

COP4610 Spring 2006 Homework Assignment 3

The material for this homework assignment covers Chapters 5 to 7.

1. Which of the scheduling algorithms FCFS, SJF, RR, or Priority could result in starvation?
2. Consider the following set of processes, with the length of the CPU burst time and arrival time given in milliseconds:

<u>Process</u>	<u>Arrival time</u>	<u>Burst time</u>	<u>Priority</u>
P ₁	0	5	2
P ₂	2	3	1
P ₃	3	8	5
P ₄	3	1	4
P ₅	6	2	3

Draw the Gantt charts to illustrate the execution of the processes using the following scheduling algorithms:

FCFS

SJF (preemptive)

Priority (preemptive)

RR with quantum = 3

3. Determine the average waiting time of the processes for each of the scheduling algorithms in exercise 2.
4. Consider the following attempt to solve the mutual exclusion problem:

```
i = process_id(); // pid = 0 or 1
while (true)
{   while (turn == i)
        ; // no-op
    Critical section
    turn = 1-turn;
    Remainder section
}
```

Variable *turn* is shared with initial value 0 and variable *i* is private. Suppose we have two processes, P0 and P1, that want to enter the critical section.

Suppose we have only one process that wants to enter the critical section.

Describe why the process could deadlock.

5. Textbook exercise 6.8 at page 233.