Department of Computer Science and Engineering

FACULTY OF ENGINEERING AND TECHNOLOGY
UNIVERSITY OF LUCKNOW
LUCKNOW

Dr. Zeeshan Ali Siddiqui
Assistant Professor
Deptt. of C.S.E.

MULTILEVEL QUEUE CONCEPT

Multilevel Queue 1/3

- Ready queue is partitioned into separate queues:
  - foreground (interactive)
  - background (batch)

- Each queue has its own scheduling algorithm
  - foreground – RR
  - background – FCFS

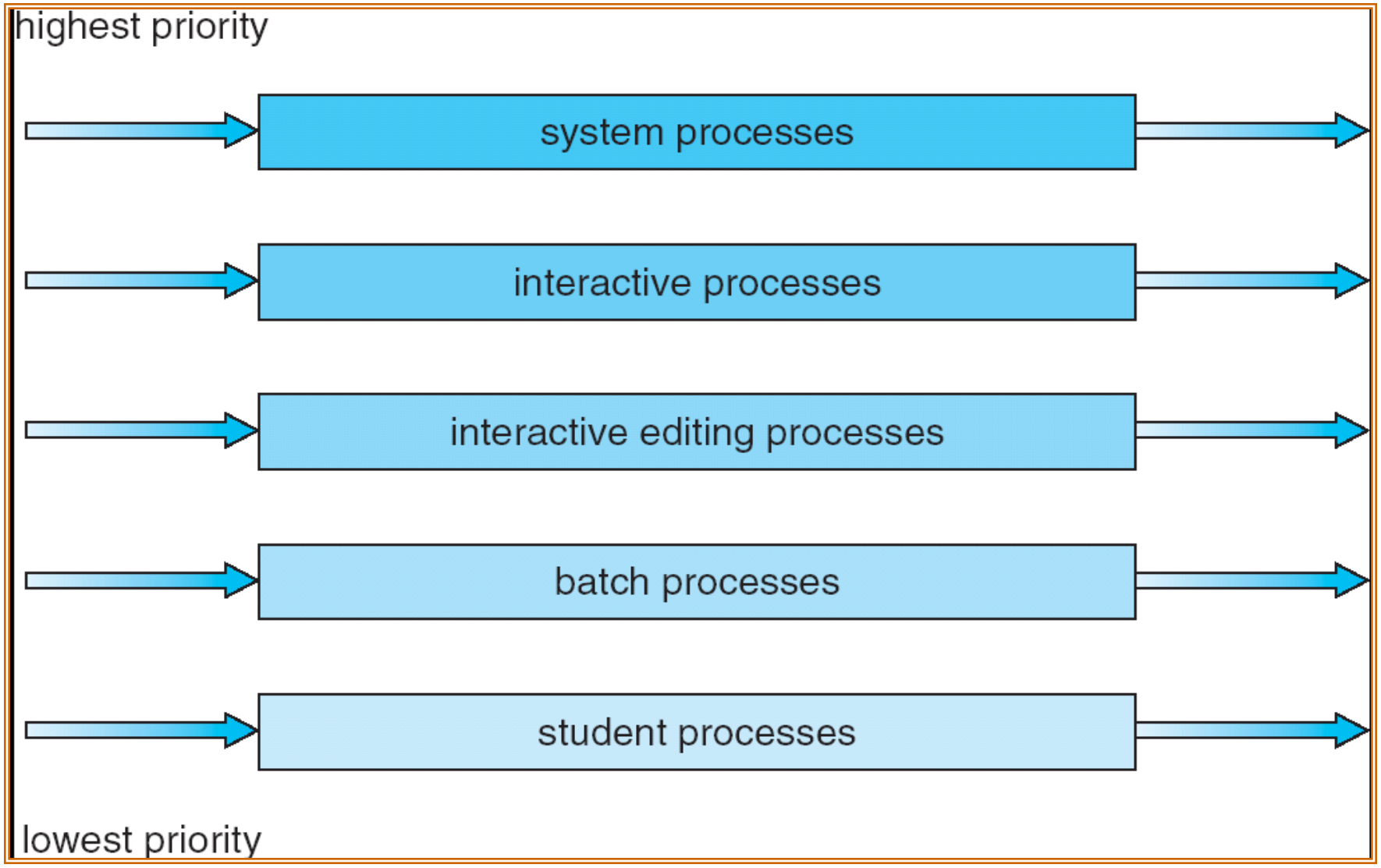
- Scheduling must be done between the queues

Multilevel Queue 2/3

- Fixed priority scheduling
  - Serve all from foreground, then from background
  - Possibility of starvation.

