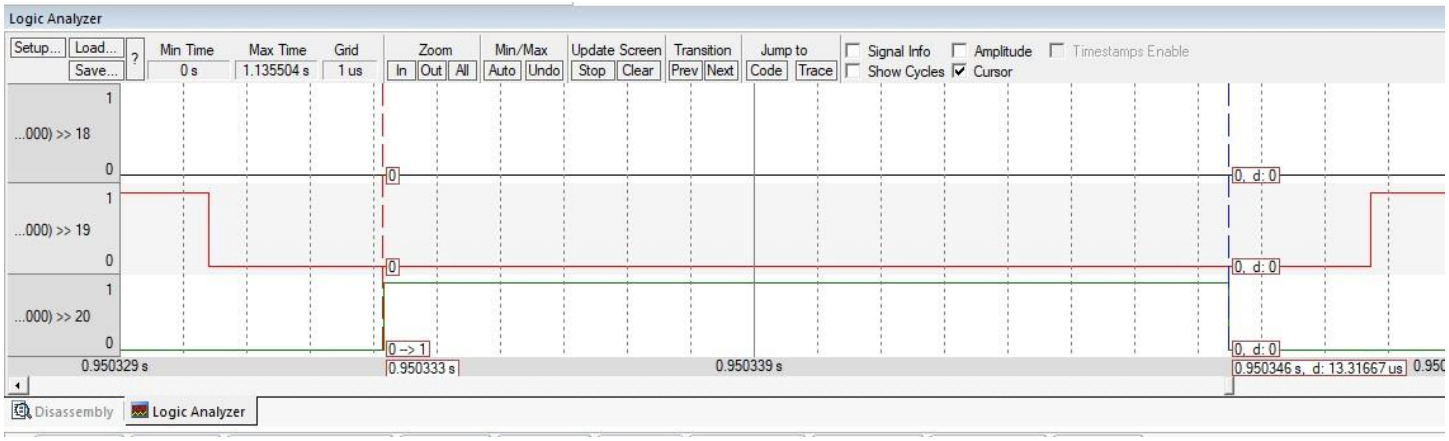
Bassant Ahmed Mohamed
EDF Project Report

Submitted to:

