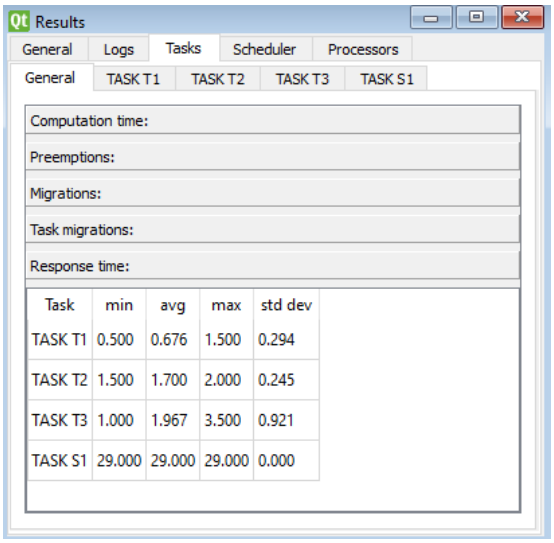
Assignment 4

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

-Use SimSo to schedule the task set and provide a report answering the following questions:

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

Ans:



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

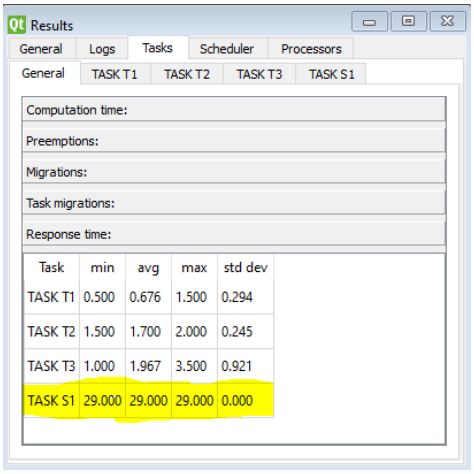
Ans: No, all the tasks meet the deadline.

- Is the sporadic job meeting its deadline?

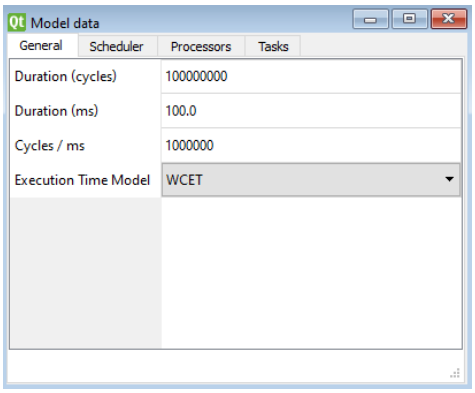
Ans: Sporadic Job meets the deadline.

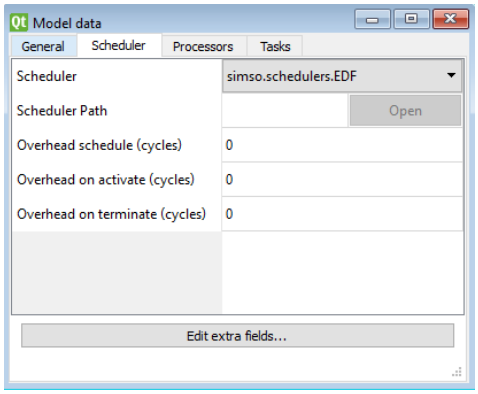
- What is the response time for the sporadic job?

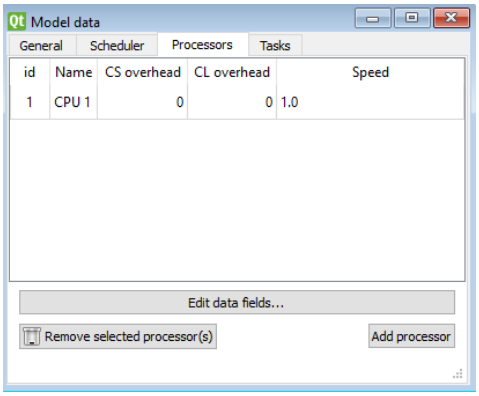
Ans: Response time for sporadic job is = (79-50) = 29

