

Operating System: Multilevel Queue Scheduling

By: Vishvadeep Gothi



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**AIR- 19, 119, 440, 682
in GATE**



**ME from IISc Bangalore
Mtech BITS Pilani in Data
Science**



**14+ Years of Teaching Experience,
10+ Years in GATE/IES**



Subjects Taken:
Computer Organization & Architecture,
data structure, operating system,
C-Programming, Data science,
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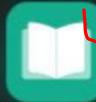
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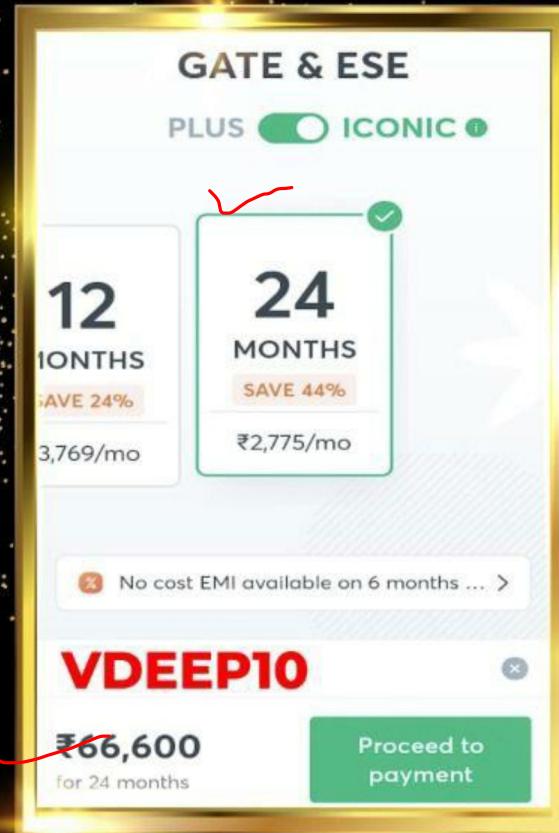
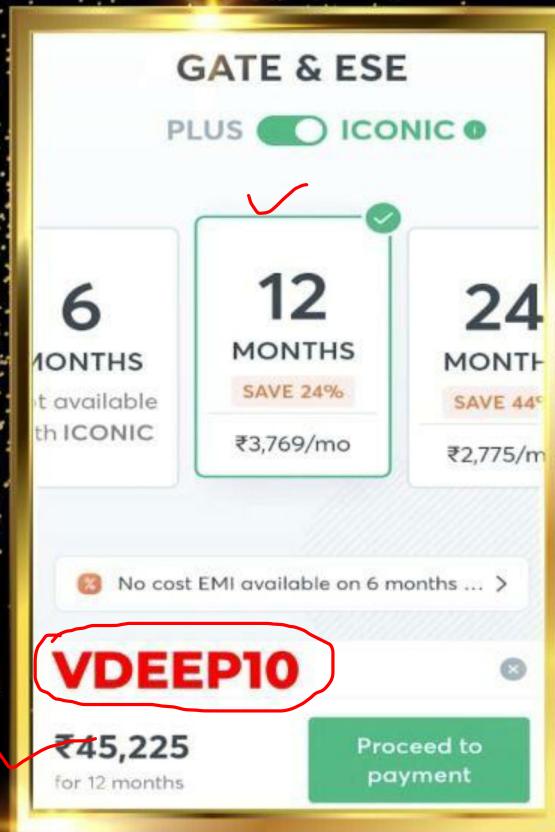
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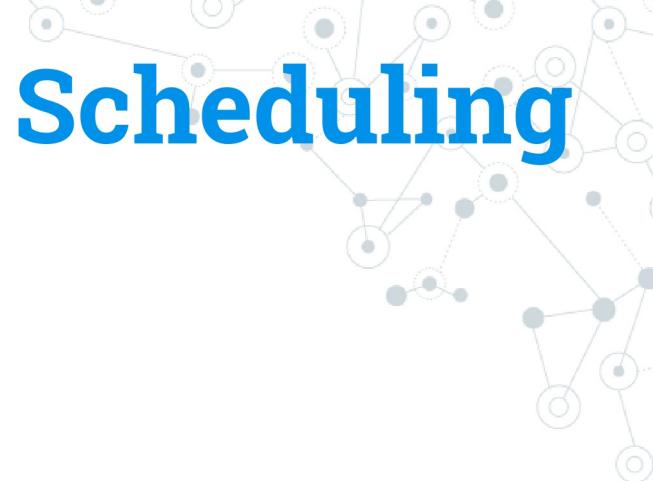
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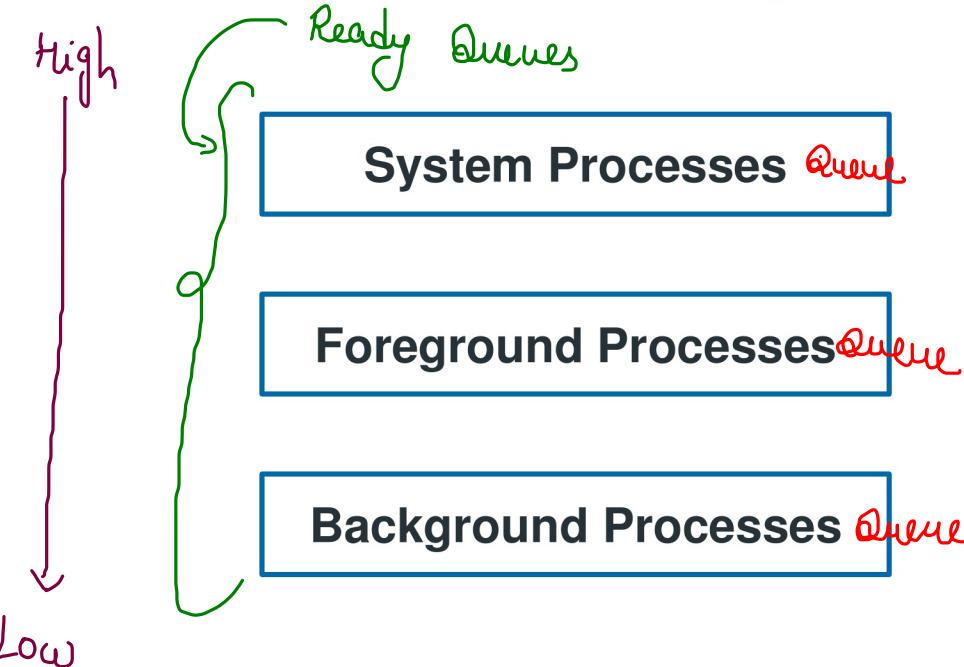
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Multilevel Queue (MLQ) Scheduling



