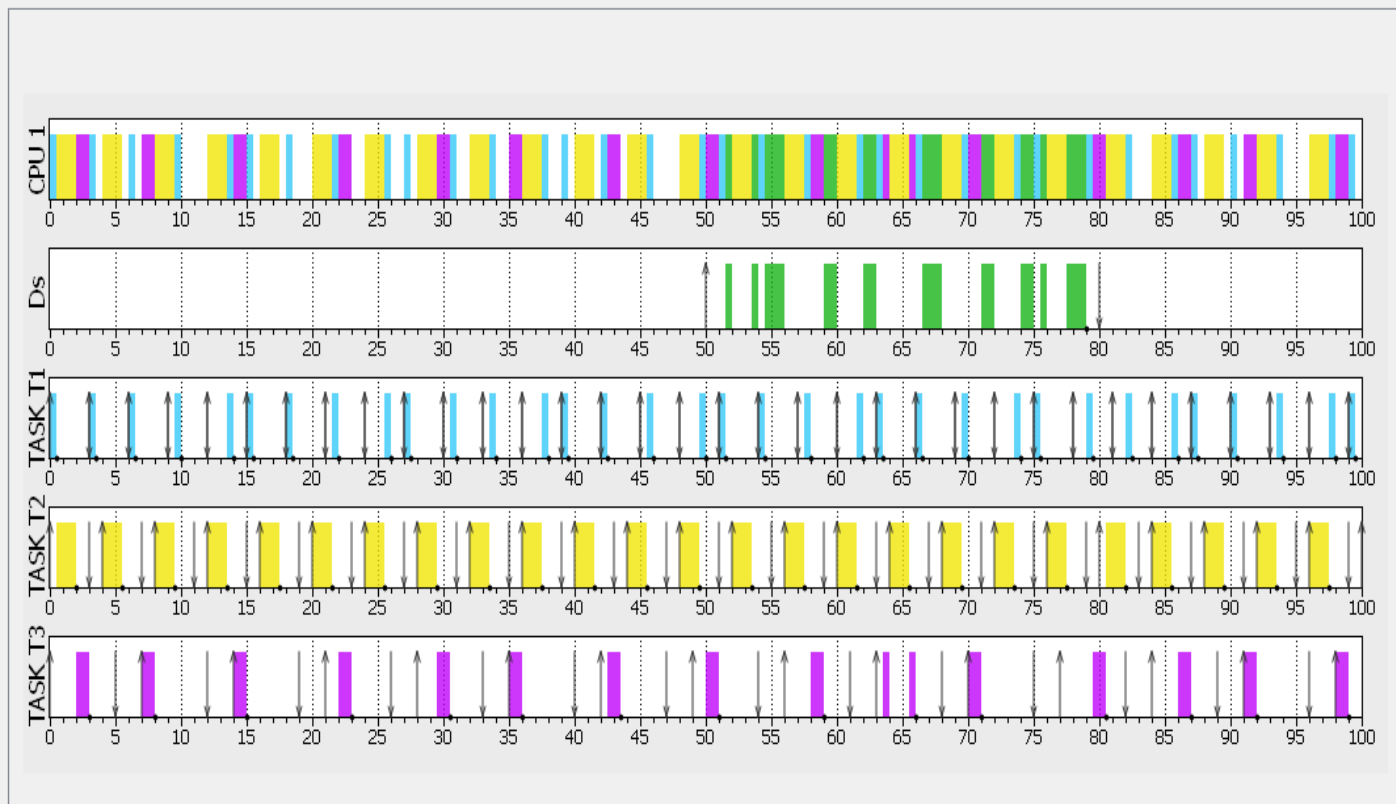
Development of Real-Time Systems – Assignment 4

Simulation Assignment:

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. Create the sporadic task in SimSo by selecting: ”generate task set” and then list of act. Dates to the release time.



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

A:

Task	min	avg	max	std dev	occupancy
Ds	10.000	10.000	10.000	0.000	0.100
TASK T1	0.500	0.500	0.500	0.000	0.170
TASK T2	1.500	1.500	1.500	0.000	0.375
TASK T3	1.000	1.000	1.000	0.000	0.150

2. Is any task missing the deadline? Which task? Where?

A: No.

