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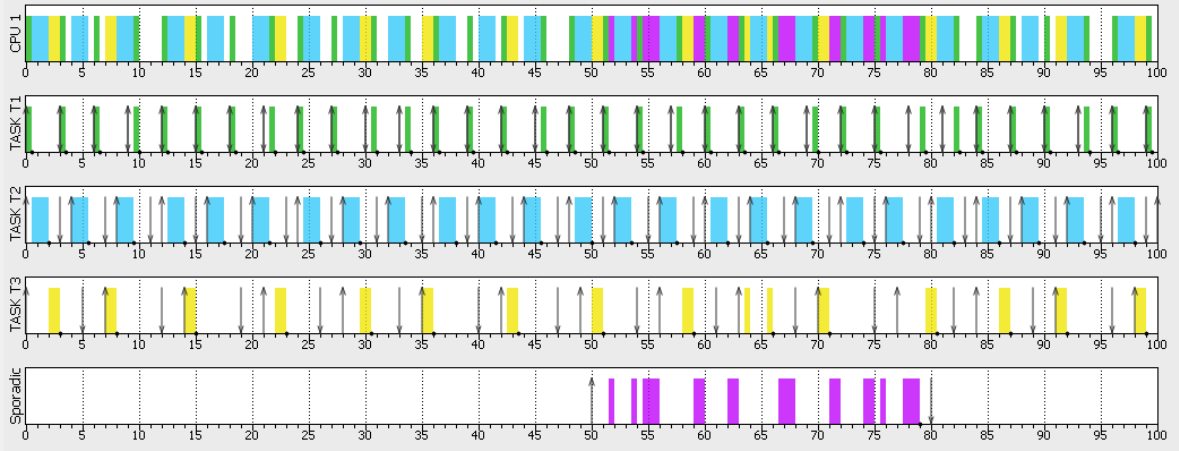
Assignment 4 – Sporadic and aperiodic tasks

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.



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

Response time:

Task	min	avg	max	std dev
TASK T1	0.500	0.676	1.500	0.294
TASK T2	1.500	1.700	2.000	0.245
TASK T3	1.000	1.967	3.500	0.921
Sporadic	29.000	29.000	29.000	0.000

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

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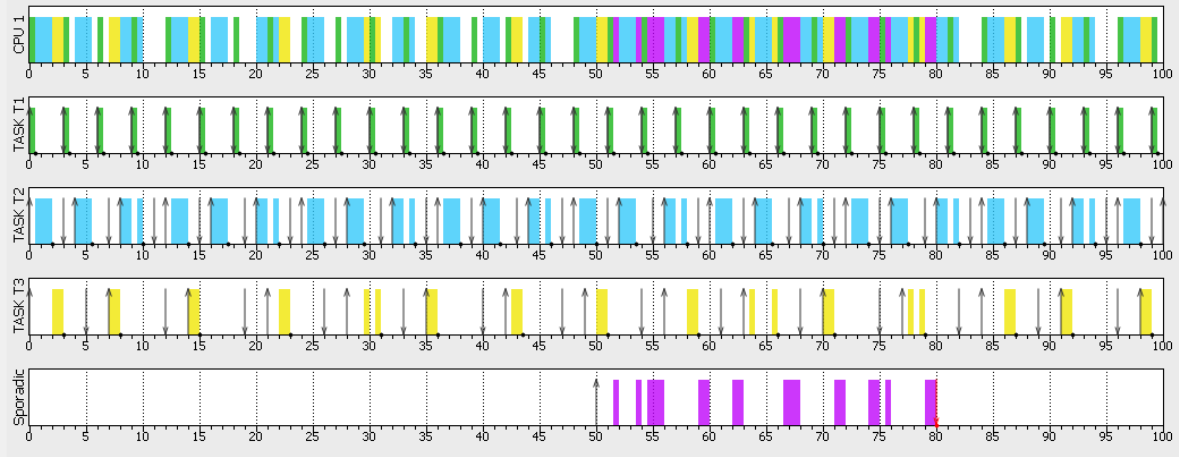
Part 2. RM Simulation

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.



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

Response time:

Task	min	avg	max	std dev
TASK T1	0.500	0.500	0.500	0.000
TASK T2	1.500	1.840	2.000	0.233
TASK T3	1.000	1.900	3.000	0.860
Sporadic				

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.

