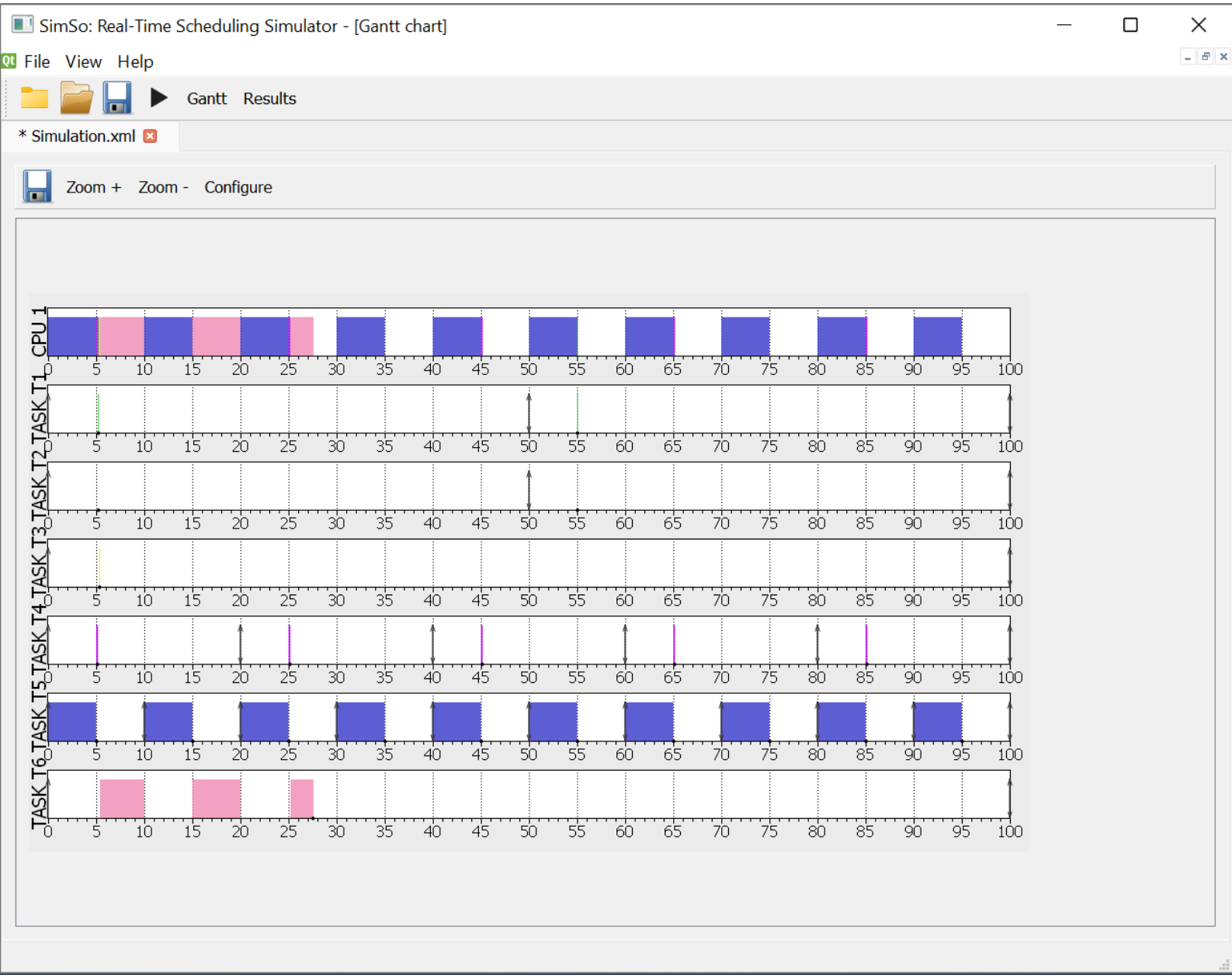
