SCHEDULING ANALYSIS

RTOS TASK

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TEAM 4

Overview

- **Task:** Schedule the following task set using rate-monotonic:

    T1 {P: 5, E: 2.5, D: 5}, T2 {P: 15, E: 4.5, D: 15}, T3 {P: 20, E: 3.5, D: 20}
    - Calculate the Urm.
    - Calculate the time-demand analysis.
    - Model the task set using Simso.
    - **Provide a report with the above points using screenshots and comments on your results and analysis.**

Goals

- Calucalate the URM.
- Calculate the time-demand analysis.
- Model the task set using Simso.

Tasks in system

The following table 1 is shown the tasks with each (Periodicity, Deadline, Execution time)
The task with Higher number has higher priority.

Task id	Periodicity	Deadline	Execution time
T1	5	5	2.5
T2	15	15	4.5
T3	20	20	3.5

Hyperperiod

Hyperperiod = LCM (tasks periodicity) =LCM (20,5,15) = 60

URM

Task id	Periodicity(ms)	Execution Time(ms)	U
T1	2.5	5	2.5/5 = 0.5
T2	4.5	15	4.5/15 = 0.3
T3	3.5	20	3.5/20=0.175
TOTAL			0.975

URM = $N(2^{1/N} - 1)$
    = 3*(2^(1/3) -1) = 0.799
:- U > URM, the system need test
   1. Time required for T1 is W1(5) = 2.5 + 0 = 2.5ms
        • **2.5 < 5 (T1 is schedulable)**
   2. Time required for T2 is W2(15) = 4.5 + (2.5*3) = 12ms
        • **12.5 <15 (T2 is schedulable)**
   3. Time required for T3 is W3(20) = 3.5 + (4.5*2) + (2.5*4) = 22.5ms
        • **22.5 > 20 (T3 is not schedulable)**

Simso

e	Task type	Abort on miss	Act. Date (ms)	Period (ms)	List of Act. dates (ms)	Deadline (ms)	WCET (ms)	Followed by	priority
T1	Periodic ▾	☑ Yes	0	5.0	-	2.0	2.5	▾	1
T2	Periodic ▾	☑ Yes	0	15.0	-	15.0	4.5	▾	1
T3	Periodic ▾	☑ Yes	0	20.0	-	20.0	3.5	▾	1

Edit data fields...

Remove selected task(s)   Add task   Generate Task Set

Qt Results

General | Logs | Tasks | Scheduler | Processors

Observation Window:

from 0.00 to 100.00 ms   Configure...

	Total load	Payload	System load
CPU 1	0.4550	0.4550	0.0000
Average	0.4550	0.4550	0.0000