EgFwd Advanced Embedded System Track

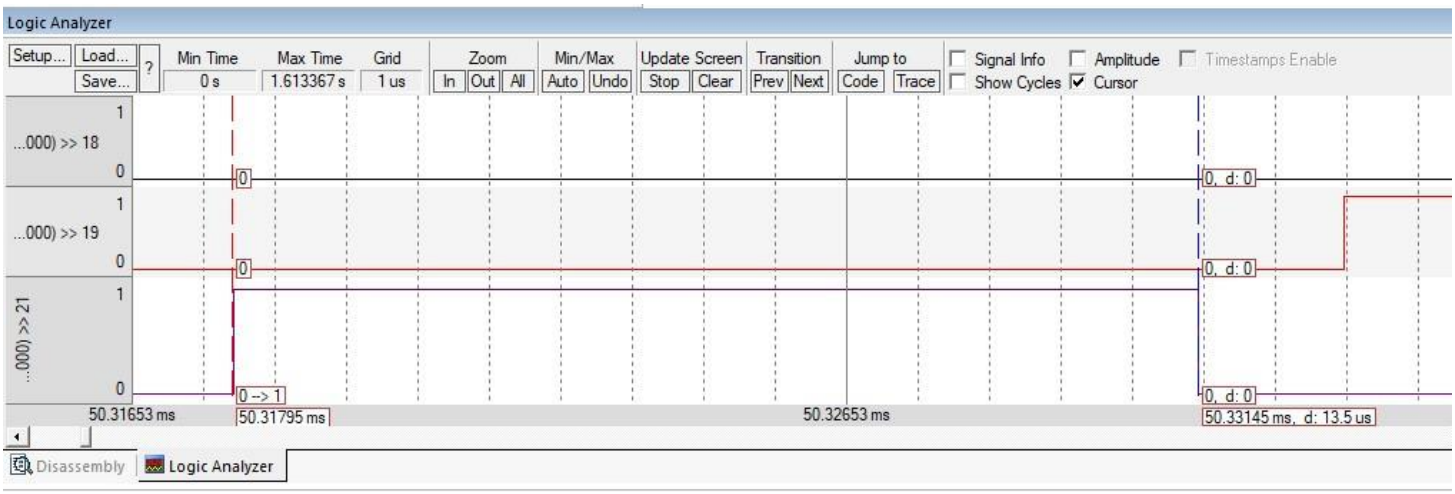
1.Tasks Periods

1.1 Button_1_Monitor Task



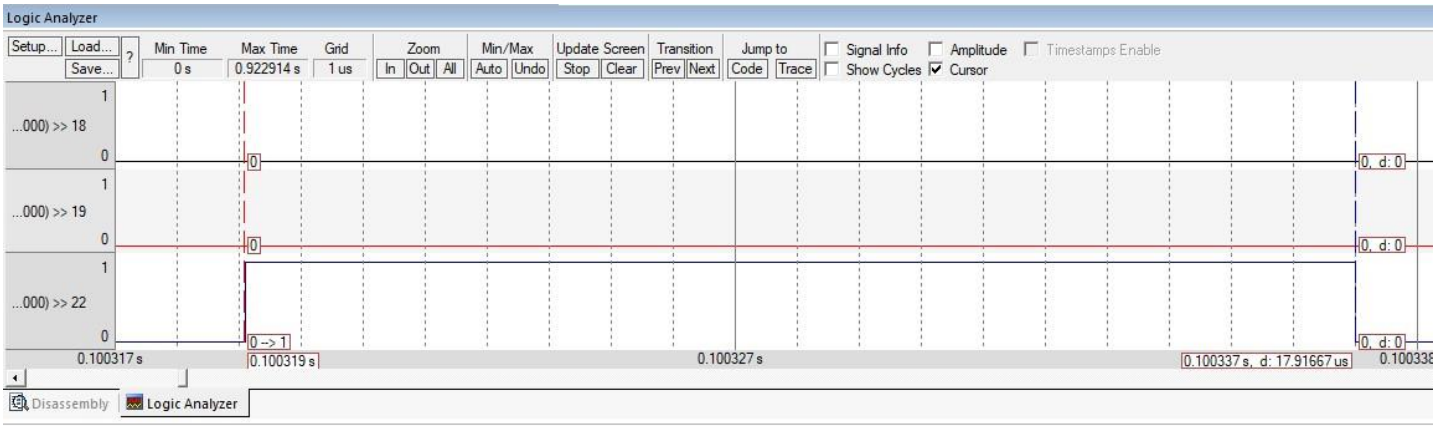
Period of Button_1_Monitor (Pin 20 in green) = 13.317 us

1.2 Button_2_Monitor Task



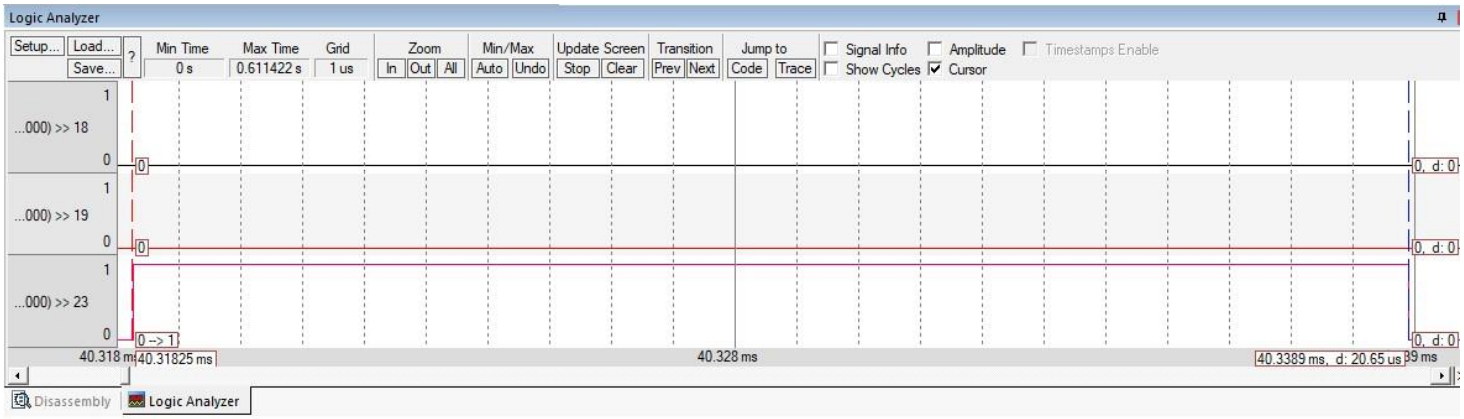
Period of Button_2_Monitor (Pin 21 in Purple) = 13.5 us

