

MLFQ

Due Sep 24, 2019 at 11:59pm **Points** 18 **Questions** 18
Available after Sep 17, 2019 at 10:59am **Time Limit** None
Allowed Attempts Unlimited

This quiz is no longer available as the course has been concluded.

Attempt History

	Attempt	Time	Score
KEPT	Attempt 3	1 minute	18 out of 18
LATEST	Attempt 3	1 minute	18 out of 18
	Attempt 2	2 minutes	17 out of 18
	Attempt 1	17 minutes	4 out of 18

Score for this attempt: **18** out of 18

Submitted Sep 23, 2019 at 11:11pm

This attempt took 1 minute.

Question 1

1 / 1 pts

Assume you have a MLFQ scheduler with 3 priority levels:

OPTIONS quantum length for queue 2 is 2

OPTIONS quantum length for queue 1 is 4

OPTIONS quantum length for queue 0 is 8

And a workload with 3 cpu-only jobs:

Job 0: startTime 0 - runTime 16 - ioFreq 0

Job 1: startTime 0 - runTime 16 - ioFreq 0

Job 2: startTime 0 - runTime 16 - ioFreq 0

Time starts in interval 0.

What will be the response time of Job 2?

Correct!

4

Correct Answers

4 (with margin: 0)

Question 2**1 / 1 pts**

When will Job 2 first be scheduled at priority level 1?

Correct!

14

Correct Answers

14 (with margin: 0)

Question 3**1 / 1 pts**

When will job 2 be first scheduled at priority 0?

Correct!

34

Correct Answers

34 (with margin: 0)

Question 4**1 / 1 pts**

What is the turnaround time of Job 0?

Correct!

44

Correct Answers

44 (with margin: 0)

Question 5**1 / 1 pts**

What is the turnaround time of Job 1?

Correct!

46

Correct Answers

46 (with margin: 0)

Question 6**1 / 1 pts**

What is the turnaround time of Job 2?

Correct!

48

Correct Answers

48 (with margin: 0)

Execution Trace:

[time 0] JOB BEGINS by JOB 0

[time 0] JOB BEGINS by JOB 1

[time 0] JOB BEGINS by JOB 2

[time 0] Run JOB 0 at PRIORITY 2 [TICKSLEFT 1 RUNTIME 16
TIMELEFT 15][time 1] Run JOB 0 at PRIORITY 2 [TICKSLEFT 0 RUNTIME 16
TIMELEFT 14][time 2] Run JOB 1 at PRIORITY 2 [TICKSLEFT 1 RUNTIME 16
TIMELEFT 15][time 3] Run JOB 1 at PRIORITY 2 [TICKSLEFT 0 RUNTIME 16
TIMELEFT 14][time 4] Run JOB 2 at PRIORITY 2 [TICKSLEFT 1 RUNTIME 16
TIMELEFT 15]

[time 5] Run JOB 2 at PRIORITY 2 [TICKSLEFT 0 RUNTIME 16

[time 5] Run JOB 2 at PRIORITY 2 [TICKSLEFT 10 RUNTIME 10 TIMELEFT 14]

[time 6] Run JOB 0 at PRIORITY 1 [TICKSLEFT 3 RUNTIME 16 TIMELEFT 13]

[time 7] Run JOB 0 at PRIORITY 1 [TICKSLEFT 2 RUNTIME 16 TIMELEFT 12]

[time 8] Run JOB 0 at PRIORITY 1 [TICKSLEFT 1 RUNTIME 16 TIMELEFT 11]

[time 9] Run JOB 0 at PRIORITY 1 [TICKSLEFT 0 RUNTIME 16 TIMELEFT 10]

[time 10] Run JOB 1 at PRIORITY 1 [TICKSLEFT 3 RUNTIME 16 TIMELEFT 13]

[time 11] Run JOB 1 at PRIORITY 1 [TICKSLEFT 2 RUNTIME 16 TIMELEFT 12]

[time 12] Run JOB 1 at PRIORITY 1 [TICKSLEFT 1 RUNTIME 16 TIMELEFT 11]

[time 13] Run JOB 1 at PRIORITY 1 [TICKSLEFT 0 RUNTIME 16 TIMELEFT 10]

[time 14] Run JOB 2 at PRIORITY 1 [TICKSLEFT 3 RUNTIME 16 TIMELEFT 13]