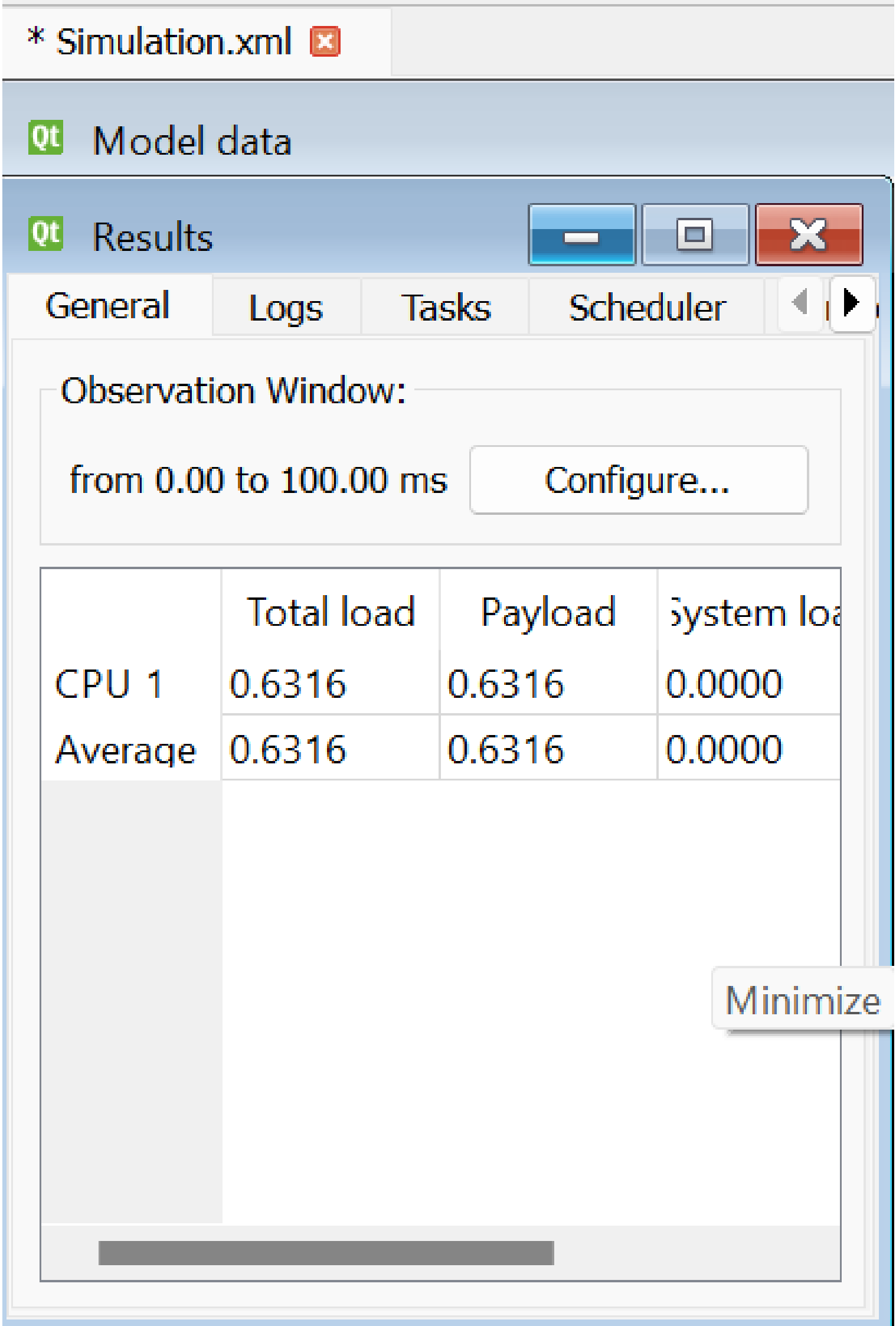
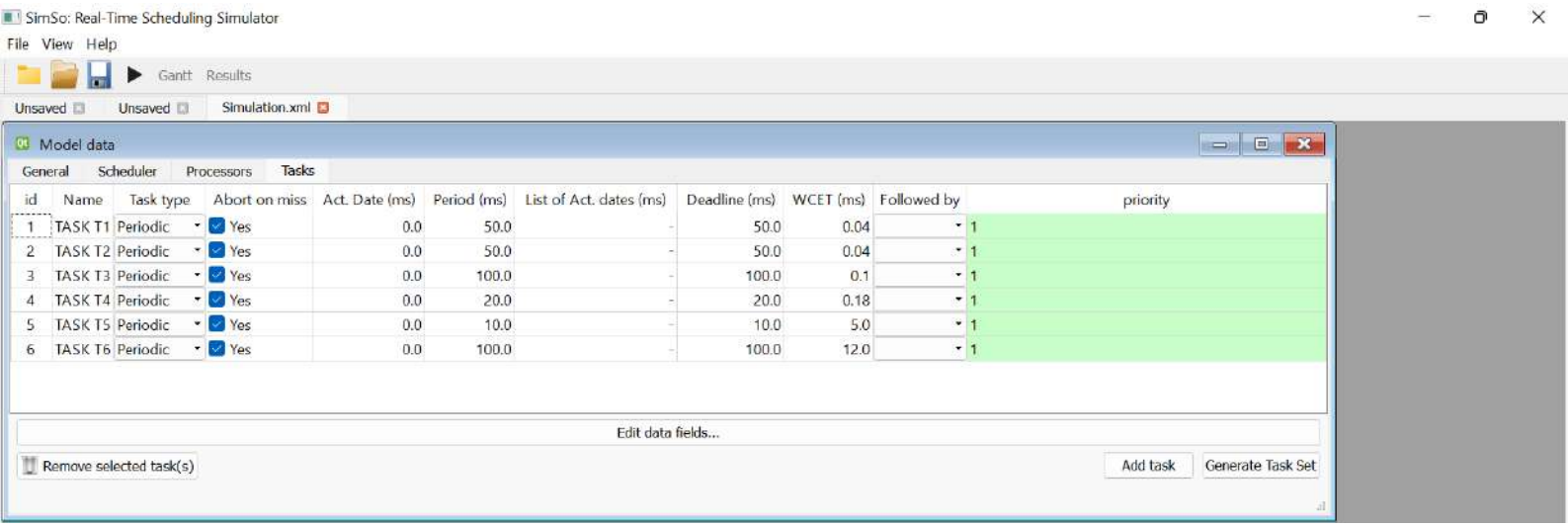