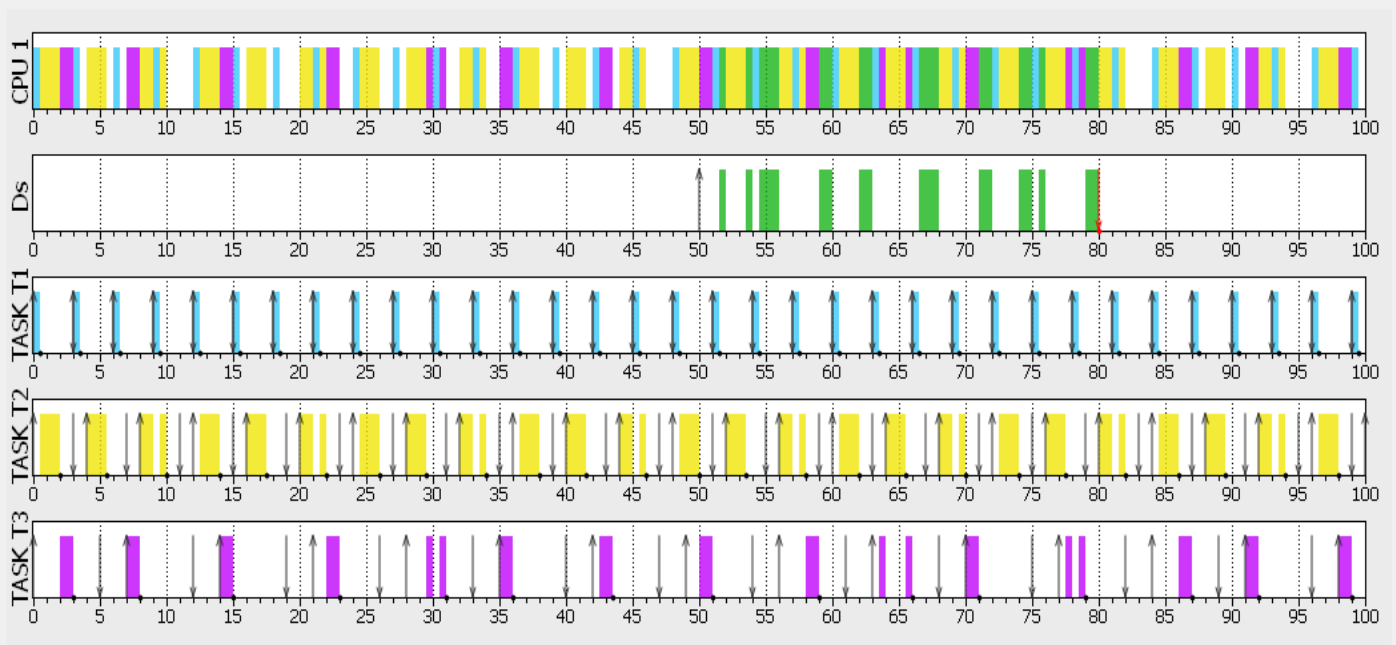
3. Is the sporadic job meeting its deadline?

A: Yes.

4. What is the response time for the sporadic job?

A: 10 ms

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. Create the sporadic task in SimSo by selecting: ”generate task set” and then list of act. Dates to the release time



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

A :

Computation time:

Task	min	avg	max	std dev	occupancy
TASK T1	0.500	0.500	0.500	0.000	0.170
TASK T2	1.500	1.500	1.500	0.000	0.375
TASK T3	1.000	1.000	1.000	0.000	0.150

2. Is any task missing the deadline? Which task? Where?

A: Yes. Sporadic Task. At time 80

3. Is the sporadic job meeting its deadline?

A: No.

4. What is the response time for the sporadic job?

A: It is missing its deadline.

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

A: EDF

Programming Assignment:

