



Name: Ziad Ayman

E-mail: ziad_ayman1999@icloud.com

Project: EDF Scheduler

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Analytical Solution:

Tasks	Periodicity	Deadline	Hyper-Period	Time
B1	50ms	50ms	2	6.15us
B2	50ms	50ms	2	6.15us
Periodic	100ms	100ms	1	0.13ms
UART	20ms	20ms	5	8.1us
L1	10ms	10ms	10	5ms
L2	100ms	100ms	1	12ms

HyperPeriod:

It is the time in which all the tasks come together = 100ms

CPU Load:

$$U = R/C$$

$$U = (E1+E2+E3+E4+E5+E60)/H$$

$$U = ((6.15\mu s * 2) + (6.15\mu s * 2) + (0.13ms) + (8.1\mu s * 5) + (5ms * 10) + (12ms)) / 100ms$$

$$U = 62.2\%$$

Schedulability:

- Rate Monotonic:

$$U = (6.15\mu s/50ms) + (6.15\mu s/50ms) + (0.13ms/100ms) + (8.1\mu s/20ms) + (5ms/10ms) + (12ms/100ms)$$

$$U = 0.622$$

$$U_{rm} = 6 * (2^{(1/6)} - 1) = 0.735$$

$$U < U_{rm}$$

System is schedulable.

- Time demand: Worst case = 100ms

Tasks	Equations	Schedulable
L1	$W1(10) = 5 + 0 = 5 < 10$	YES
UART	$W2(20) = 8.1\mu s + (20/10)*5 = 10 < 20$	YES
B1	$W3(50) = 6.15\mu s + (50/20)*8.1\mu s + (50/10)*5 = 25 < 50$	YES
B2	$W4(50) = 6.15\mu s + (50/50)*6.15\mu s + (50/20)*8.1\mu s + (50/10)*5 = 25 < 50$	YES
Periodic	$W5(100) = 0.13 + (100/50)*6.15\mu s + (100/50)*6.15\mu s + (100/20)*8.1\mu s + (100/10)*5 = 50 < 100$	YES
L2	$W6(100) = 12 + (100/100)*0.13 + (100/50)*6.15\mu s + (100/50)*6.15\mu s + (100/20)*8.1\mu s + (100/10)*5 = 62 < 100$	YES

SimSo:

SimSo: Real-Time Scheduling Simulator - [Model data]

File View Help

Unsaved

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	<input checked="" type="checkbox"/> Yes	0	50.0	-	50.0	0.00615	▼ 0	
2	TASK T2	Periodic	<input checked="" type="checkbox"/> Yes	0	50.0	-	50.0	0.00615	▼ 0	
3	TASK T3	Periodic	<input checked="" type="checkbox"/> Yes	0	100.0	-	100.0	0.13	▼ 0	
4	TASK T4	Periodic	<input checked="" type="checkbox"/> Yes	0	20.0	-	20.0	0.0081	▼ 0	
5	TASK T5	Periodic	<input checked="" type="checkbox"/> Yes	0	10	-	10	5.0	▼ 0	
6	TASK T6	Periodic	<input checked="" type="checkbox"/> Yes	0	100.0	-	100.0	12.0	▼ 0	

Edit data fields...