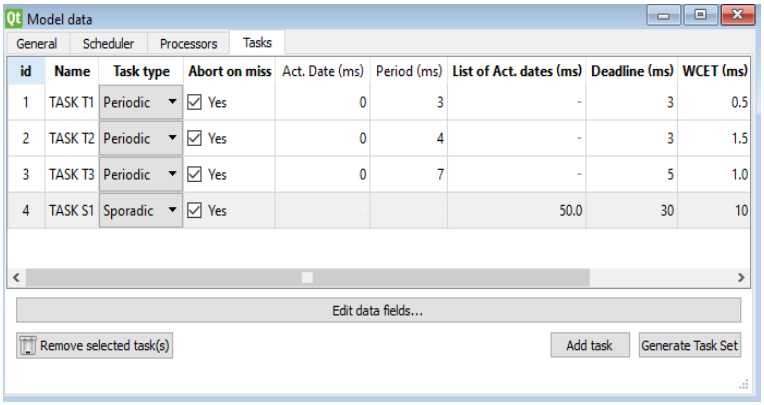


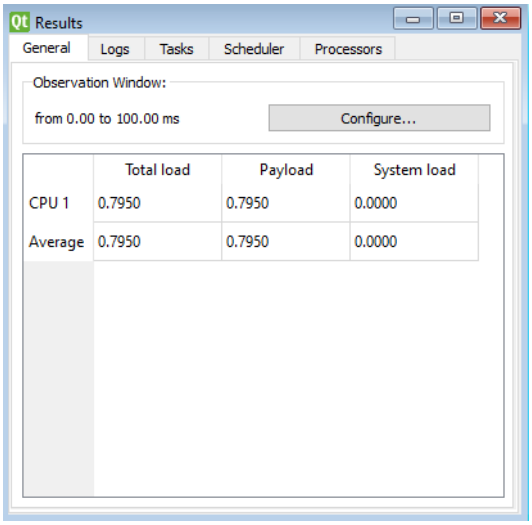
Solution 1:

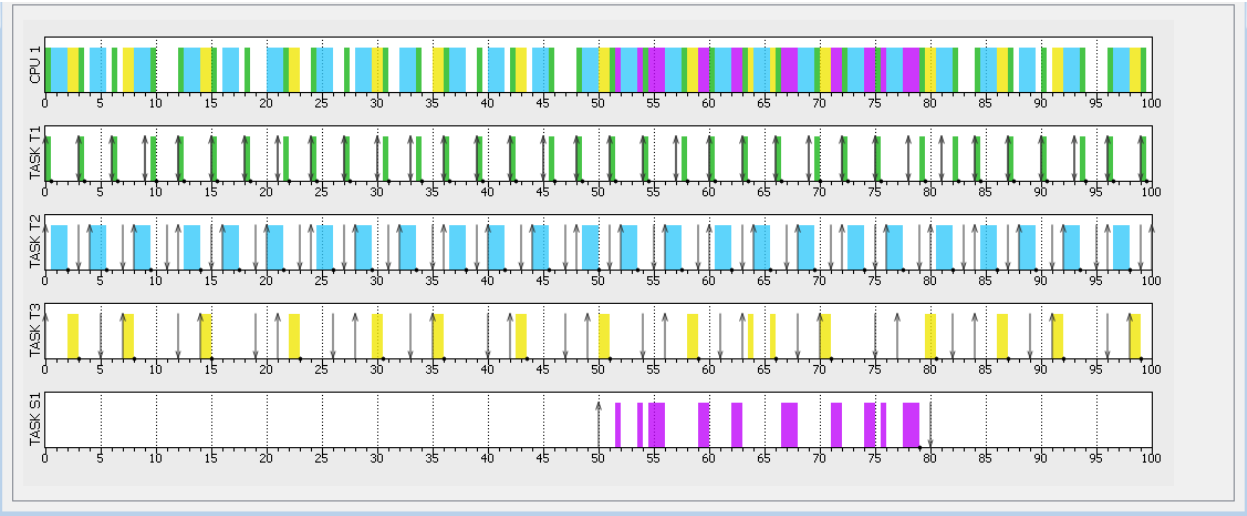

Model data
General
Scheduler
Processors
Tasks
Duration (cycles)
100000000
Duration (ms)
100.0
Cycles / ms
1000000
Execution Time Model
WCET


Model data
General
Scheduler
Processors
Tasks
Scheduler
simso.schedulers.EDF
Scheduler Path
Open
Overhead schedule (cycles)
0
Overhead on activate (cycles)
0
Overhead on terminate (cycles)
0
Edit extra fields...