- Time slice
  - Each queue gets a certain amount of CPU time which it can schedule amongst its processes
    - ✓ 80% to foreground in RR
    - ✓ 20% to background in FCFS

Multilevel Queue 3/3



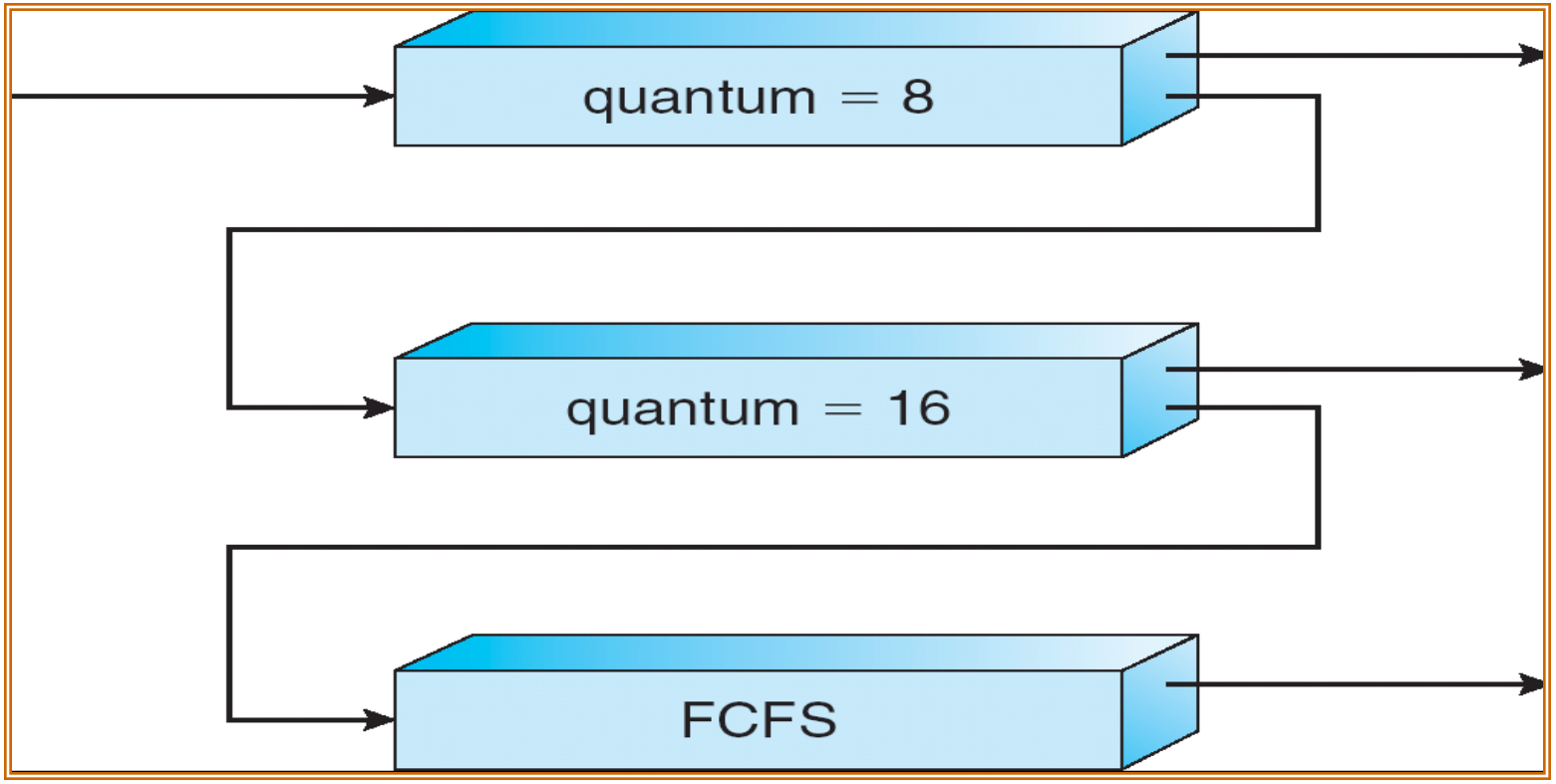
MULTILEVEL FEEDBACK QUEUE CONCEPT

Multilevel Feedback Queue

- A process can move between the various queues; aging can be implemented this way