1.3 Periodic_Tramsmitter



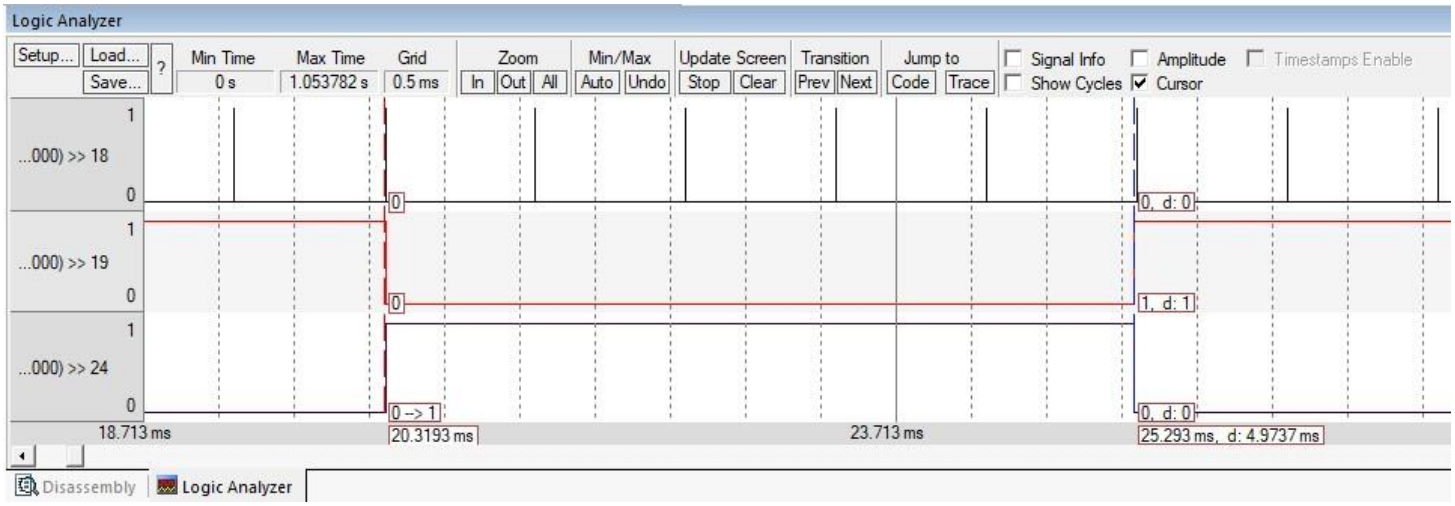
Period of Periodic_Transmitter (Pin 22 in Blue) = 17.92 us

1.4 UART_Reciever



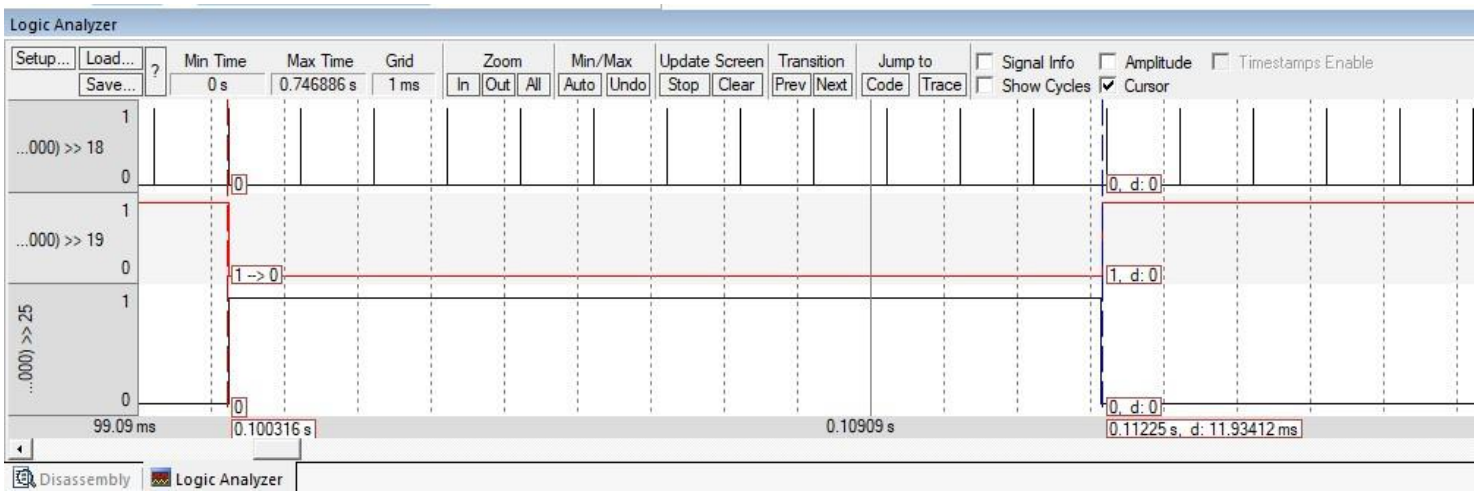
Period of UART_Reciever (Pin 23 in Pink) = <u>20.65 us</u>