Multilevel Queue (MLQ) Scheduling



Scheduling Among Queues

1. Fixed priority preemptive scheduling method
2. Time slicing

suffers from starvation

$Q_1 \Rightarrow 60\% \text{ time}$

$Q_2 \Rightarrow 30\% \text{ time}$

$Q_3 \Rightarrow 10\% \text{ time}$

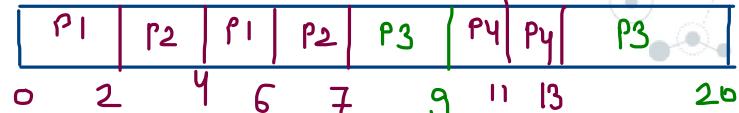
Question

High priority

Queue 1: RR with Q=2

Queue 2: FCFS

Ready Queue 1 = ~~P1, P2~~ at 9
P4
P3



Process	Arrival Time	Burst Time	Queue
P1	0	4	1
P2	0	3	1
P3	0	9	2
P4	9	4	1

Multilevel Queue (MLQ) Scheduling

Disadvantages:

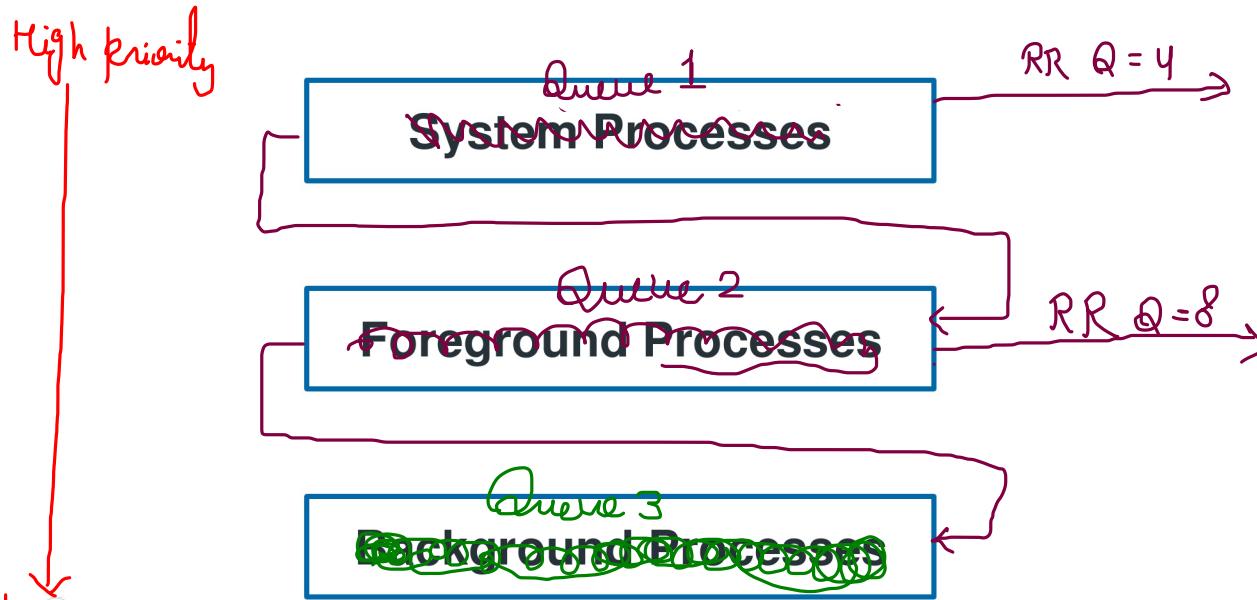
1. Some processes may starve for CPU if some higher priority queues are never becoming empty.
2. It is inflexible in nature.