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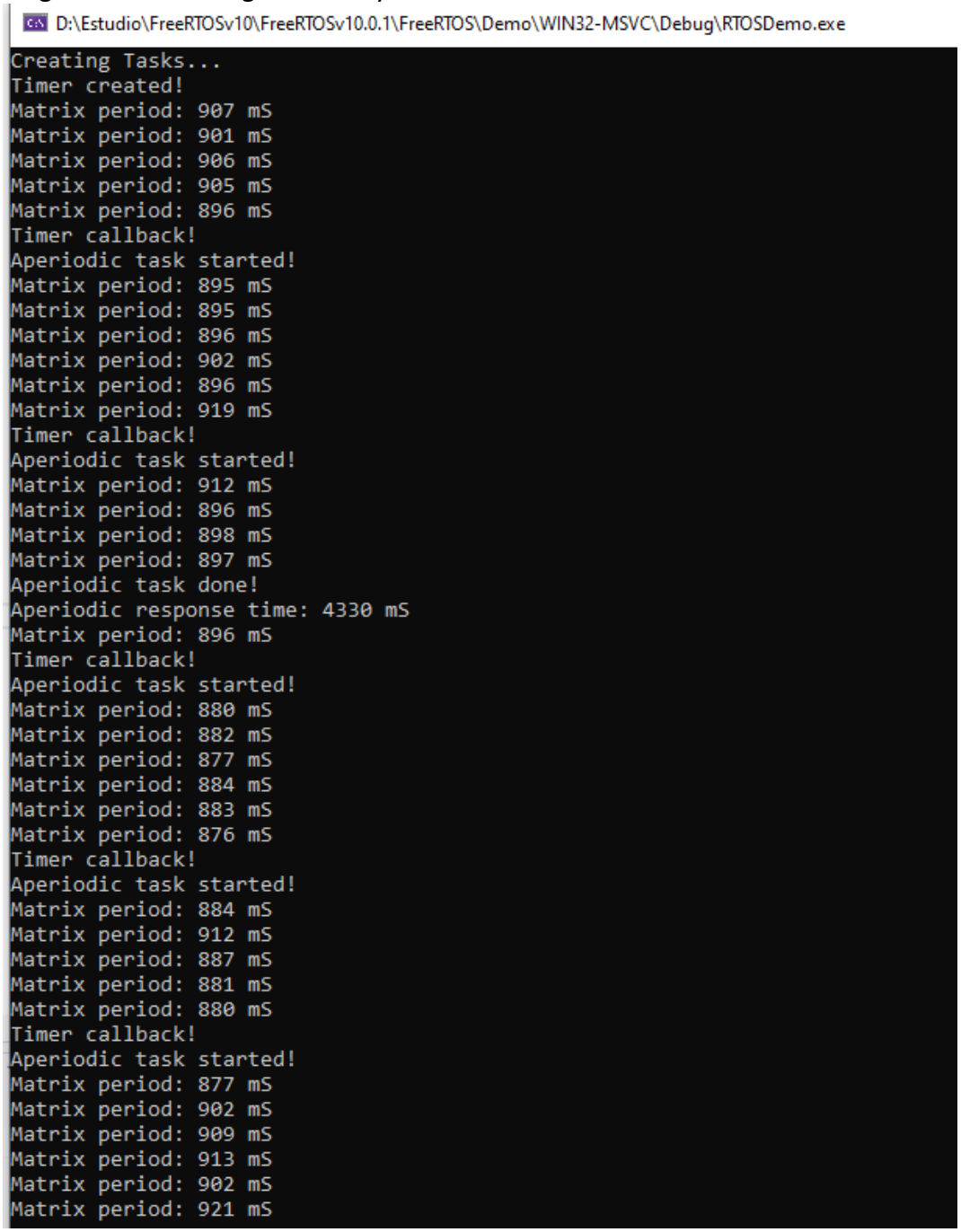
Part 2. Programming
Here create a task "matrixtask" containing the functionality given in Assignment 2.
Add a software timer in main() to trigger a software interrupt every 5 seconds.
Define a Timer callback function outside main()
Create an aperiodic task()

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