egyptfwd initiative

Implementing EDF Scheduler

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Documentation target	**Verifying the system implementation**

1. Using analytical methods for system calculation:

- The system hyperperiod

  Hyperperiod equals the least common multiplier (LCM) of all the tasks periodicities = 100ms

Task name	Periodicity	Deadline	Execution time (ms)	Occurrence during hyperperiod
Button1	50	50	0.02	2
Button2	50	50	0.02	2
Periodic_Transmitter	100	100	0.08	1
UART_Receiver	20	20	0.04	5
Load1_Simulation	10	10	5	10
Load2_Simulation	100	100	12	1

- CPU Load

  CPU Load = (0.02*2 + 0.02*2 + 0.08*1 + 0.04*5 + 5*10 + 12*1) *100 = 62.36%

- System schedulability using URM

  Using equation:

  $$U \leq n\ [\ 2\ \hat{}\ (1\ /\ n) - 1]$$

  Left side of equation = 0.6236

  Right side of equation = 0.73477

  Then, System is Schedulable

Using time demand analysis techniques:

- For Load1_Simulation
  W1 = 5ms
  W1 < 10
  Task is Scheduable

- For UART_Receiver
  W2 = 0.04 + (20/10) * 5 = 10.04ms
  W2 < 20
  Task is Scheduable

- For Button1
  W3 = 0.02 + (50/20) * 0.04 + (50/10) * 5 = 25.12ms
  W3 < 50
  Task is Scheduable

- For Button2
  W4 = 0.02 + (50/50) * 0.02 + (50/20) * 0.04 + (50/10) * 5 = 25.14ms
  W4 < 50
  Task is Scheduable

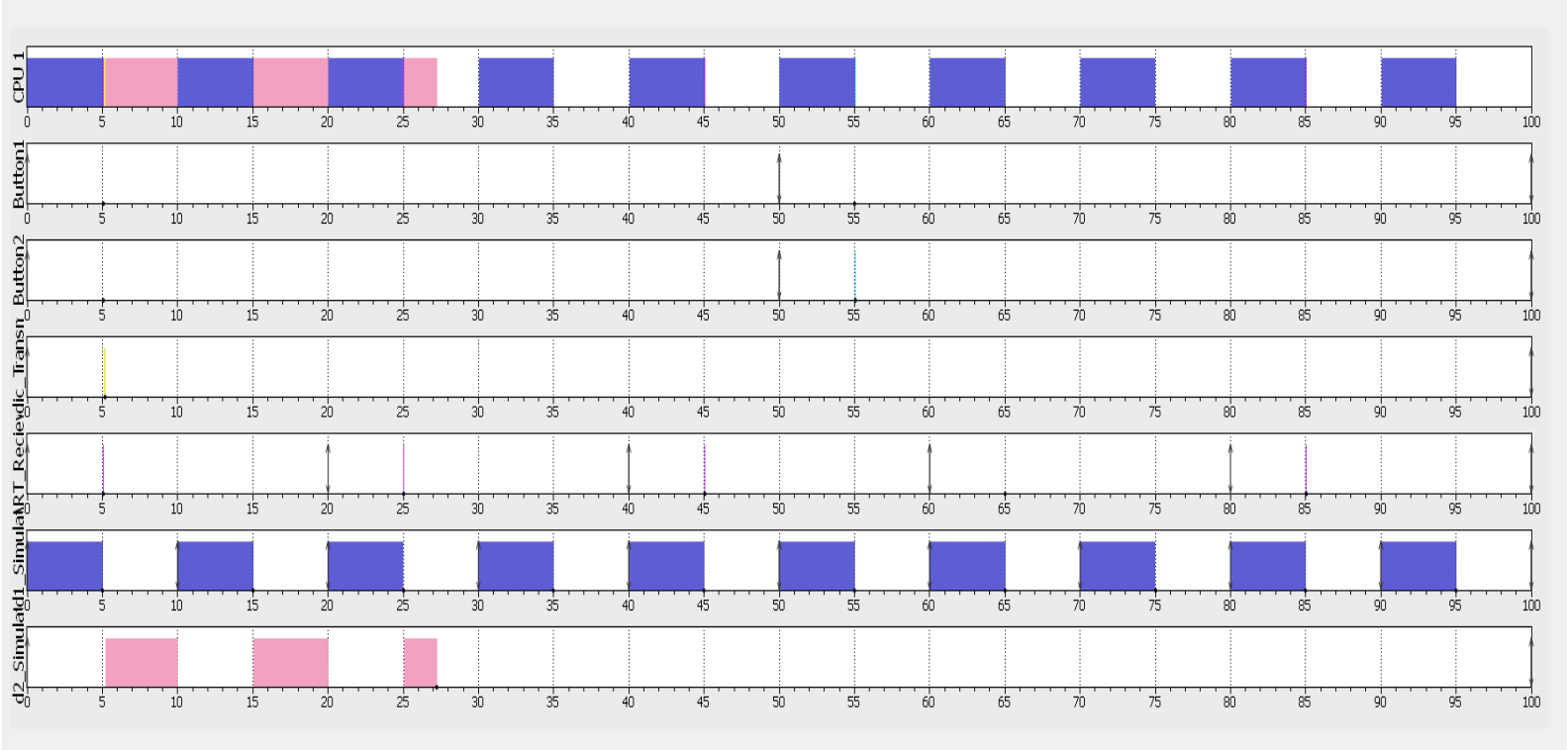
- Periodic_Transmitter
  W5 = 0.08 + (100/50) * 0.02 + (100/50) * 0.02 + (100/20) * 0.04 + (100/10) * 5 = 50.36ms
  W5 < 100
  Task is Scheduable