[time 15] Run JOB 2 at PRIORITY 1 [TICKSLEFT 2 RUNTIME 16 TIMELEFT 12]

[time 16] Run JOB 2 at PRIORITY 1 [TICKSLEFT 1 RUNTIME 16 TIMELEFT 11]

[time 17] Run JOB 2 at PRIORITY 1 [TICKSLEFT 0 RUNTIME 16 TIMELEFT 10]

[time 18] Run JOB 0 at PRIORITY 0 [TICKSLEFT 7 RUNTIME 16 TIMELEFT 9]

[time 19] Run JOB 0 at PRIORITY 0 [TICKSLEFT 6 RUNTIME 16 TIMELEFT 8]

[time 20] Run JOB 0 at PRIORITY 0 [TICKSLEFT 5 RUNTIME 16 TIMELEFT 7]

[time 21] Run JOB 0 at PRIORITY 0 [TICKSLEFT 4 RUNTIME 16 TIMELEFT 6]

[time 22] Run JOB 0 at PRIORITY 0 [TICKSLEFT 3 RUNTIME 16 TIMELEFT 5]

[time 23] Run JOB 0 at PRIORITY 0 [TICKSLEFT 2 RUNTIME 16 TIMELEFT 4]

[time 24] Run JOB 0 at PRIORITY 0 [TICKSLEFT 1 RUNTIME 16 TIMELEFT 3]

[time 25] Run JOB 0 at PRIORITY 0 [TICKSLEFT 0 RUNTIME

16 TIMELEFT 2]
[time 26] Run JOB 1 at PRIORITY 0 [TICKSLEFT 7 RUNTIME
16 TIMELEFT 9]
[time 27] Run JOB 1 at PRIORITY 0 [TICKSLEFT 6 RUNTIME
16 TIMELEFT 8]
[time 28] Run JOB 1 at PRIORITY 0 [TICKSLEFT 5 RUNTIME
16 TIMELEFT 7]
[time 29] Run JOB 1 at PRIORITY 0 [TICKSLEFT 4 RUNTIME
16 TIMELEFT 6]
[time 30] Run JOB 1 at PRIORITY 0 [TICKSLEFT 3 RUNTIME
16 TIMELEFT 5]
[time 31] Run JOB 1 at PRIORITY 0 [TICKSLEFT 2 RUNTIME
16 TIMELEFT 4]
[time 32] Run JOB 1 at PRIORITY 0 [TICKSLEFT 1 RUNTIME
16 TIMELEFT 3]
[time 33] Run JOB 1 at PRIORITY 0 [TICKSLEFT 0 RUNTIME
16 TIMELEFT 2]
[time 34] Run JOB 2 at PRIORITY 0 [TICKSLEFT 7 RUNTIME
16 TIMELEFT 9]
[time 35] Run JOB 2 at PRIORITY 0 [TICKSLEFT 6 RUNTIME
16 TIMELEFT 8]
[time 36] Run JOB 2 at PRIORITY 0 [TICKSLEFT 5 RUNTIME
16 TIMELEFT 7]
[time 37] Run JOB 2 at PRIORITY 0 [TICKSLEFT 4 RUNTIME
16 TIMELEFT 6]
[time 38] Run JOB 2 at PRIORITY 0 [TICKSLEFT 3 RUNTIME
16 TIMELEFT 5]
[time 39] Run JOB 2 at PRIORITY 0 [TICKSLEFT 2 RUNTIME
16 TIMELEFT 4]
[time 40] Run JOB 2 at PRIORITY 0 [TICKSLEFT 1 RUNTIME
16 TIMELEFT 3]
[time 41] Run JOB 2 at PRIORITY 0 [TICKSLEFT 0 RUNTIME
16 TIMELEFT 2]
[time 42] Run JOB 0 at PRIORITY 0 [TICKSLEFT 7 RUNTIME
16 TIMELEFT 1]
[time 43] Run JOB 0 at PRIORITY 0 [TICKSLEFT 6 RUNTIME
16 TIMELEFT 0]
[time 44] FINISHED JOB 0
[time 44] Run JOB 1 at PRIORITY 0 [TICKSLEFT 7 RUNTIME
16 TIMELEFT 1]
[time 45] Run JOB 1 at PRIORITY 0 [TICKSLEFT 6 RUNTIME

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16 TIMELEFT 0 ]  
[ time 46 ] FINISHED JOB 1  
[ time 46 ] Run JOB 2 at PRIORITY 0 [ TICKSLEFT 7 RUNTIME  
16 TIMELEFT 1 ]  
[ time 47 ] Run JOB 2 at PRIORITY 0 [ TICKSLEFT 6 RUNTIME  
16 TIMELEFT 0 ]  
[ time 48 ] FINISHED JOB 2
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Question 7**1 / 1 pts**

For the same MLFQ scheduler, assume you have just two jobs and one arrives at time 5.