Multilevel Feedback Queue (MLFQ) Scheduling



Multilevel Feedback Queue (MLFQ) Scheduling



Multilevel Feedback Queue (MLFQ) Scheduling

Disadvantage:

1. Some processes may **starve** for CPU if some higher priority queues are never becoming empty.

→ **solution** → moving a process to higher level queue after certain duration.

Advantage:

1. Flexible

Adv. & Disadv. of Scheduling Algos



FCFS

Advantages:

1. Easy to implement ✓
2. No complex logic ✓
3. No starvation ✓

Disadvantages:

1. No option of Preemption ✓
2. Convoy effect makes the system slow ✓

SJF

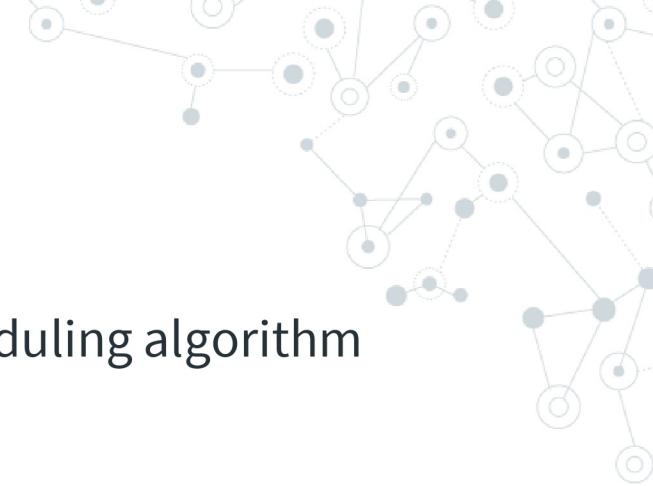
Advantages:

1. Minimum average waiting time among non-preemptive scheduling
2. Better throughput in continue run

Disadvantages:

1. No practical implementation because Burst time is not known in advance
2. No option of Preemption
3. Longer Processes may suffer from ~~deadlock~~
Starvation

SRTF



Advantages:

1. ✓ Minimum average waiting time among all scheduling algorithm
2. ✓ Better throughput in continue run

Disadvantages:

1. ✓ No practical implementation because Burst time is not known in advance
2. Longer Processes may suffer from ~~deadlock~~
starvation



Priority Based Algorithm

Advantages:

1. Better response for real time situations

Disadvantages:

1. Low Priority Processes may suffer from ~~deadlock~~
starvation

Round Robin Algorithm

Advantages:

1. ✓ All processes execute one by one, so no starvation
2. ✓ Better interactiveness
3. ✓ Burst time is not required to be known in advance

Disadvantages:

1. ✓ Average waiting time and turnaround time is more
2. ✓ Can degrade to FCFS



Next Class

Threads ✓



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Complex problems
on CPU Scheduling

✓ Multithreading



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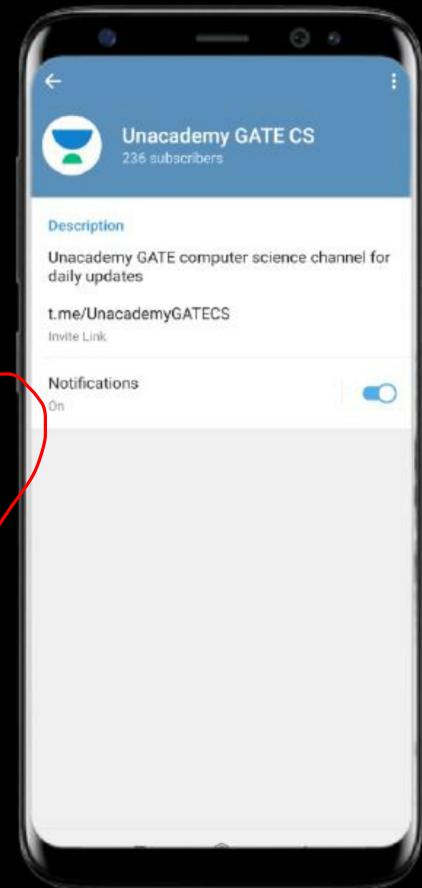
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