

- Given the arrival times and burst times for the processes below, draw a Gantt Chart (showing start and end times of each process) using multilevel feedback queue scheduling algorithm.

Show the states of the ready queues of different levels throughout the process.

There are 3 queues with decreasing priority all using round robin scheduling algorithm internally. **Q1 (quantum: 3, priority:0), Q2 (quantum:5, priority: 1), Q3 (quantum:10, priority:2)**

Process	Arrival Time	Burst Time
P1	0	10
P2	2	23
P3	5	18
P4	7	16

Gantt Chart:

P1	P2	P3	P4	P1	P2	P3	P4	P1	P2	P3	P4	P2
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0 3 6 9 12 17 22 27 32 34 44 54 62 67

Ready Queues:

	Q1 (RR, q = 3)		Q2 (RR, q = 5)		Q3 (RR, q = 10)	
	Before	After	Before	After	Before	After
0:	P1(10)	-	-	-	-	-
2:	P2(23)	P2(23)	-	-	-	-
3:	P2(23)	-	P1(7)	-	-	-
5:	P3(18)	P3(18)	P1(7)	-	-	-
6:	P3(18)	-	P1(7) P2(20)	-	-	-
7:	P4(16)	P4(16)	P1(7) P2(20)	-	-	-
9:	P4(16)	-	P1(7) P2(20) P3(15)	-	-	-

12:	-	-	P1(7) P2(20) P3(15) P4(13)	P2(20) P3(15) P4(13)	-	-
17:	-	-	P2(20) P3(15) P4(13)	P3(15) P4(13)	P1(2)	P1(2)
22:	-	-	P3(15) P4(13)	P4(13)	P1(2) P2(15)	P1(2) P2(15)
27:	-	-	P4(13)	-	P1(2) P2(15) P3(10)	P1(2) P2(15) P3(10)
32:	-	-	-	-	P1(2) P2(15) P3(10) P4(8)	P2(15) P3(10) P4(8)
34	-	-	-	-	P2(15) P3(10) P4(8)	P3(10) P4(8)
44	-	-	-	-	P3(10) P4(8) P2(5)	P4(8) P2(5)
54	-	-	-	-	P4(8) P2(5)	P2(5)
62	-	-	-	-	P2(5)	-
67	-	-	-	-	-	-

2. Given the arrival times and burst times for the processes below, draw a Gantt Chart (showing start and end times of each process) using multilevel feedback queue scheduling algorithm.

Show the states of the ready queues of different levels throughout the process.

There are 3 queues with decreasing priority, the first two using a round robin scheduling algorithm and the third using First-Come-First-Serve internally. **Q1 (quantum: 3, priority:0), Q2 (quantum:5, priority: 1), Q3 (FCFS, priority:2)**

Process	Arrival Time	Burst Time
P1	0	10
P2	2	23
P3	5	18
P4	7	16

Gantt Chart:

P1	P2	P3	P4	P1	P2	P3	P4	P1	P2	P3	P4	
0	3	6	9	12	17	22	27	32	34	49	59	67

Ready Queues:

	Q1 (RR, q = 3)		Q2 (RR, q = 5)		Q3 (FCFS)	
	Before	After	Before	After	Before	After
0:	P1(10)	-	-	-	-	-
2:	P2(23)	P2(23)	-	-	-	-
3:	P2(23)	-	P1(7)	-	-	-
5:	P3(18)	P3(18)	P1(7)	-	-	-
6:	P3(18)	-	P1(7) P2(20)	-	-	-
7:	P4(16)	P4(16)	P1(7) P2(20)	-	-	-
9:	P4(16)	-	P1(7) P2(20) P3(15)	-	-	-

12:	-	-	P1(7) P2(20) P3(15) P4(13)	P2(20) P3(15) P4(13)	-	-
17:	-	-	P2(20) P3(15) P4(13)	P3(15) P4(13)	P1(2)	P1(2)
22:	-	-	P3(15) P4(13)	P4(13)	P1(2) P2(15)	P1(2) P2(15)
27:	-	-	P4(13)	-	P1(2) P2(15) P3(10)	P1(2) P2(15) P3(10)
32:	-	-	-	-	P1(2) P2(15) P3(10) P4(8)	P2(15) P3(10) P4(8)
34	-	-	-	-	P2(15) P3(10) P4(8)	P3(10) P4(8)
49	-	-	-	-	P3(10) P4(8)	P4(8)
59	-	-	-	-	P4(8)	-
67	-	-	-	-	-	-