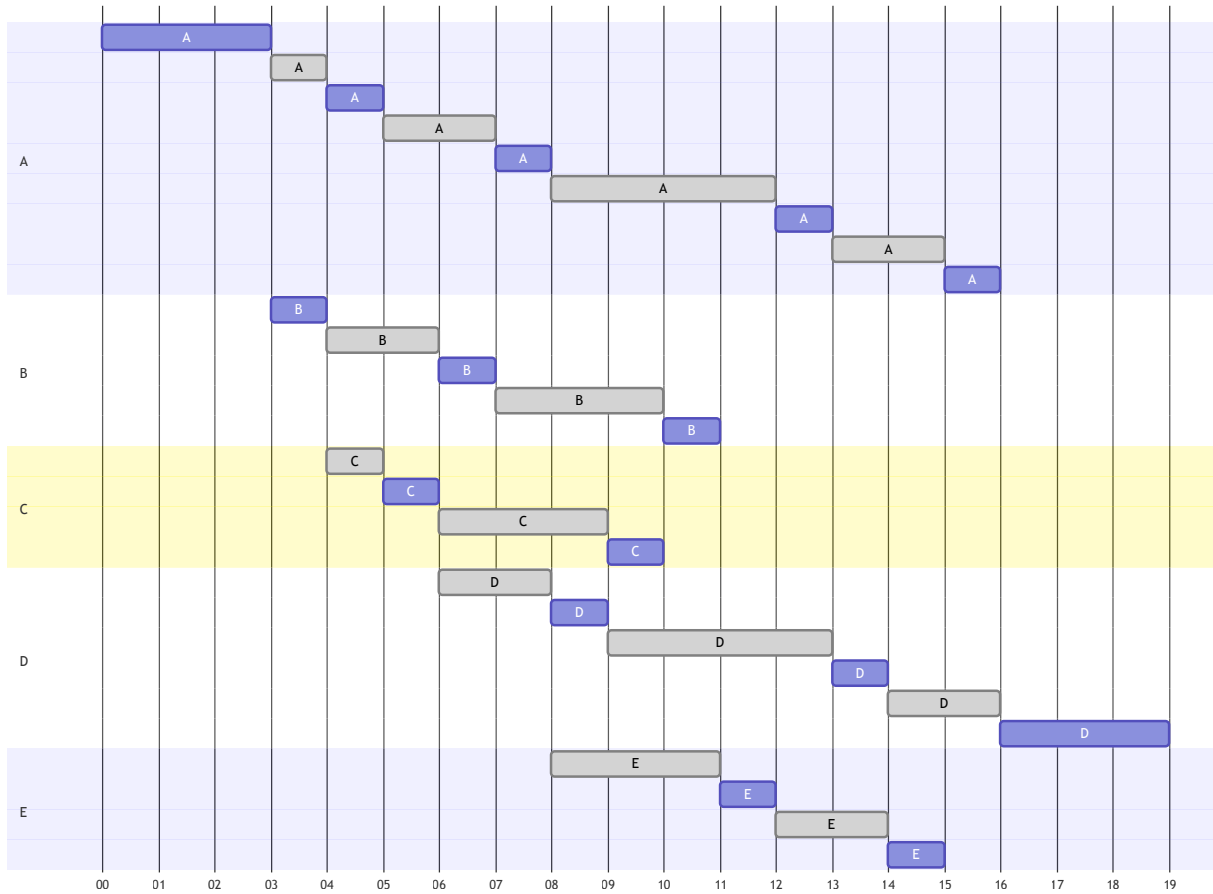
Process	Turnaround time	Latency
A	16	0
B	8	0
C	6	1
D	13	2
E	7	3
Average:	**10**	**1.2**

