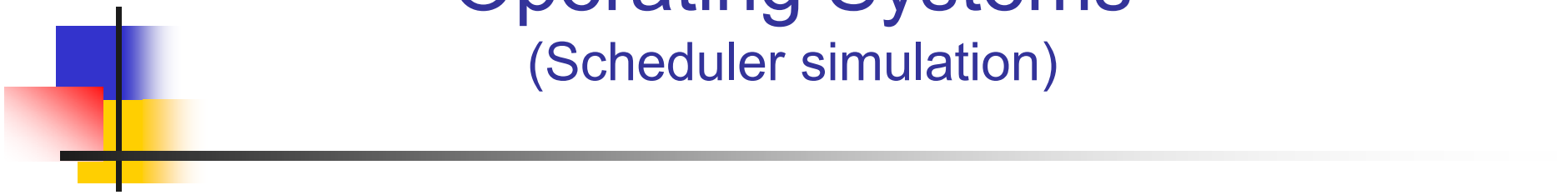
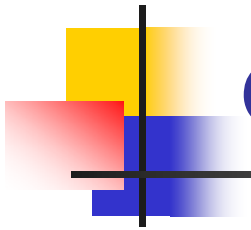


Operating Systems

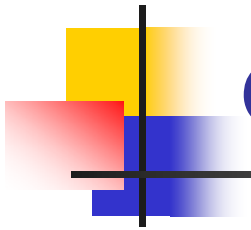
(Scheduler simulation)

Spring, 2018



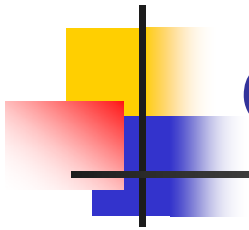
Outline

- Objectives
- Overview
- Linux scheduling
- What to do ?



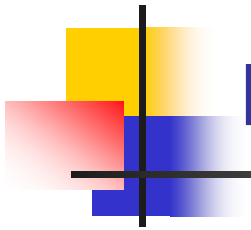
Objectives

- Understanding
  - How scheduler works
  - Scheduling simulation



Overview

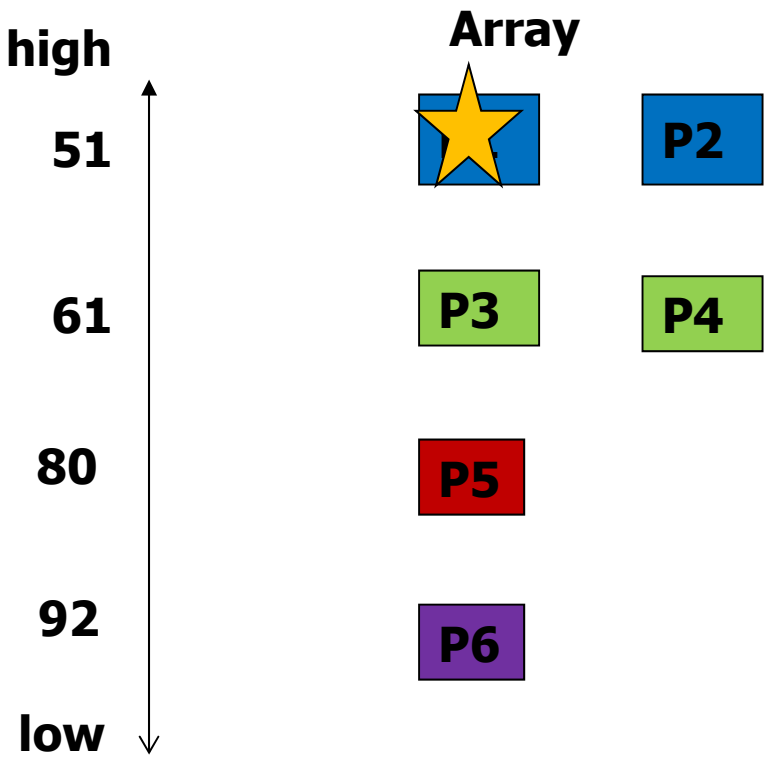
- Scheduler decides which task runs next
  - Generally after timer tick, the scheduler decides which task runs next
- What to do ?
  - Emulation of scheduling algorithms
  - Input file, output file

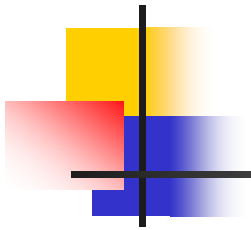


Linux scheduling

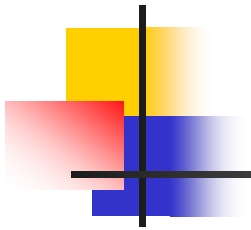
- Multi-level queue scheduling
  - 3 classes
    - 1. Real-time FIFO class
    - 2. Real-time RR class
    - 3. Conventional class
  - 1. Each queue has its own scheduling algorithm
  - 2. Scheduling must be done between the queues

- Real-time RR class
  - Each task has its time slot
  - If it expires, then it goes to the end of its priority queue

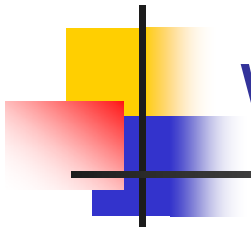




- Conventional class
  - Completely fair sharing scheduling
    - Weight is assumed to be allocated as follows:
      - 100 ~ 109: 10
      - 110 ~ 119: 8
      - 120 ~ 129: 6
      - 130 ~ 139: 4



- Scheduling across a queue
  - Priority scheduling !



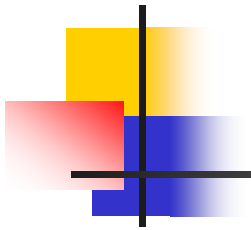
What to do ?

Input file

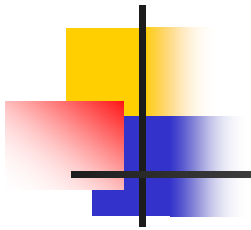
```
40 1 6
49 1 7
```

Output file

```
40 1 40 1 40 1 40 1 40 1 40 1
49 1 49 1 49 1 49 1 49 1 49 1 49 1
```

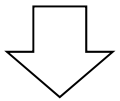


- Each task has its own priority
  - Linux has a priority between 0 and 139
  - Priority 0 is the highest, but 139 is the lowest
- Assumptions
  - Real-time RR class has priority between 0 and 99
    - Time slot: 2
  - Conventional class has priority between 100 and 139
    - No two or more tasks at the same priority
    - If the virtual time is equal, then higher priority task is selected at first
  - Every task is assumed to be ready at the same time

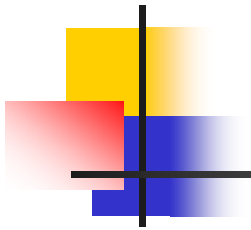


- Example 1

```
40 1 6
50 1 7
40 2 3
```

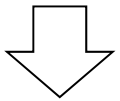


```
40 1 40 1 40 2 40 2 40 1 40 1 40 2 40 1 40 1
50 1 50 1 50 1 50 1 50 1 50 1 50 1 50 1
```

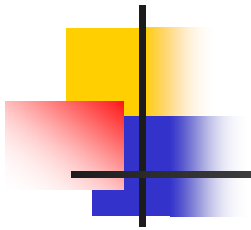


- Another example

```
40 1 6
102 1 2
113 1 2
```



```
40 1 40 1 40 1 40 1 40 1 40 1
102 1
113 1
102 1
113 1
```



- No submission after the deadline
- Deadline: May 16th 23:59