Job 0: startTime 0 - runTime 16 - ioFreq 0

Job 1: startTime 5 - runTime 16 - ioFreq 0

At what time will Job 1 be scheduled?

Correct!**Correct Answers**

5 (with margin: 0)

Question 8**1 / 1 pts**

What is the response time for Job 1?

Correct!**Correct Answers**

0 (with margin: 0)

Question 9**1 / 1 pts**

What is the last time at which Job 0 will be scheduled at Priority 1?

Correct!**Correct Answers**

7 (with margin: 0)

Question 10**1 / 1 pts**

What is the first time Job 0 will be scheduled at Priority 0?

Correct!**Correct Answers**

12 (with margin: 0)

Question 11**1 / 1 pts**

What is the first time Job 1 will be scheduled at Priority 0?

Correct!**Correct Answers**

20 (with margin: 0)

Question 12**1 / 1 pts**

What will be the turnaround time for Job 0?

Correct!

30

Correct Answers

30 (with margin: 0)

Question 13**1 / 1 pts**

What will be the turnaround time for Job 1?

Correct!

27

Correct Answers

27 (with margin: 0)

Execution Trace:

[time 0] JOB BEGINS by JOB 0

[time 0] Run JOB 0 at PRIORITY 2 [TICKSLEFT 1 RUNTIME 16
TIMELEFT 15][time 1] Run JOB 0 at PRIORITY 2 [TICKSLEFT 0 RUNTIME 16
TIMELEFT 14][time 2] Run JOB 0 at PRIORITY 1 [TICKSLEFT 3 RUNTIME 16
TIMELEFT 13][time 3] Run JOB 0 at PRIORITY 1 [TICKSLEFT 2 RUNTIME 16
TIMELEFT 12][time 4] Run JOB 0 at PRIORITY 1 [TICKSLEFT 1 RUNTIME 16
TIMELEFT 11]

[time 5] JOB BEGINS by JOB 1

[time 5] Run JOB 1 at PRIORITY 2 [TICKSLEFT 1 RUNTIME 16
TIMELEFT 15][time 6] Run JOB 1 at PRIORITY 2 [TICKSLEFT 0 RUNTIME 16
TIMELEFT 14][time 7] Run JOB 0 at PRIORITY 1 [TICKSLEFT 0 RUNTIME 16
TIMELEFT 10][time 8] Run JOB 1 at PRIORITY 1 [TICKSLEFT 3 RUNTIME 16
TIMELEFT 13]

[time 9] Run JOB 1 at PRIORITY 1 [TICKSLEFT 2 RUNTIME 16

TIMELEFT 12]

[time 10] Run JOB 1 at PRIORITY 1 [TICKSLEFT 1 RUNTIME
16 TIMELEFT 11]

[time 11] Run JOB 1 at PRIORITY 1 [TICKSLEFT 0 RUNTIME
16 TIMELEFT 10]

[time 12] Run JOB 0 at PRIORITY 0 [TICKSLEFT 7 RUNTIME
16 TIMELEFT 9]

[time 13] Run JOB 0 at PRIORITY 0 [TICKSLEFT 6 RUNTIME
16 TIMELEFT 8]

[time 14] Run JOB 0 at PRIORITY 0 [TICKSLEFT 5 RUNTIME
16 TIMELEFT 7]

[time 15] Run JOB 0 at PRIORITY 0 [TICKSLEFT 4 RUNTIME
16 TIMELEFT 6]

[time 16] Run JOB 0 at PRIORITY 0 [TICKSLEFT 3 RUNTIME
16 TIMELEFT 5]

[time 17] Run JOB 0 at PRIORITY 0 [TICKSLEFT 2 RUNTIME
16 TIMELEFT 4]