Model data
General
Scheduler
Processors
Tasks
id
Name
CS overhead
CL overhead
Speed
1
CPU 1
0
0
1.0
Edit data fields...
Remove selected processor(s)
Add processor


Model data
General
Scheduler
Processors
Tasks
id
Name
Task type
Abort on miss
Act. Date (ms)
Period (ms)
List of Act. dates (ms)
Deadline (ms)
WCET (ms)
1
TASK T1
Periodic
Yes
0
3
-
3
0.5
2
TASK T2
Periodic
Yes
0
4
-
3
1.5
3
TASK T3
Periodic
Yes
0
7
-
5
1.0
4
TASK S1
Sporadic
Yes
50.0
30
10
Edit data fields...
Remove selected task(s)
Add task
Generate Task Set


Results
General
Logs
Tasks
Scheduler
Processors
Observation Window:
from 0.00 to 100.00 ms
Configure...
Total load
Payload
System load
CPU 1
0.7950
0.7950
0.0000
Average
0.7950
0.7950
0.0000

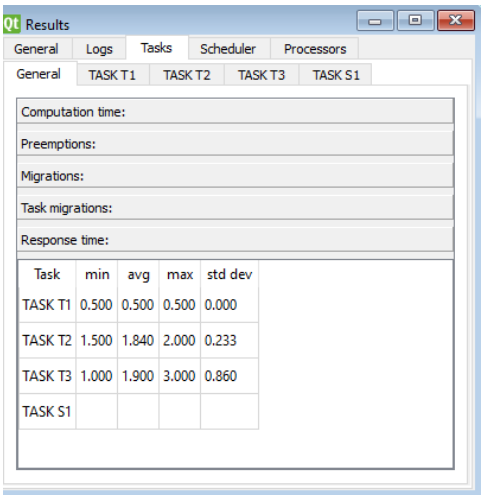


Consider the tasks T1(3, 0.5), T2(4, 1.5, 3), T3(7, 1.0, 5) and the RM scheduler. A sporadic job arrives at t=50 having the execution time of 10 and a relative deadline of 30. Create the sporadic task in SimSo by selecting: ”generate task set” and then list of act. Dates to the release time

-Use SimSo to schedule the task set and provide a report answering the following questions:

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

Ans:



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
TASK S1				

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

Yes

Date (cycles)	Date (ms)	Message
78500000	78.5	TASK T1_27 Terminated.
78500000	78.5	TASK T3_12 Executing on CPU 1
79000000	79.0	TASK T3_12 Terminated.
79000000	79.0	TASK S1_1 Executing on CPU 1
80000000	80.0	Job TASK S1_1 aborted! ret:0.5
80000000	80.0	TASK T2_21 Activated.
80000000	80.0	TASK T2_21 Executing on CPU 1
81000000	81.0	TASK T1_28 Activated.
81000000	81.0	TASK T2_21 Preempted! ret: 500000
81000000	81.0	TASK T1_28 Executing on CPU 1
81500000	81.5	TASK T1_28 Terminated.

- Is the sporadic job meeting its deadline?

Ans: No it is missing the deadline.

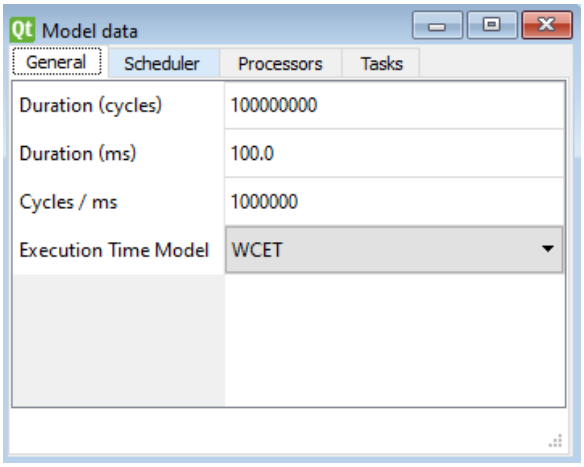
- What is the response time for the sporadic job?

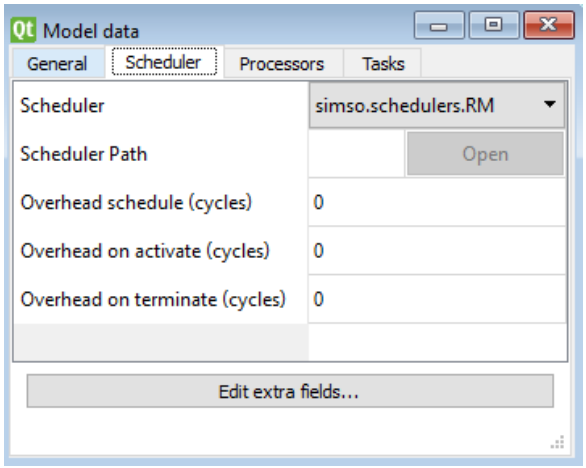
Ans: Task was aborted so there was no response time was logged

