Advanced Scheduling (Practice)

ICS332

Operating Systems

Henri Casanova (henric@hawaii.edu)

(q1) MLFQ Scheduling

- **Job A** (first in the ready queue initially):
  - CPU burst time 3ms (starts with a CPU burst), I/O burst time 1ms, doing I/O on the disk
- **Job B**:
  - CPU burst time 6ms (starts with a CPU burst), I/O burst time 2ms, doing I/O on the NIC (Network Interface Card)
- MLQ Scheduling:
  - Top-priority queue: RR with time quantum 5ms
  - Low-priority queue: RR with time quantum 10ms
- Show the CPU utilization time-line for 25 ms as ASCII art

(q1) Answer

- **Job A** (first in the ready queue initially):
  - CPU burst time 3ms (starts with a CPU burst), I/O burst time 1ms, doing I/O on the disk
- **Job B**:
  - CPU burst time 6ms (starts with a CPU burst), I/O burst time 2ms, doing I/O on the NIC (Network Interface Card)
- MLQ Scheduling:
  - Top-priority queue: RR with time quantum 5ms
  - Low-priority queue: RR with time quantum 10ms
- Show the CPU utilization time-line for 25 ms as ASCII art

```
CPU  :  AAABBBBBAAABAAABAAABAAAB
Disk:       A       A   A   A   A
NIC  :             BB
```

(q2) MLFQ Scheduling

- **Job A** (first in the ready queue initially):
  - CPU burst time 3ms (starts with a CPU burst), I/O burst time 1ms, doing I/O on the disk
- **Jobs B and C**:
  - CPU burst time ∞ ms (starts with a CPU burst), no I/O
- MLQ Scheduling:
  - Top-priority queue: RR with time quantum 6ms
  - Low-priority queue: RR with time quantum 10ms
- Show the CPU utilization time-line for 31 ms as ASCII art

(q2) Answer

- **Job A** (first in the ready queue initially):
  - CPU burst time 3ms (starts with a CPU burst), I/O burst time 1ms, doing I/O on the disk
- **Jobs B and C**:
  - CPU burst time ∞ ms (starts with a CPU burst), no I/O
- MLQ Scheduling:
  - Top-priority queue: RR with time quantum 6ms
  - Low-priority queue: RR with time quantum 10ms
- Show the CPU utilization time-line for 31 ms as ASCII art

```
CPU  :  AAABBBBBBCCCCCCAAABAAACAAABAAAC
Disk:     A                 A   A   A   A
```

(q3) MLFQ with Boost

- **Job A** (first in the ready queue initially):
  - CPU burst time 3ms (starts with a CPU burst), I/O burst time 1ms, doing I/O on the disk
- **Jobs B**:
  - CPU burst time ∞ ms (starts with a CPU burst), no I/O
- MLQ Scheduling:
  - Top-priority queue: RR with time quantum 5ms
  - Low-priority queue: RR with time quantum 10ms
- PRIORITY BOOST at time 13 (time starts at zero)
- Show the CPU utilization time-line for 27 ms as ASCII art

(q3) Answer

- **Job A** (first in the ready queue initially):
  - CPU burst time 3ms (starts with a CPU burst), I/O burst time 1ms, doing I/O on the disk
- **Jobs B**:
  - CPU burst time ∞ ms (starts with a CPU burst), no I/O
- MLQ Scheduling:
  - Top-priority queue: RR with time quantum 5ms
  - Low-priority queue: RR with time quantum 10ms
- PRIORITY BOOST at time 13 (time starts at zero)
- Show the CPU utilization time-line for 27 ms as ASCII art

```
CPU  : AAABBBBBAAABAAABBBBBAAABAAA
Disk:     A       A   A       A
```