EDF Scheduler Project

🞦 The System Hyperperiod

- Button_1 = 50 ms
- Button_2 = 50 ms
- Periodic _Transmitter = 100 ms
- Uart_Receiver = 20 ms
- Load_1 = 10 ms
- Load_2 = 100 ms

➢ **Hyperperiod = 100 ms**

🞦 The CPU Load

- **CPU load = Total Execution Time During Hyperperiod / Hyperperiod**
- **For One Hyperperiod**

- Button_1 = 2*25.47 us
- Button_2 = 2*25.47 us
- Periodic _Transmitter = 1*27.6 us
- Uart_Receiver = 5*29.6 us
- Load_1 = 10*5 ms
- Load_2 = 1* 12 ms

➢ **CPU Load = ((0.02547 * 2) + (0.02547 * 2) + (0.0276 * 1) + (0.0296 * 5) + (5 * 10) +(12 * 1)) /100 = 0.62277 =62.27748%**

🞦 System Schedulability

1. Rate-Monotonic

A system is said to be feasible (Schedulable) if :

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

- U =0.62277 =62.27748%
- $URM = n\,(2^{(1/n)} - 1) = 6(\,2^{(1/6)} - 1\,) = \mathbf{0.7347} = 73.47\%$
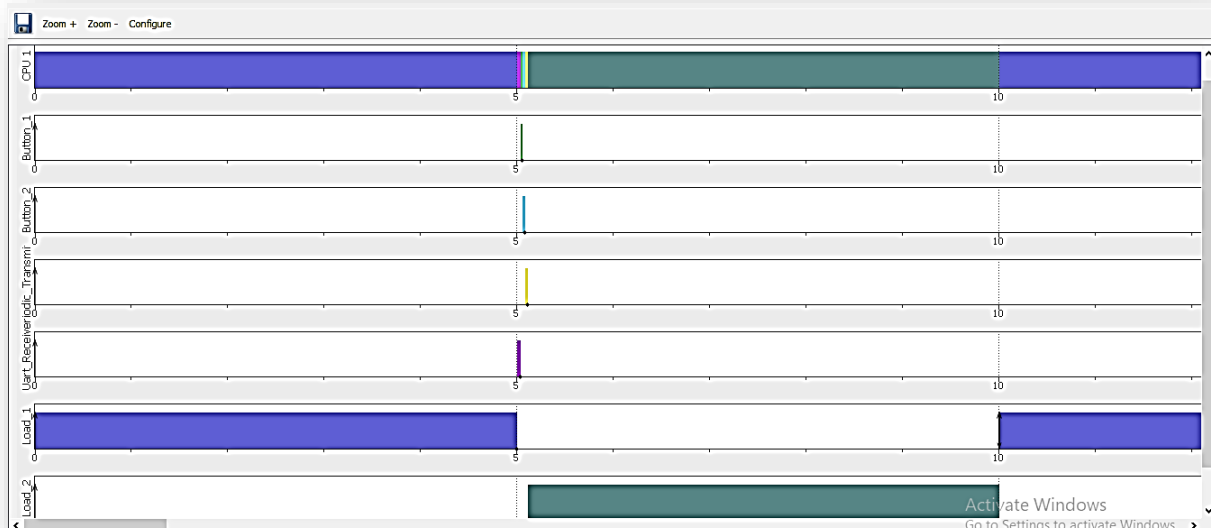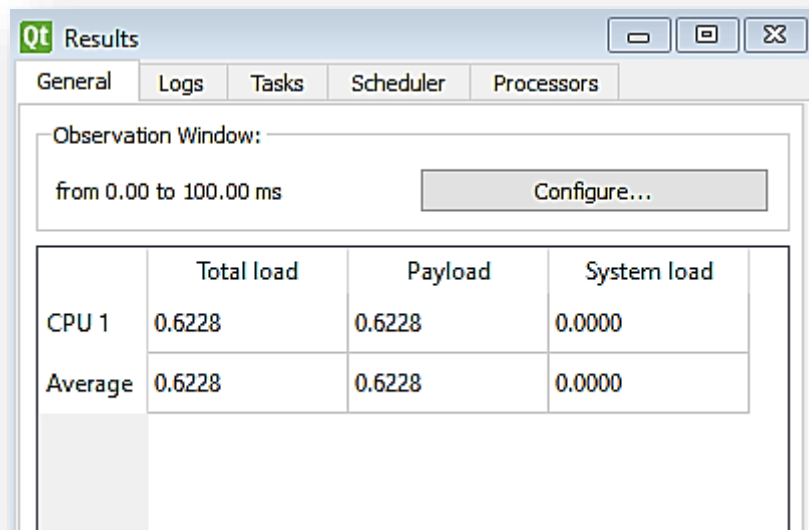- $Therefore,\ \ U < URM$

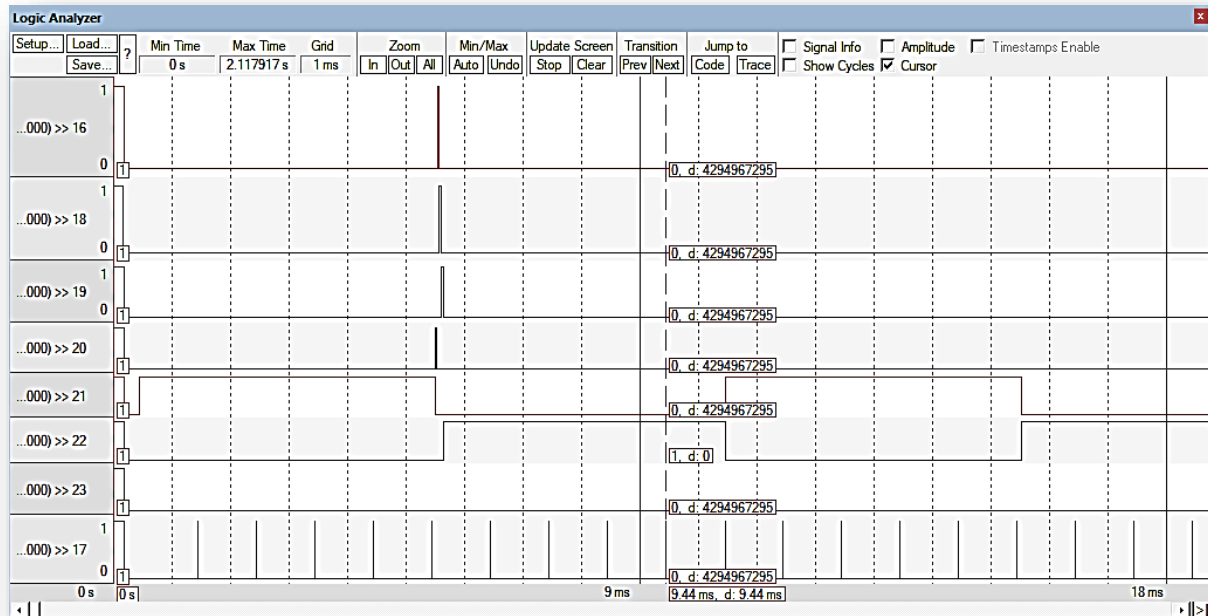➢ **Therefore, The system is feasible (Schedulable).**

2. Time Demand Analysis

$$W(t) = \sum_{k=1}^{i-1} \left(\frac{t}{p}\right) e$$

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- Load1: $W(10) = 5 = 5$, W(10) is less than deadline for load1.
- Load1 is schedulable.

- Uart_Receiver : W(20) = 0.0296 + (20/10) * 5 = 10.0296, W(20) is less than deadline for UART (20).
- Uart_Receiver is schedulable.

- Button_1: W(50) = 0.02547 + (50/20) *0.0296 + (50/10) * 5 = 25.09947, W(50) is less than deadline for Button (50).
- Button_1 is schedulable.

- Button_2:W(50) = 0.02547 + (50/20) *0.0296 + (50/10) * 5 + (50/50) * 0.02547 = 25.12494, W(50) is less than deadline for Button (50).
- Button_2 is schedulable.

- Periodic_Transmitter: W(100) = 0.0276 + (100/20) *0.0296 + (100/10) *5 +(100/50) * 0.02547 + (100/50) * 0.02547 = 50.27748, W(100) is less than deadline for Periodic (100).
- Periodic_Transmitter is schedulable.

- Load2: W(100) = 12 + (100/20) * 0.0296 + (100/10) * 5 + (100/50) * 0.02547 + (100/50) * 0.02547 + (100/100) * 0.0276 = 62.27748, W(100) is less than deadline for Load2 (100).

- Load2 is schedulable.

♣ Simso Offline Simulator

Qt Results

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Observation Window:

from 0.00 to 100.00 ms   Configure...

	Total load	Payload	System load
CPU 1	0.6228	0.6228	0.0000
Average	0.6228	0.6228	0.0000

Zoom +   Zoom -   Configure

CPU 1
Button_1
Button_2
Periodic_Transmi
Uart_ReceiverI
Load_1
Load_2

Keil Simulator