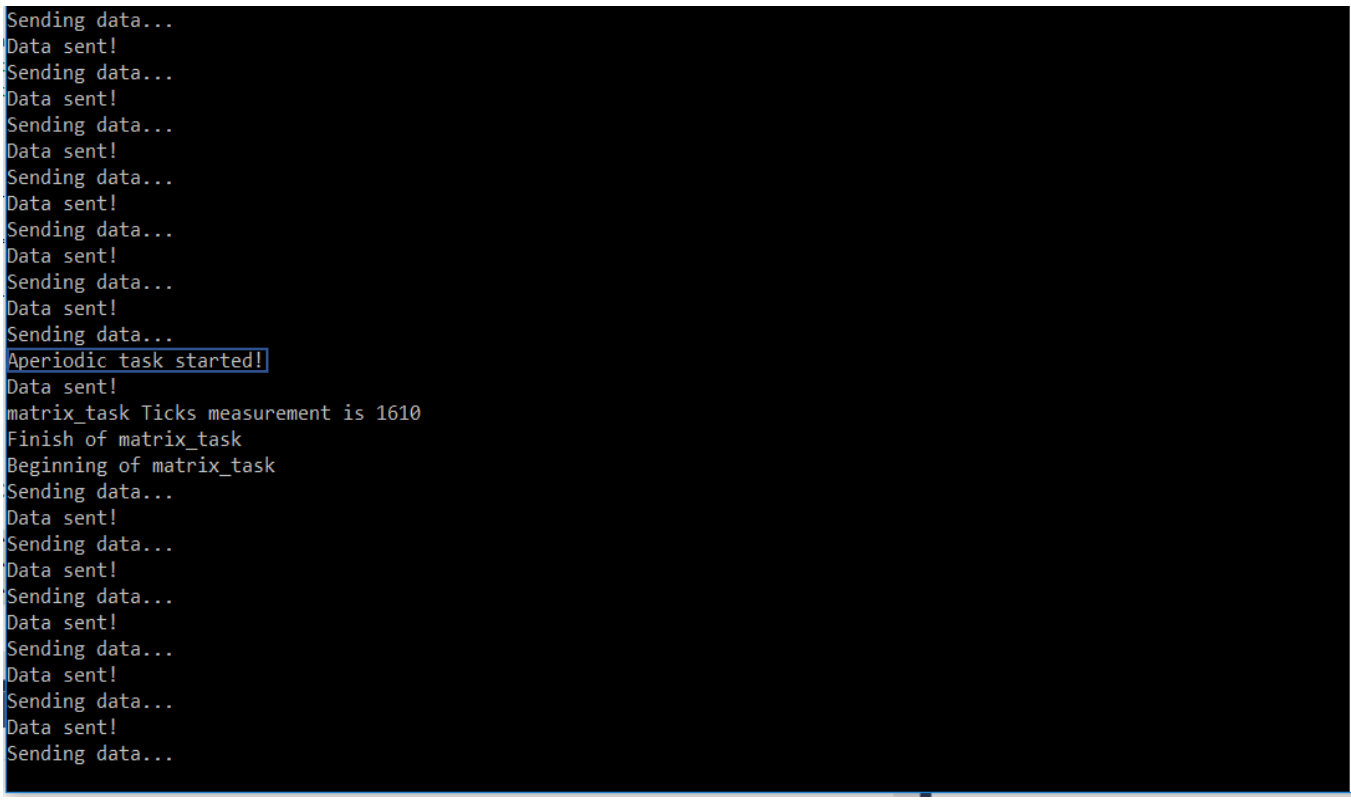


Fig (a)

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

A : No. Because the aperiodic task is of lower priority compared to other available periodic tasks.

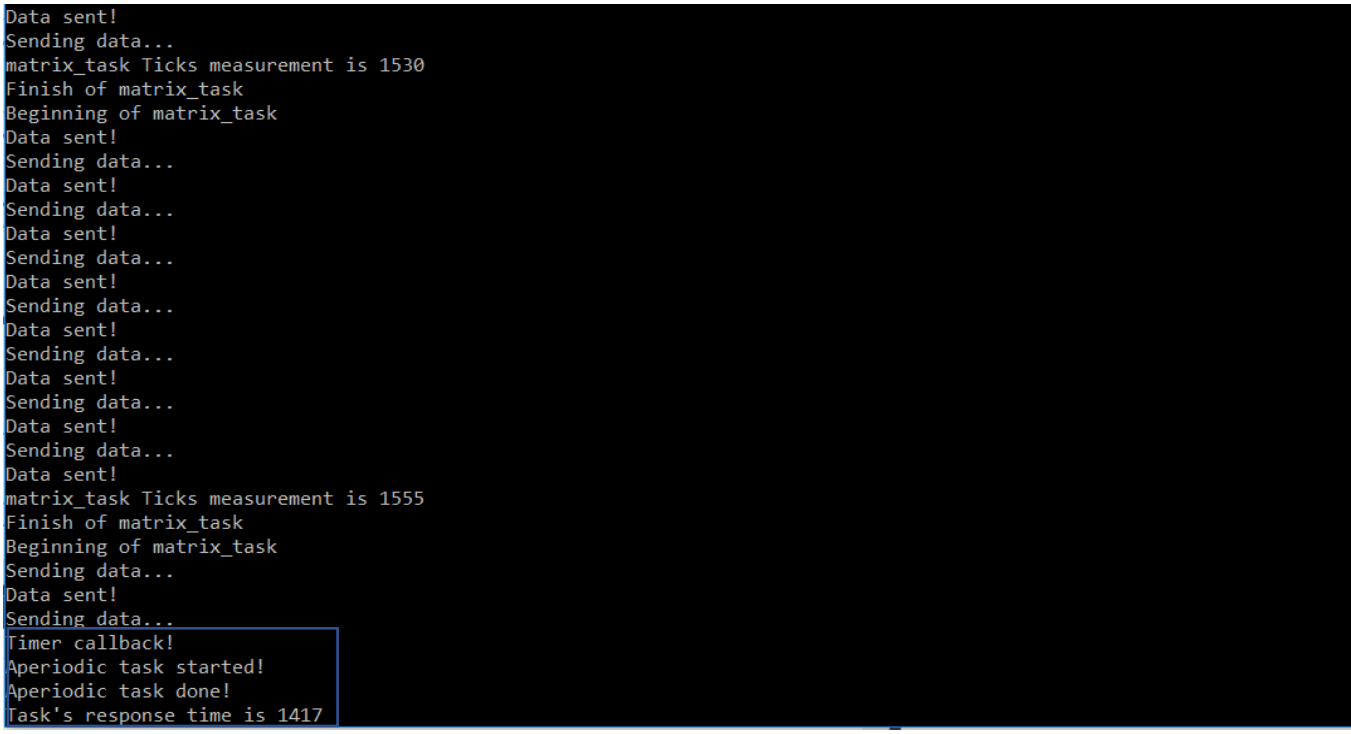


Fig (b)

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

A : When the aperiodic task's priority is being raised above all other available tasks' then the given aperiodic task is being completely executed.

3 . What is the response time of the aperiodic task?

A : The response time of an aperiodic task is 1417ms.

4 . Provide a screenshot of the running system

A : Fig (b)