Assignment 4 – Sporadic and aperiodic tasks

Part 1. EDF Simulation

Exercise 1. Consider the tasks T1(3, 0.5), T2(4, 1.5, 3), T3(7, 1.0, 5) and the EDF scheduler. A sporadic job arrives at t=50 having the execution time of 10 and a relative deadline of 30.

A picture containing table

Description automatically generated

**What is the minimum/maximum/average response time of all tasks?**

Table

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**Is any task missing the deadline? Which task? Where?**

No task is missing it’s deadline

**Is the sporadic job meeting its deadline?**

Yes

**What is the response time for the sporadic job?**

29ms, just 1 ms before it’s deadline

Part 2. RM Simulation

Exercise 2. Consider the tasks T1(3, 0.5), T2(4, 1.5, 3), T3(7, 1.0, 5) and the RM scheduler. A sporadic job arrives at t=50 having the execution time of 10 and a relative deadline of 30.

A picture containing diagram

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**What is the minimum/maximum/average response time of all tasks?**

Table

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**Is any task missing the deadline? Which task? Where?**

No, only the sporadic

**Is the sporadic job meeting its deadline?**

No, sporadic is still missing 0.5ms computation tine by it’s deadline of 80ms

**What is the response time for the sporadic job?**

30.5ms

**Which scheduler is better is better in this example; EDF or RM?**

EDF is better in this example because it manages to keep all the tasks running and the sporadic job.

Part 2. Programming

Here create a task "matrixtask" containing the functionality given in Assignment 2.

Add a software timer in main() to trigger a software interrupt every 5 seconds.

Define a Timer callback function outside main()

Create an aperiodic task()

Original code running before any fix.

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The following questions should be solved with programming and the questions should be answered in a report:

Is the system fast enough to handle all aperiodic tasks? Why?

No, response time of the aperiodic job takes longer than 5s, it’s creation time.

If not, solve this problem without alter the functionality of any task

I changed the priority of the aperiodic task, to be able to finish the job. The downside is that the matrix operation is postponed and now the interrupted matrix operation takes 1700mS instead of 900mS.

What is the response time of the aperiodic task?

Modified code. Modified response time is now 800mS

Provide a screenshot of the running system

Text

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