Remove selected task(s) Add task Generate Task Set

Figure 1

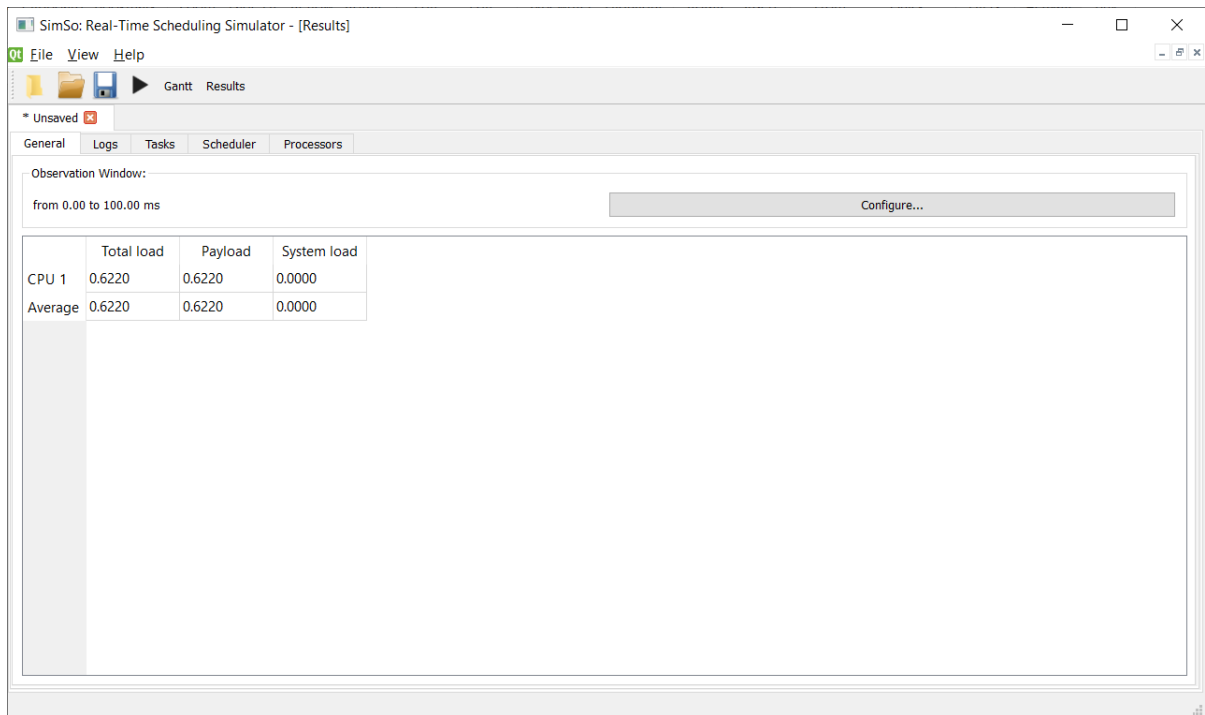


Figure 2