[time 18] Run JOB 0 at PRIORITY 0 [TICKSLEFT 1 RUNTIME
16 TIMELEFT 3]

[time 19] Run JOB 0 at PRIORITY 0 [TICKSLEFT 0 RUNTIME
16 TIMELEFT 2]

[time 20] Run JOB 1 at PRIORITY 0 [TICKSLEFT 7 RUNTIME
16 TIMELEFT 9]

[time 21] Run JOB 1 at PRIORITY 0 [TICKSLEFT 6 RUNTIME
16 TIMELEFT 8]

[time 22] Run JOB 1 at PRIORITY 0 [TICKSLEFT 5 RUNTIME
16 TIMELEFT 7]

[time 23] Run JOB 1 at PRIORITY 0 [TICKSLEFT 4 RUNTIME
16 TIMELEFT 6]

[time 24] Run JOB 1 at PRIORITY 0 [TICKSLEFT 3 RUNTIME
16 TIMELEFT 5]

[time 25] Run JOB 1 at PRIORITY 0 [TICKSLEFT 2 RUNTIME
16 TIMELEFT 4]

[time 26] Run JOB 1 at PRIORITY 0 [TICKSLEFT 1 RUNTIME
16 TIMELEFT 3]

[time 27] Run JOB 1 at PRIORITY 0 [TICKSLEFT 0 RUNTIME
16 TIMELEFT 2]

[time 28] Run JOB 0 at PRIORITY 0 [TICKSLEFT 7 RUNTIME
16 TIMELEFT 1]

[time 29] Run JOB 0 at PRIORITY 0 [TICKSLEFT 6 RUNTIME
16 TIMELEFT 0]

[time 30] FINISHED JOB 0

[time 30] Run JOB 1 at PRIORITY 0 [TICKSLEFT 7 RUNTIME

16 TIMELEFT 1]

[time 31] Run JOB 1 at PRIORITY 0 [TICKSLEFT 6 RUNTIME

16 TIMELEFT 0]

[time 32] FINISHED JOB 1

Question 14

1 / 1 pts

Assume the same MLFQ scheduler; assume two jobs that both arrive at the same time, but now perform I/O at the stated frequency:

Job 0: startTime 0 - runTime 16 - ioFreq 5 (performs IO after running for 5 time units)

Job 1: startTime 0 - runTime 16 - ioFreq 12 (performs IO after running for 12 time units)

Assume IO takes 5 time units to complete. Assume when a job completes IO that it is placed at the end of its priority queue and the time remaining in its time slice (or quantum) is not reset.

At what time will Job 0 start its first IO?

Correct!

Correct Answers

7 (with margin: 0)

Question 15

1 / 1 pts

Which job number will be scheduled at time 12?

Correct!

Correct Answers 0 (with margin: 0)

Question 16**1 / 1 pts**

When will Job 1 begin its first IO?

Correct!

Correct Answers 18 (with margin: 0)

Question 17**1 / 1 pts**

What is the turnaround time of Job 0?

Correct!

Correct Answers 38 (with margin: 0)

Question 18**1 / 1 pts**

What is the turnaround time of Job 1?

Correct!

Correct Answers 27 (with margin: 0)