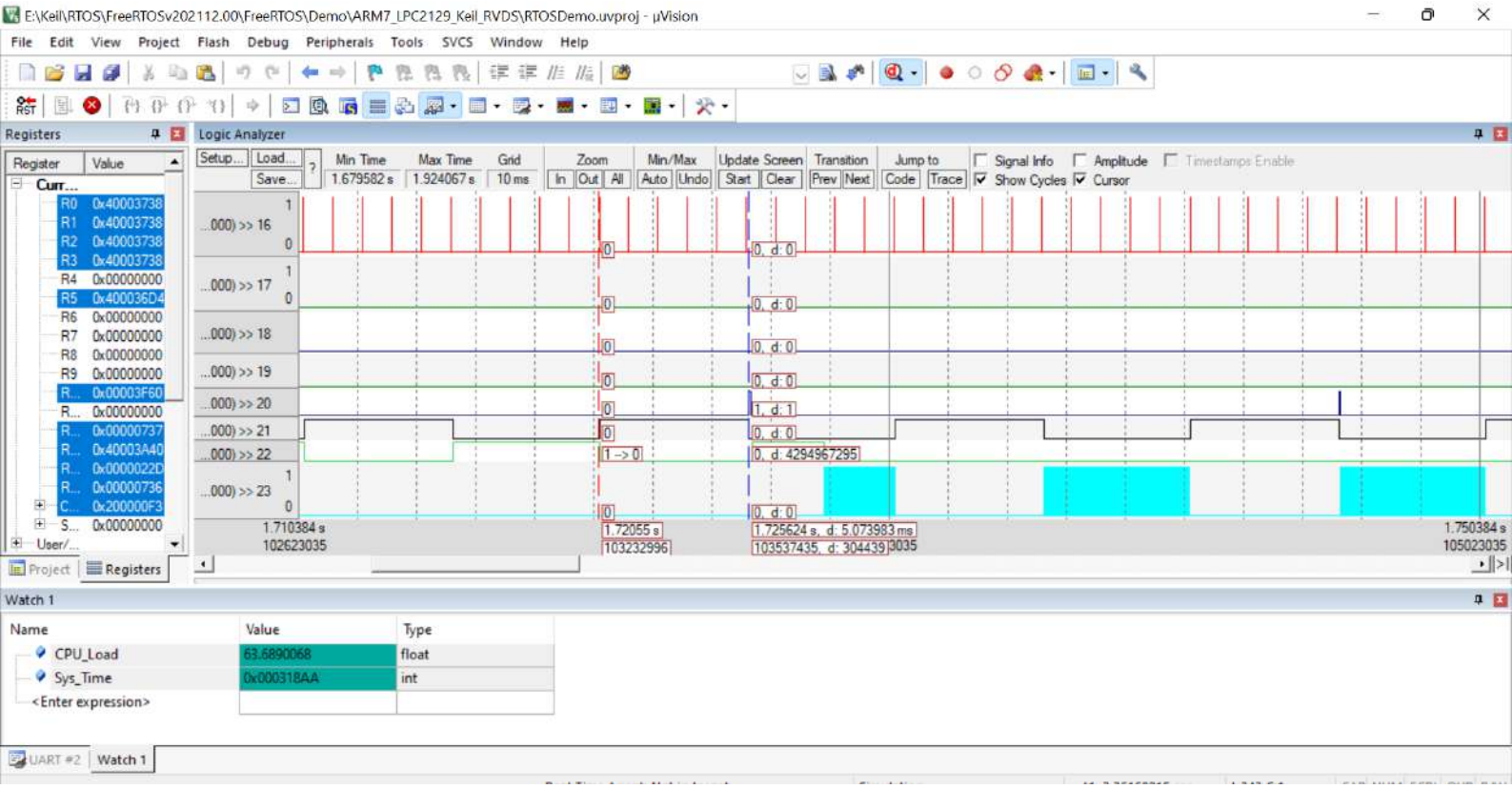

