

Coursera's Development of Real-Time Systems Peer-graded Assignment: Assignment 3

Requirement

Input the tasks T1(2, 0.5), T2(3, 1.2), T3(6, 0.5) and the RM scheduler into the SimSo simulator

-Use SimSo to schedule the task set

Provide a report answering the following questions:

- What is the utilization factor of the system and what is the value for $U_{rm}(3)$
- What is the minimum/maximum/average response time of all tasks?
- Is any task missing the deadline? Which task? Where?
- If a deadline is missed, could it be avoided by changing the scheduler?

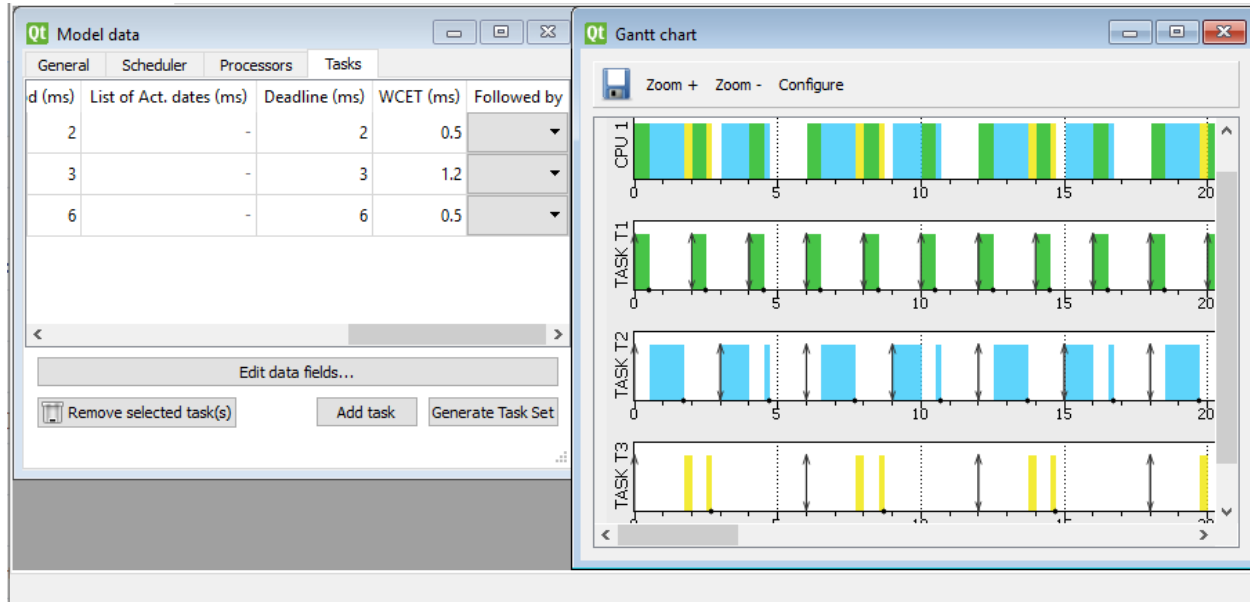
Input the tasks T1(2, 0.5, 1.9) T2(5, 2) T3(1, 0.1, 0.5) T4(10, 5, 20) and the EDF scheduler into the SimSo simulator