[time 0] JOB BEGINS by JOB 0
[time 0] JOB BEGINS by JOB 1
[time 0] Run JOB 0 at PRIORITY 2 [TICKSLEFT 1 RUNTIME 16
TIMELEFT 15]
[time 1] Run JOB 0 at PRIORITY 2 [TICKSLEFT 0 RUNTIME 16
TIMELEFT 14]
[time 2] Run JOB 1 at PRIORITY 2 [TICKSLEFT 1 RUNTIME 16
TIMELEFT 15]
[time 3] Run JOB 1 at PRIORITY 2 [TICKSLEFT 0 RUNTIME 16
TIMELEFT 14]
[time 4] Run JOB 0 at PRIORITY 1 [TICKSLEFT 3 RUNTIME 16
TIMELEFT 13]
[time 5] Run JOB 0 at PRIORITY 1 [TICKSLEFT 2 RUNTIME 16
TIMELEFT 12]
[time 6] Run JOB 0 at PRIORITY 1 [TICKSLEFT 1 RUNTIME 16
TIMELEFT 11]
[time 7] IO_START by JOB 0
[time 7] Run JOB 1 at PRIORITY 1 [TICKSLEFT 3 RUNTIME 16
TIMELEFT 13]
[time 8] Run JOB 1 at PRIORITY 1 [TICKSLEFT 2 RUNTIME 16
TIMELEFT 12]
[time 9] Run JOB 1 at PRIORITY 1 [TICKSLEFT 1 RUNTIME 16
TIMELEFT 11]
[time 10] Run JOB 1 at PRIORITY 1 [TICKSLEFT 0 RUNTIME
16 TIMELEFT 10]
[time 11] Run JOB 1 at PRIORITY 0 [TICKSLEFT 7 RUNTIME
16 TIMELEFT 9]
[time 12] IO_DONE by JOB 0
[time 12] Run JOB 0 at PRIORITY 1 [TICKSLEFT 0 RUNTIME
16 TIMELEFT 10]
[time 13] Run JOB 1 at PRIORITY 0 [TICKSLEFT 6 RUNTIME
16 TIMELEFT 8]
[time 14] Run JOB 1 at PRIORITY 0 [TICKSLEFT 5 RUNTIME
16 TIMELEFT 7]
[time 15] Run JOB 1 at PRIORITY 0 [TICKSLEFT 4 RUNTIME
16 TIMELEFT 6]
[time 16] Run JOB 1 at PRIORITY 0 [TICKSLEFT 3 RUNTIME
16 TIMELEFT 5]
[time 17] Run JOB 1 at PRIORITY 0 [TICKSLEFT 2 RUNTIME
16 TIMELEFT 4]
[time 18] IO_START by JOB 1

[time 18] Run JOB 0 at PRIORITY 0 [TICKSLEFT 7 RUNTIME
16 TIMELEFT 9]
[time 19] Run JOB 0 at PRIORITY 0 [TICKSLEFT 6 RUNTIME
16 TIMELEFT 8]
[time 20] Run JOB 0 at PRIORITY 0 [TICKSLEFT 5 RUNTIME
16 TIMELEFT 7]
[time 21] Run JOB 0 at PRIORITY 0 [TICKSLEFT 4 RUNTIME
16 TIMELEFT 6]
[time 22] IO_START by JOB 0
[time 22] IDLE
[time 23] IO_DONE by JOB 1
[time 23] Run JOB 1 at PRIORITY 0 [TICKSLEFT 1 RUNTIME
16 TIMELEFT 3]
[time 24] Run JOB 1 at PRIORITY 0 [TICKSLEFT 0 RUNTIME
16 TIMELEFT 2]
[time 25] Run JOB 1 at PRIORITY 0 [TICKSLEFT 7 RUNTIME
16 TIMELEFT 1]
[time 26] Run JOB 1 at PRIORITY 0 [TICKSLEFT 6 RUNTIME
16 TIMELEFT 0]
[time 27] FINISHED JOB 1
[time 27] IO_DONE by JOB 0
[time 27] Run JOB 0 at PRIORITY 0 [TICKSLEFT 3 RUNTIME
16 TIMELEFT 5]
[time 28] Run JOB 0 at PRIORITY 0 [TICKSLEFT 2 RUNTIME
16 TIMELEFT 4]
[time 29] Run JOB 0 at PRIORITY 0 [TICKSLEFT 1 RUNTIME
16 TIMELEFT 3]
[time 30] Run JOB 0 at PRIORITY 0 [TICKSLEFT 0 RUNTIME
16 TIMELEFT 2]
[time 31] Run JOB 0 at PRIORITY 0 [TICKSLEFT 7 RUNTIME
16 TIMELEFT 1]
[time 32] IO_START by JOB 0
[time 32] IDLE
[time 33] IDLE
[time 34] IDLE
[time 35] IDLE
[time 36] IDLE
[time 37] IO_DONE by JOB 0
[time 37] Run JOB 0 at PRIORITY 0 [TICKSLEFT 6 RUNTIME
16 TIMELEFT 0]
[time 38] FINISHED JOB 0

Final statistics:

Job 0: startTime 0 - response 0 - turnaround 38

Job 1: startTime 0 - response 2 - turnaround 27

Avg 1: startTime n/a - response 1.00 - turnaround 32.50

Quiz Score: **18** out of 18