SimSo: Real-Time Scheduling Simulator - [Gantt chart]
File View Help
Gantt Results
* Simulation.xml
Zoom + Zoom - Configure
CPU 1
TASK T1
TASK T2
TASK T3
TASK T4
TASK T5
TASK T6
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

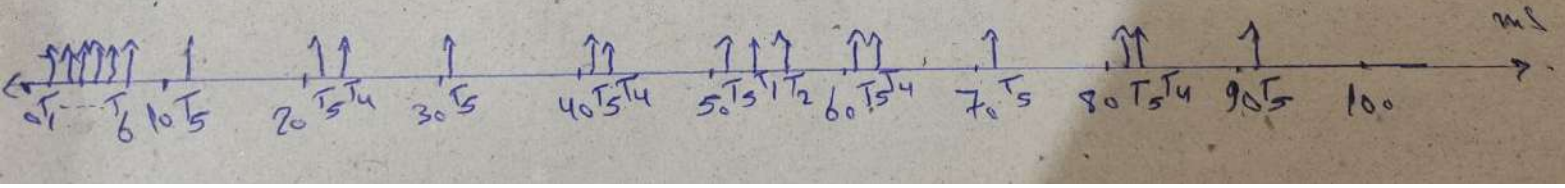

* Simulation.xml
Model data
Results
General
Logs
Tasks
Scheduler
Observation Window:
from 0.00 to 100.00 ms
Configure...
Total load
Payload
System loa
CPU 1
0.6316
0.6316
0.0000
Average
0.6316
0.6316
0.0000
Minimize