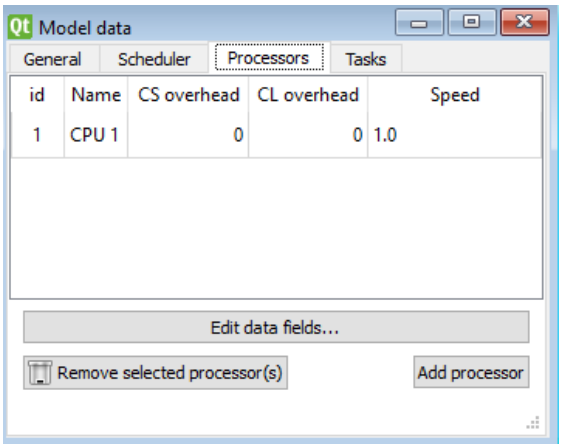
- Which scheduler is better is better in this example; EDF or RM?

Ans: EDM is better in this case.

Solution 2:







Model data

General | Scheduler | Processors | Tasks

id	Name	Task type	Abort on miss	Act. Date (ms)	Period (ms)	List of Act. dates (ms)	Deadline (ms)	WCET (ms)
1	TASK T1	Periodic	Yes	0	3	-	3	0.5
2	TASK T2	Periodic	Yes	0	4	-	3	1.5
3	TASK T3	Periodic	Yes	0	7	-	5	1.0
4	TASK S1	Sporadic	Yes	-	-	50.0	30	10

Edit data fields...

Remove selected task(s) | Add task | Generate Task Set

Result

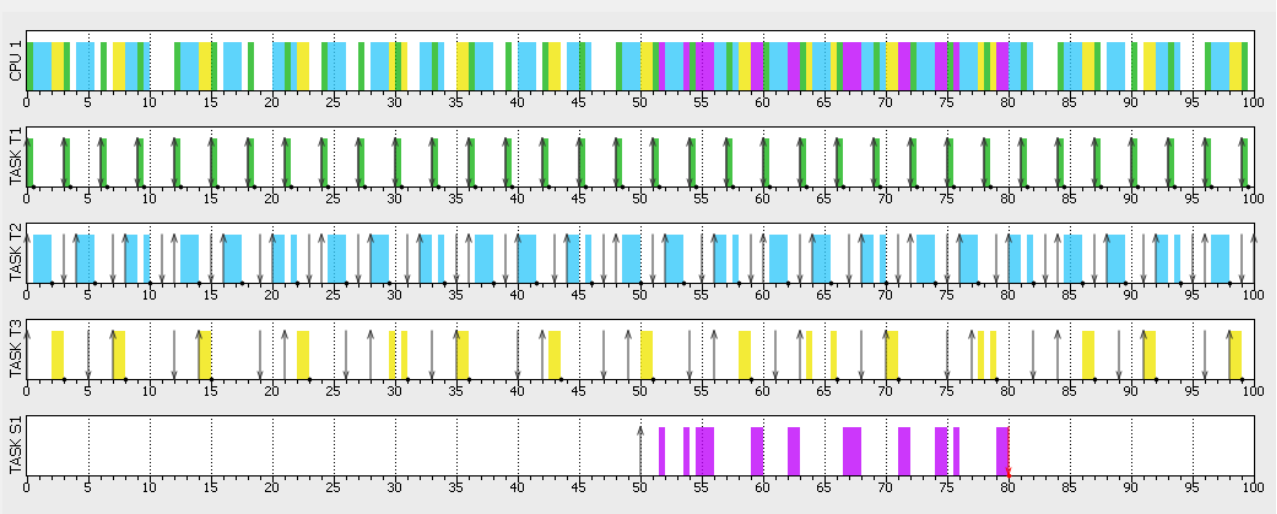
Results

General | Logs | Tasks | Scheduler | Processors

Observation Window:

from 0.00 to 100.00 ms | Configure...

	Total load	Payload	System load
CPU 1	0.7900	0.7900	0.0000
Average	0.7900	0.7900	0.0000



Coding Solution

The code is attached in “main.c” file

Result

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

Ans: No the “Matrix Task” takes most of the computation power hence the system is not fast enough for aperiodic task.

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

Ans: Yes we can solve the issue by giving the aperiodic task a higher priority.

- What is the response time of the aperiodic task?

Ans: Approximately 2.2 seconds show in the screen shot below.

- Provide a screenshot of the running system

Ans: