

EDF SCHEDULER

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Hyperperiod

Task	Periodicity
Button 1 Monitor	50
Button 2 Monitor	50
Periodic Transmitter	100
UART Transmitter	20
Load 1 Simulation	10
Load 2 Simulation	100

Hyperperiod = 100ms

CPU Load

Using SIMSO

The screenshot displays the SIMSO software interface. The main window, titled 'Model data', has a 'Tasks' tab selected. It contains a table with the following data:

id	Name	Task type	Abort on miss	Act. Date (ms)	Period (ms)	List of Act. dates (ms)	Deadline (ms)	WCET (ms)	Followed by
1	TASK T1	Periodic	<input type="checkbox"/> No	0	50	-	50	0.0134	1
2	TASK T2	Periodic	<input type="checkbox"/> No	0	50	-	50	0.0136	1
3	TASK T3	Periodic	<input type="checkbox"/> No	0	100	-	100	0.01295	1
4	TASK T4	Periodic	<input type="checkbox"/> No	0	20	-	20	0.01367	1
5	TASK T5	Periodic	<input type="checkbox"/> No	0	10	-	10	5.019	1
6	TASK T6	Periodic	<input type="checkbox"/> No	0	100	-	100	12.04	1

Below the main window, a 'Results' dialog box is open, showing the 'General' tab. It displays the 'Observation Window' from 0.00 to 100.00 ms. A table shows the following results:

	Total load	Payload	System load
CPU 1	0.6237	0.6237	0.0000
Average	0.6237	0.6237	0.0000

Using Utilization Calculation

$U = \text{Time Executing} / \text{Period}$

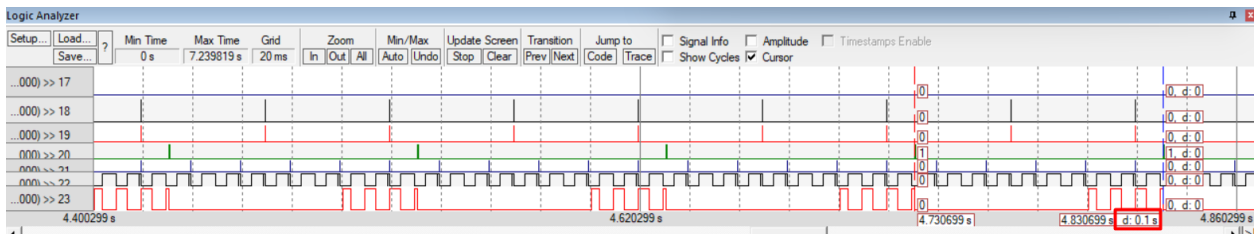
$$U = (0.0134/50) + (0.0136/50) + (0.01295/100) + (0.01367/20) + (5.019/10) + (12.04/100) = \mathbf{62.37\%}$$

Keil Simulator

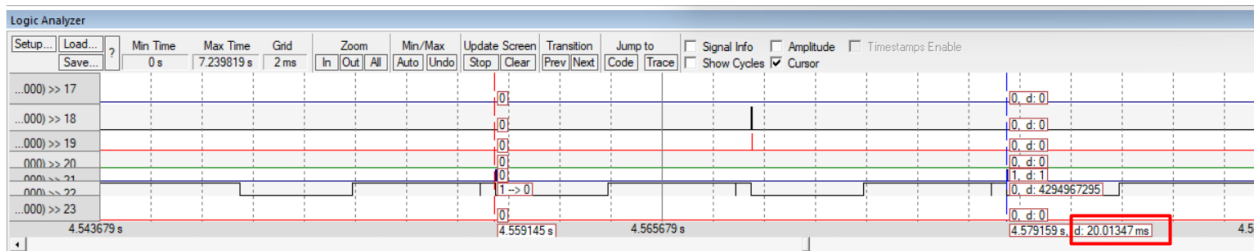
Task 1 and 2:



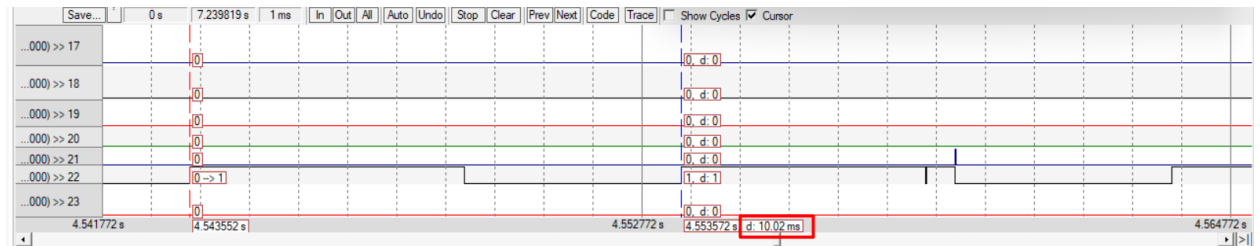
Task 3:



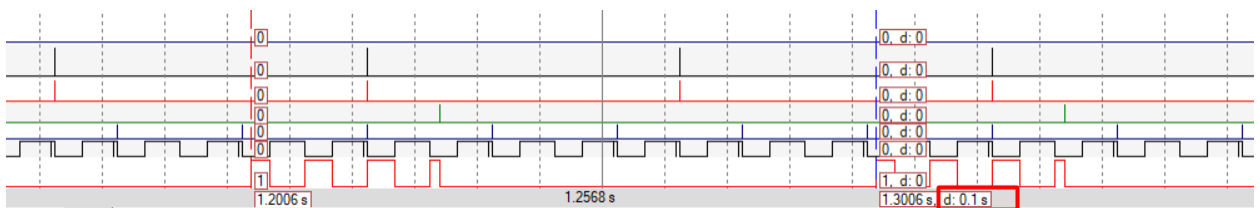
Task 4:



Task 5:



Task 6:



System Schedulability

Using URM

Number of tasks = 6

$$U = 0.6237$$

$$URM = 3 * (2^{1/3} - 1) = 0.7798$$

Since $U < URM$, then system is **Schedulable**.

Using Time Demand Analysis

$$w_i(t) = e_i + \sum_{k=1}^{i-1} \left\lceil \frac{t}{p_k} \right\rceil e_k \quad \text{for } 0 < t \leq p_i$$

W = Worst response time

E = Execution time

P = Periodicity

T = Time instance

Task 5

E= 5ms

P= 10ms

t=10ms

$$w_5(10) = 5 < 10$$

Schedulable

Task 4

E= 100us

P= 20ms

t=20ms

$$w_4(20) = 10.03 < 20$$

Schedulable

Task 1

E= 25us

P= 50ms

t=50ms

$$w_1(50) = 25.059 < 50$$

Schedulable

Task 2

E= 25us

P= 50ms

t=50ms

$$w_2(50) = 25.087 < 50$$

Schedulable

Task 3

$E = 90 \text{ us}$

$P = 100\text{ms}$

$t = 100\text{ms}$

$w_3(100) = 50.359 < 100$

Schedulable

Task 6

$E = 12\text{ms}$

$P = 100\text{ms}$

$t = 100\text{ms}$

$w_6(100) = 62.452 < 100$

Schedulable

System Is Schedulable

SIMSO Simulator

