

ECE 697: Real-Time Systems Homework 1

Due February 20, 2007

(1) Use the necessary and sufficient conditions for RM-schedulability to check if each of the following task sets is RM-schedulable. If not, identify which tasks will miss their deadlines. ((a, b) means the period of the task is a and its worst-case execution time is b.) In each case, write out the necessary and sufficient conditions for each task to be schedulable.

(a) $\{(4, 1), (8, 3), (9, 1)\}$.

(b) $\{(2, 1), (3, 1)\}$.

(c) $\{(5, 1), (6, 2), (9, 5)\}$

(3) Find the maximum value of e_1 for which the task set $\{(5, e_1), (8, 4), (11, 1)\}$ is schedulable under the

(a) RM algorithm.

(b) EDF algorithm.

(4) Find a task set which is not schedulable under the RM algorithm but is schedulable under EDF. Assume that deadlines equal the periods in all tasks.

(5) Consider a task set consisting of periodic tasks, each of whose deadline is *greater* than its period. What would be the test of schedulability for such a system? (Note: We don't need to simulate the schedule over some finite period of time for this case).