Carleton University
Department of Systems and Computer Engineering
SYSC 3303 - Real-Time Concurrent Systems - Summer 2013

Assignment 5

1. Three logical processes P, Q, and S have the following characteristics: P: period 3, required execution time 1; Q: period 6, required execution time 3, S: period 18, required execution time 2.
    a. Show how these processes can be scheduled using the rate monotonic scheduling algorithm.
    b. Show how a cyclic executive could be constructed to implement the three logical processes.

2. Consider three processes P, Q, and S. P has a period of 100 ms in which it requires 15 ms of processing. The corresponding values for Q and S are (5, 1) and (25, 10) respectively.
    a. What is the processor utilization of P, Q, and S?
    b. If the processes were scheduled by a cyclic executive, would they meet their deadlines? Explain your answer.
    c. If the processes were scheduled using the rate monotonic scheduling algorithm, would they meet their deadlines? Explain your answer.

3. The process set shown here is not schedulable using the Liu/Layland utilization test but does meet all its deadlines. Explain why.

Process	Period	Execution Time
P1	70	30
P2	40	10
P3	20	5

Work Products

1. A "README.txt" file explaining the names of your file(s), software used, etc.
2. A file or files containing solutions to the above questions 1, 2, and 3. Hand-drawn scanned diagrams are acceptable, as long as they are neatly drawn and your handwriting is legible, and the software required to view them is present in the lab.

Reminder

The TAs will mark your assignments in the lab. It is your responsibility to ensure that any software required for viewing your files is also present in that lab.

Submitting Assignments

Assignments are to be submitted electronically using the assignment "submit" program. Emailed submissions will not be accepted. See the course outline for the procedure to follow if illness causes you to miss the deadline.

Due: Tuesday, June 11th at 8pm SHARP!