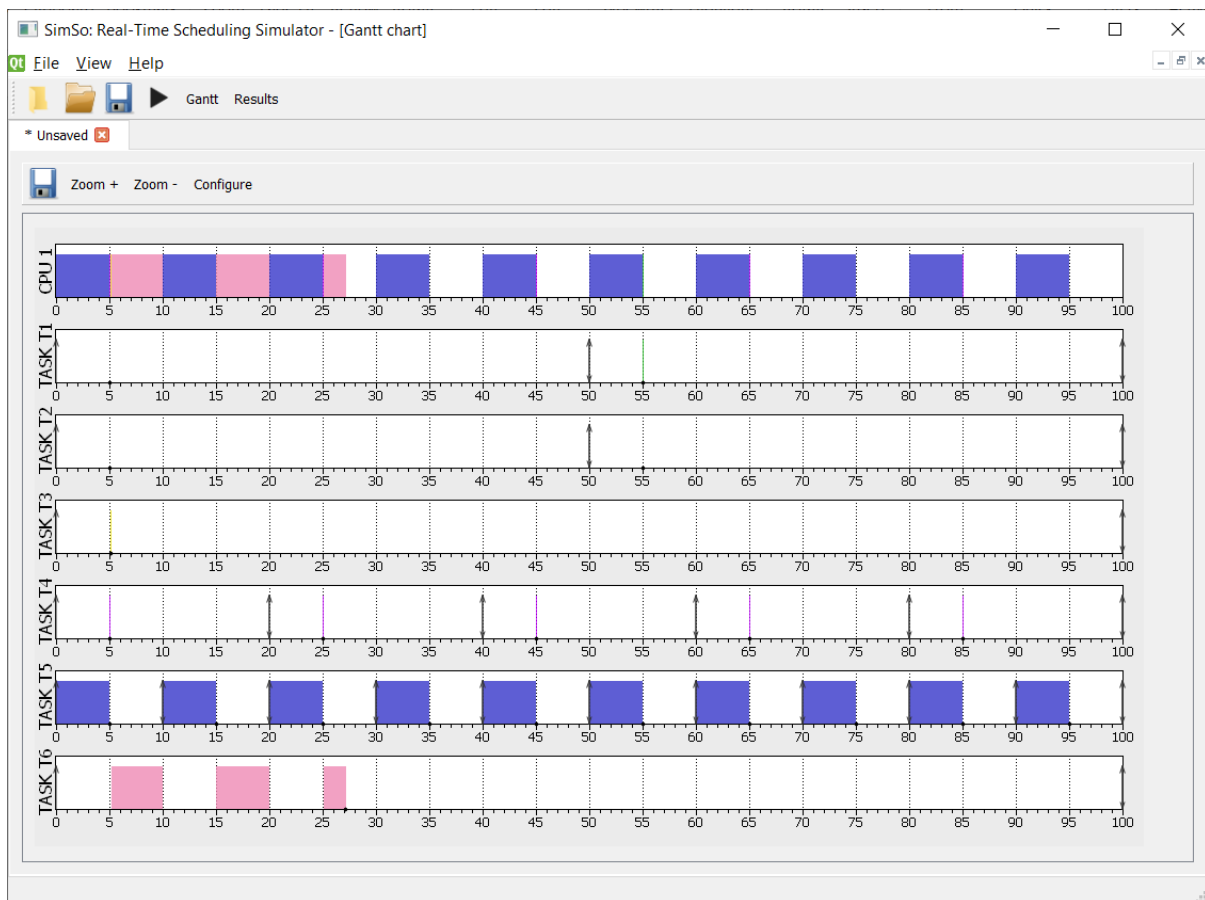


Figure 3

Keil (Logic Analyzer):

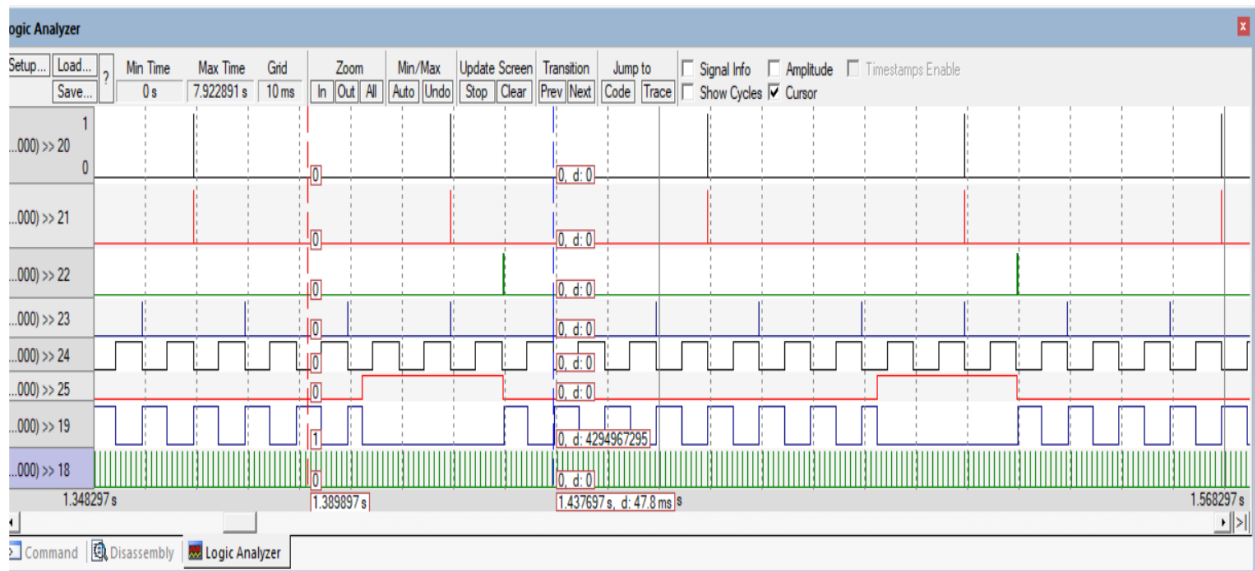


Figure 4