

IMC4-1RT – TD 1

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Notations

Let us denote $\Psi = \{\tau_1, \dots, \tau_n\}$ a periodic realtime tasks set, each task τ_i being defined by a triplet (C_i, D_i, T_i) with C_i its worst case execution time (WCET), D_i its relative deadline and T_i its period.

1 Load condition

Using only the load condition, say, when it is possible, if the following system are schedulable under RM then under EDF :

1. $\Psi_1 = \{\tau_1(2, 5, 5), \tau_2(3, 15, 15)\}$
2. $\Psi_2 = \{\tau_1(2, 5, 5), \tau_2(2, 10, 10), \tau_3(3, 20, 20)\}$
3. $\Psi_3 = \{\tau_1(3, 5, 5), \tau_2(3, 10, 10), \tau_3(3, 20, 20)\}$
4. $\Psi_4 = \{\tau_1(1, 4, 4), \tau_2(3, 5, 5), \tau_3(1, 10, 10)\}$

2 Work Demand Study

Considering $\Psi = \{\tau_1(1, 3, 3), \tau_2(2, 4, 4), \tau_3(1, 8, 8)\}$. Conclude on the schedulability of Ψ under RM using the demand analysis algorithm for each priority level.

3 Chronogram, optimality and worst case response times

Considering $\Psi = \{\tau_1(3, 5, 5), \tau_2(2, 8, 9), \tau_3(2, 4, 12)\}$.

1. Draw the chronogram of the schedule produces by EDF on Ψ in time interval $[0, 15[$ (considering a synchronous activation at time $t = 0$)
2. Same question with DM.
3. is Ψ schedulable by a fixed priority algorithm ?
4. we want to change deadlines of tasks to obtain Ψ^* schedulable with RM, without modifying the periods. To find the new deadline, you have to compute the worst case response times of each tasks.