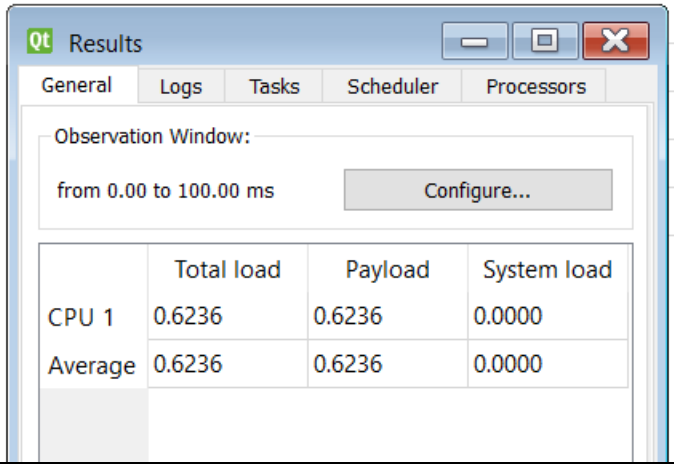
- For Load2_Simulation
  W6 = 12 + (100/100) * 0.08 + (100/50) * 0.02 + (100/50) * 0.02 + (100/20) * 0.04 + (100/10) * 5 = 62.36ms
  W6 < 100
  Task is Scheduable

As all tasks are Scheduable,

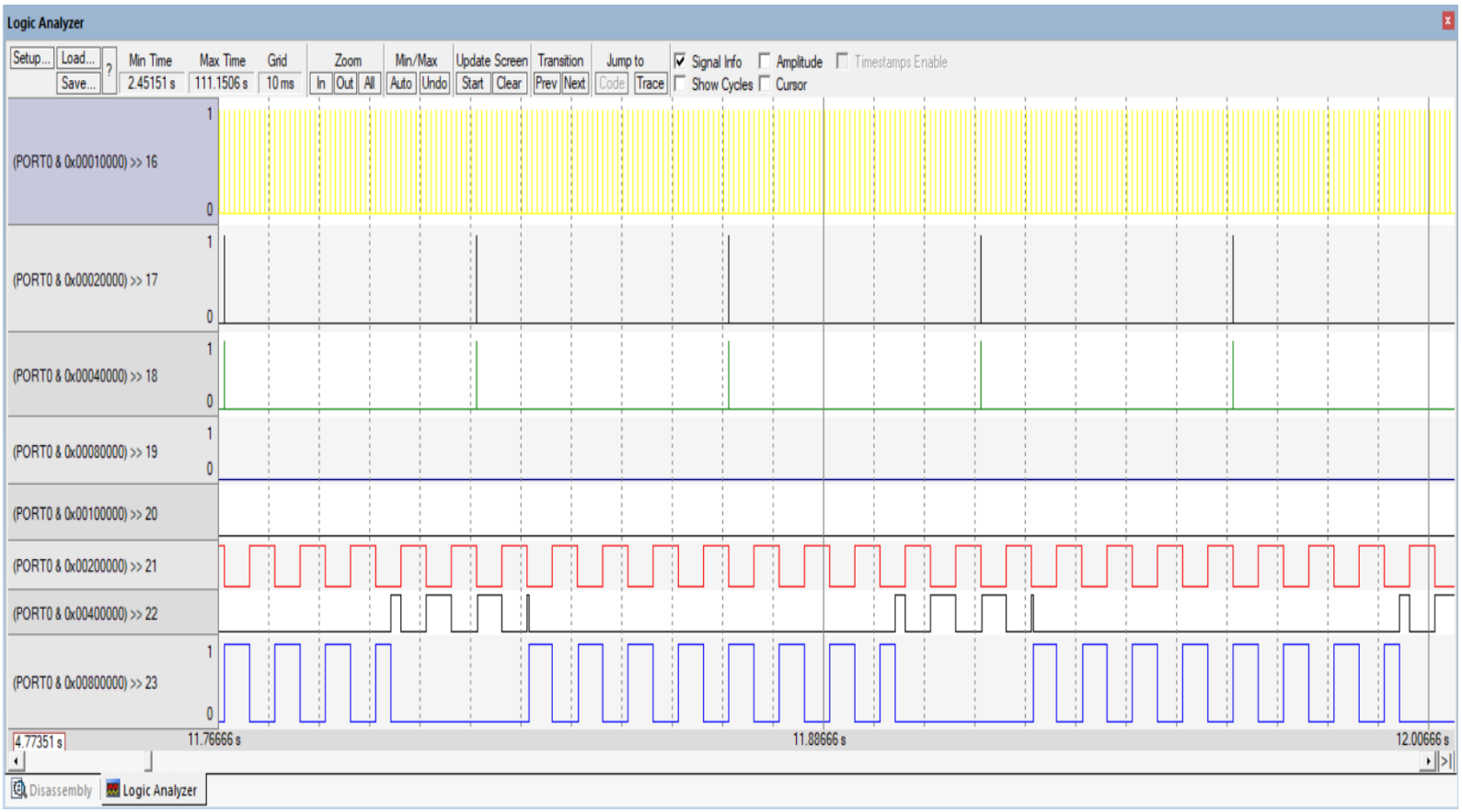
Then, System is Scheduable

2. Simso offline simulator





3. Keil simulator



Watch 1

Name	Value	Type
Total_execution_time	8672532	uint
T1TC	13823807	ulong
CPU_Load	62	uint
<Enter expression>		