-Use SimSo to schedule the task set

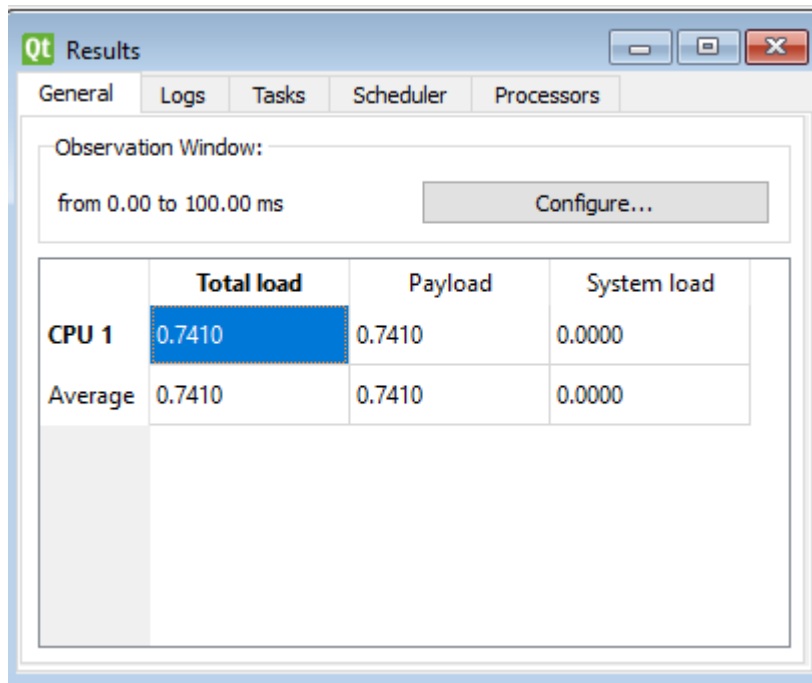
Provide a report answering the following questions:

- What is the utilization factor of the system and what is the value for $U_{rm}(4)$
- What is the minimum/maximum/average response time of all tasks?
- Is any task missing the deadline? Which task? Where?
- If a deadline is missed, could it be avoided by changing the scheduler?

Task1- RM Scheduler

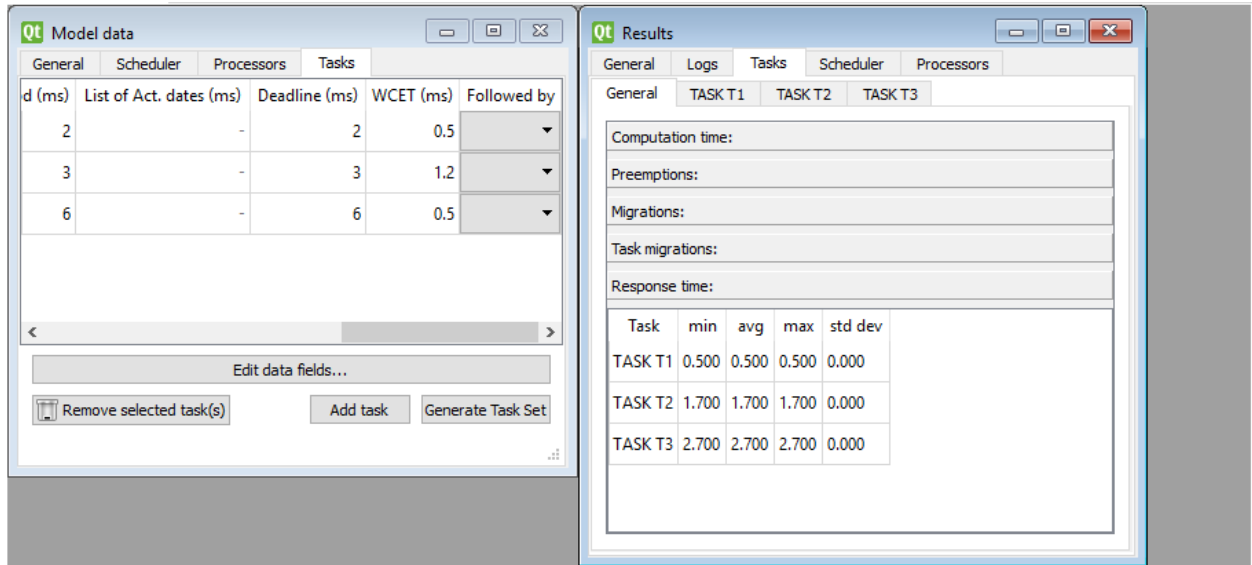


- What is the utilization factor of the system and what is the value for $U_{rm}(3)$