5. Round Robin (quantum = 4)

Round Robin (quantum = 4)
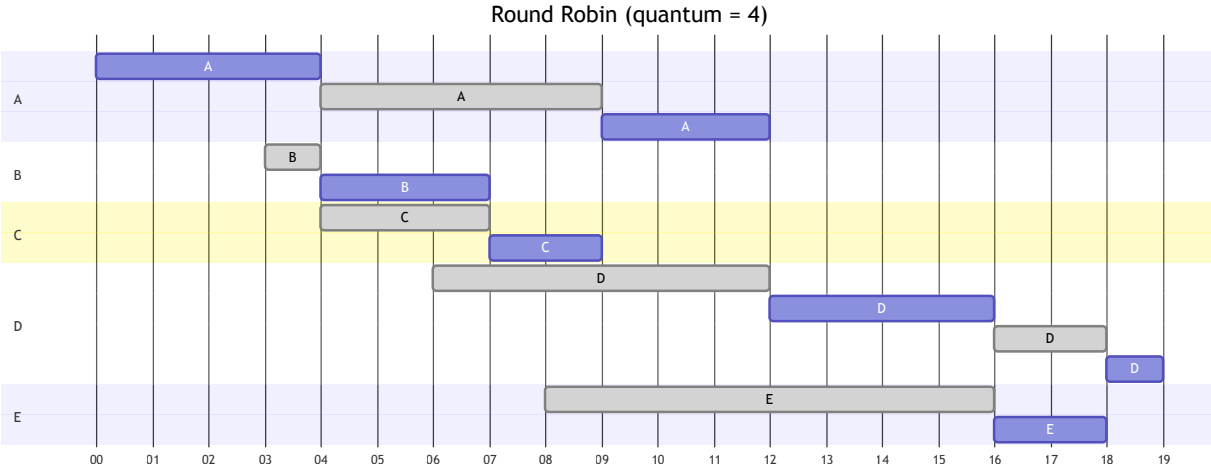
Process	Turnaround time	Latency
A	12	0
B	4	1
C	5	3
D	13	6
E	10	8
Average:	**8.8**	**3.6**

Task 3

6. Highest Priority First with preemption

Highest Priority First with preemption
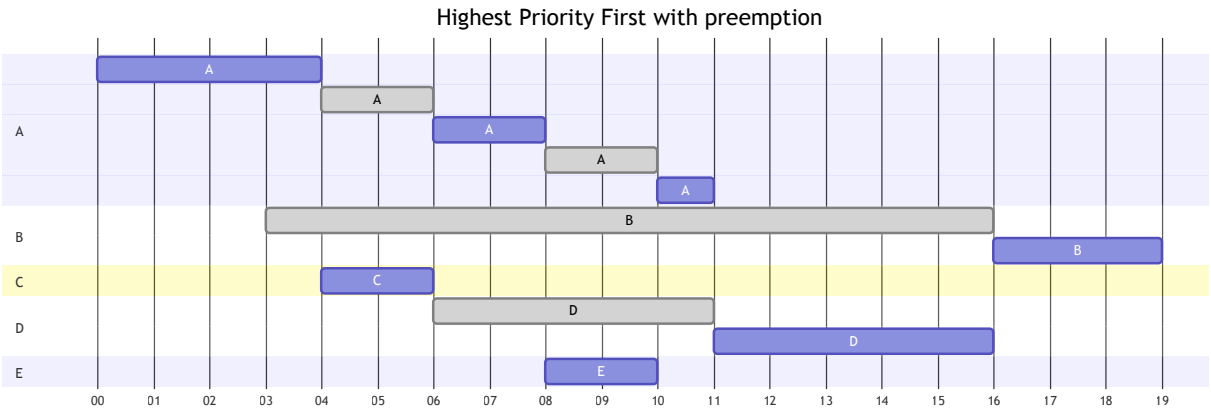
Process	Turnaround time	Latency
A	11	0
B	16	13
C	2	0

Process	Turnaround time	Latency
D	10	5
E	2	0
Average:	**8.2**	**3.6**

7. Highest Priority First without preemption

Highest Priority First without preemption
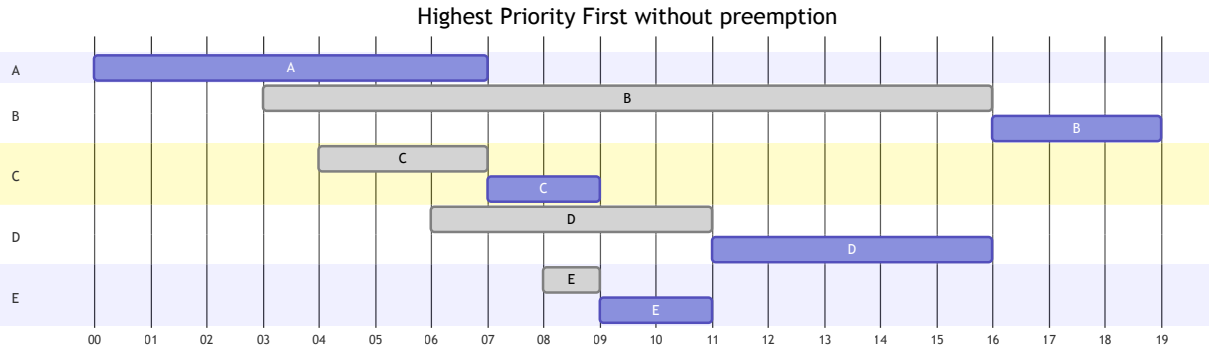
Process	Turnaround time	Latency
A	7	0
B	16	13
C	5	3
D	10	5
E	3	1
Average:	**8.2**	**4.4**