SimSo: Real-Time Scheduling Simulator
File View Help
Gantt Results
Unsaved Unsaved Simulation.xml
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) Followed by priority
1 TASK T1 Periodic Yes 0.0 50.0 - 50.0 0.04 1
2 TASK T2 Periodic Yes 0.0 50.0 - 50.0 0.04 1
3 TASK T3 Periodic Yes 0.0 100.0 - 100.0 0.1 1
4 TASK T4 Periodic Yes 0.0 20.0 - 20.0 0.18 1
5 TASK T5 Periodic Yes 0.0 10.0 - 10.0 5.0 1
6 TASK T6 Periodic Yes 0.0 100.0 - 100.0 12.0 1
Edit data fields...
Remove selected task(s)
Add task
Generate Task Set


E:\Keil\RTOS\FreeRTOSv202112.00\FreeRTOS\Demo\ARM7_LPC2129_Keil_RVDS\RTOSDemo.uvproj - µVision
File Edit View Project Flash Debug Peripherals Tools SVCS Window Help
Registers
Register Value
Curr...
R0 0x40003738
R1 0x40003738
R2 0x40003738
R3 0x40003738
R4 0x00000000
R5 0x400036D4
R6 0x00000000
R7 0x00000000
R8 0x00000000
R9 0x00000000
R... 0x00003F60
R... 0x00000000
R... 0x00000737
R... 0x40003A40
R... 0x0000022D
R... 0x00000736
C... 0x200000F3
S... 0x00000000
User/...
Project Registers
Logic Analyzer
Setup... Load... Save...
Min Time 1.679582 s
Max Time 1.924067 s
Grid 10 ms
Zoom In Out All
Min/Max Auto Undo
Update Screen Start Clear
Transition Prev Next
Jump to Code Trace
Signal Info
Amplitude
Timestamps Enable
Show Cycles
Cursor
...000) >> 16
...000) >> 17
...000) >> 18
...000) >> 19
...000) >> 20
...000) >> 21
...000) >> 22
...000) >> 23
0, d: 0
1, d: 1
1 --> 0
0, d: 4294967295
1.710384 s
102623035
1.72055 s
103232996
1.725624 s, d: 5.073983 ms
103537435, d: 304439
1.750384 s
105023035
Watch 1
Name Value Type
CPU_Load 63.6890068 float
Sys_Time 0x000318AA int
<Enter expression>
UART #2 Watch 1

| Tasks | Periodicity | Deadline | Execution time | no. of occurrence in HyperPeriod |
|---|---|---|---|---|
| Button 1 | 50 ms | 50 ms | 2 | 40 Ms |
| Button 2 | 50 ms | 50 ms | 2 | 40 Ms |
| Periodic Transmitter | 100 ms | 100 ms | 1 | 100 Ms |
| Recver | 20 ms | 20 ms | 5 | 180 Ms |
| load 1 | 10 ms | 10 ms | 10 | 5 Ms |
| load 2 | 100 ms | 100 ms | 1 | 12.5 ms |

* HyPerPeriod is = 100 ms
* The execution time was calculated from Keil Simulation using vTaskSetApplicationTaskTag and GPIOS



3) CPU load :- = total execution time / hyper. period

= 2(40 ms) + 2(40 ms) + 5(180 ms) + 1(100 ms) + 10(5 ms) + 1(12.5 ms) / (1100 ms) = 63.16% #

4) System schedulability :-

$U < n(2^{(1/n)} - 1)$

0.63 < 0.73 #

| Task | Analysis | schedulable ? |
|---|---|---|
| Button1 | $= 30M + (50/20)\,40M + (50/10)\,5m = 25.31\ m.s < 50$ | yes |
| Button2 | $30M + (50/50)\,30M + (50/20)\,40M + (50/10)\,5m = 25.34\ m.s < 50$ | yes |
| Periodic | $(100/50)\,30M + (100/50)\,30M + (100/20)\,140M + (100/10)\,5m + 94M = 50.914\ m.s < 100$ | yes |
| UART | $(100/50)\,30M + (100/50)\,30M + (100/20)\,140M + (100/10)\,5m + 94M = 50.914\ m.s < 100$ | yes |
| load1 | $5m + 0 = 5\ m.s < 10$ | yes |
| load2 | $(100/50)\,30M + (100/50)\,30M + (100/20)\,140M + (100/10)\,5m + 94M + 12.5m = 63.414\ m.s < 100$ | yes |