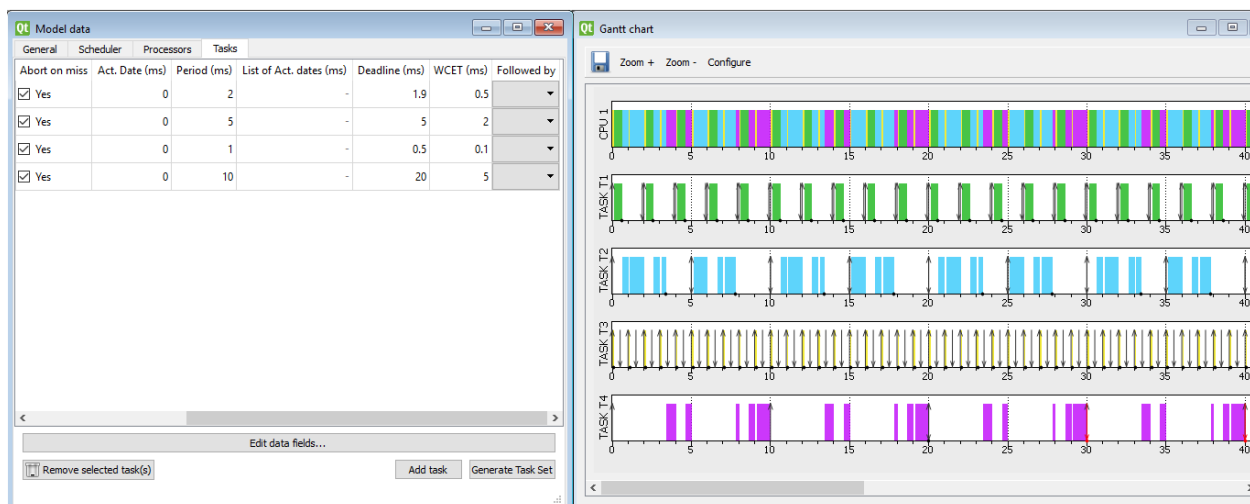
- $U = 0.741$
- $U_{rm}(3) = 0.77976314968$ as $U \leq U_{rm}$ and $U_{rm}(n) = n(2^{1/n} - 1)$

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



- Is any task missing the deadline? Which task? Where?
 - No deadline is missed
- If a deadline is missed, could it be avoided by changing the scheduler?
 - No deadline is missed

Task2 – EDF Scheduler



- What is the utilization factor of the system and what is the value for $U_{rm}(4)$

Qt Results window showing system utilization data. The Observation Window is set from 0.00 to 100.00 ms. The table below shows the utilization for CPU 1 and the Average.

	Total load	Payload	System load
CPU 1	1.0000	1.0000	0.0000
Average	1.0000	1.0000	0.0000

- $U=1$ && $U_{rm} = 0.756828460$ System isn't Feasible

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

Qt Model data window showing task parameters:

Abort on miss	Act. Date (ms)	Period (ms)	List of Act. dates (ms)	Deadline (ms)	WCET (ms)	Followed by
<input checked="" type="checkbox"/> Yes	0	2	-	1.9	0.5	
<input checked="" type="checkbox"/> Yes	0	5	-	5	2	
<input checked="" type="checkbox"/> Yes	0	1	-	0.5	0.1	
<input checked="" type="checkbox"/> Yes	0	10	-	20	5	

Qt Results window showing response times:

Task	min	avg	max	std dev
TASK T1	0.600	0.600	0.600	0.000
TASK T2	2.800	3.100	3.400	0.300
TASK T3	0.100	0.100	0.100	0.000
TASK T4	20.000	20.000	20.000	0.000

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

Qt Scheduler window showing task parameters (same as above):

Abort on miss	Act. Date (ms)	Period (ms)	List of Act. dates (ms)	Deadline (ms)	WCET (ms)	Followed by
<input checked="" type="checkbox"/> Yes	0	2	-	1.9	0.5	
<input checked="" type="checkbox"/> Yes	0	5	-	5	2	
<input checked="" type="checkbox"/> Yes	0	1	-	0.5	0.1	
<input checked="" type="checkbox"/> Yes	0	10	-	20	5	

Qt Logs window showing task execution logs:

Date (cycles)	Date (ms)	Message
29100000	29.1	TASK T4_2 Executing on CPU 1
30000000	30.0	Job TASK T4_2 aborted! ret:2.5
30000000	30.0	TASK T4_4 Activated.
30000000	30.0	TASK T2_7 Activated.

- Task 4 missed deadline at ($t = 30, 40, 50, 60, 70, 80, 90, 100$)

- If a deadline is missed, could it be avoided by changing the scheduler? No