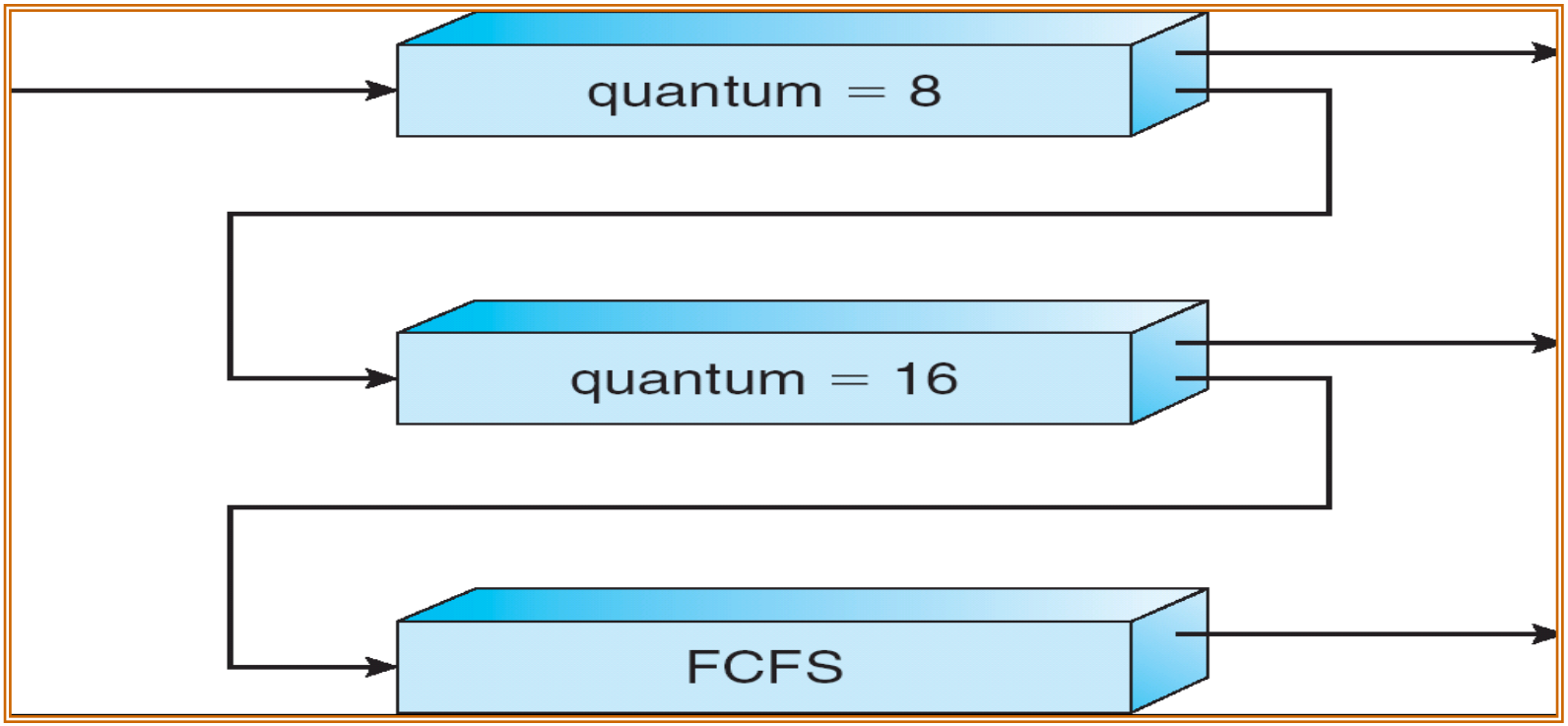
- *Multilevel-feedback-queue scheduler* defined by the following parameters:
  - number of queues
  - scheduling algorithms for each queue
  - method used to determine when to upgrade a process
  - method used to determine when to demote a process
  - method used to determine which queue a process will enter when that process needs service

Multilevel Feedback Queue: Example 1/2



- Three queues:
  - Q0 – RR with time quantum 8 milliseconds
  - Q1 – RR time quantum 16 milliseconds
  - Q2 – FCFS

Multilevel Feedback Queue: Example 2/2



- Scheduling
  - The scheduler first executes all processes in queue 0.
  - Processes in queue 1 will be executed only if queues 0 is empty.
  - Similarly, processes in queue 2 will be executed only if queues 0 and 1 are empty.
    - ✓ *A process that arrives for queue 1 will preempt a process in queue 2.*
    - ✓ *A process that arrives for queue 0 will preempt a process in queue 1.*

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.