1.5 Load_1_Simulation



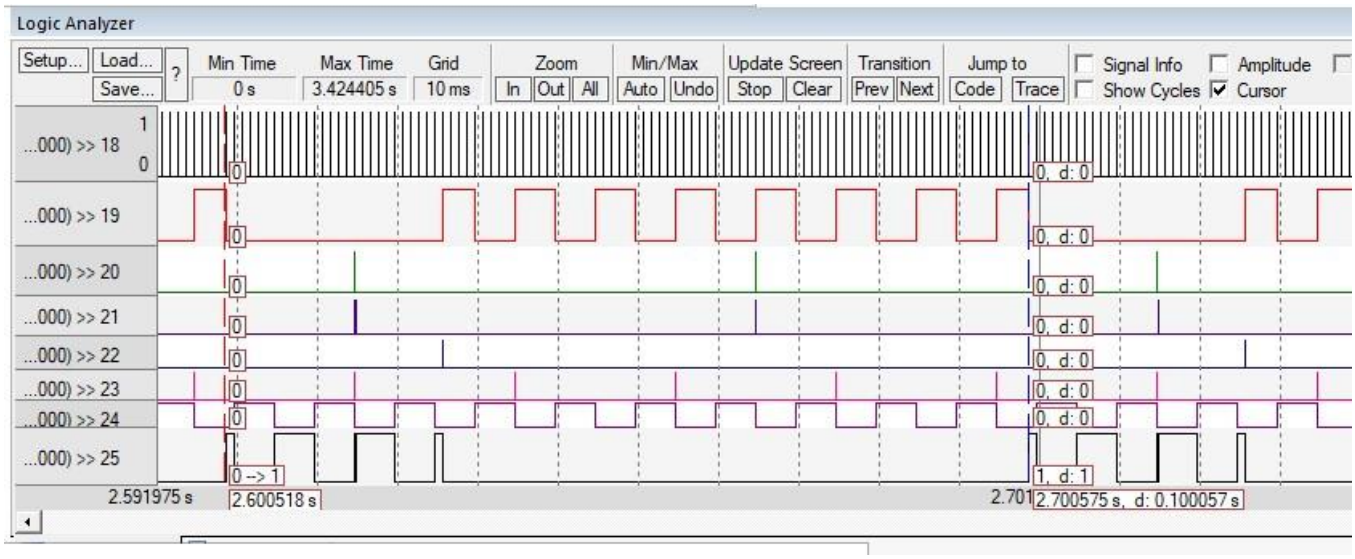
Period of Load_1_Simulation (Pin 24 in purple) = <u>4.97 ms</u>

1.6 Load_2_Simulation



Period of Load_2_Simulation (Pin 25 in Black) = <u>11.93 ms</u>

2. Calculating The System Hyperperiod



Hyperperiod = LCM (Pi) = 100 ms

Where Pi is all tasks periodicity.

3. Calculating The CPU Load (U)

$U = \frac{R}{C}$ OR $\frac{Total\ tasks'exeqution\ time}{hyperperiod}$

$Total\ tasks\ exeqution\ time = (2 * 13.317\ us) + (2 * 13.5us) + 17.92us + (5 * 20.65us) + (10 * 4.9ms) + 11.93ms = 61.1ms$

$U = \frac{61.1ms}{100ms} * 100 = 61.1\%$

4. Checking System Shedulability

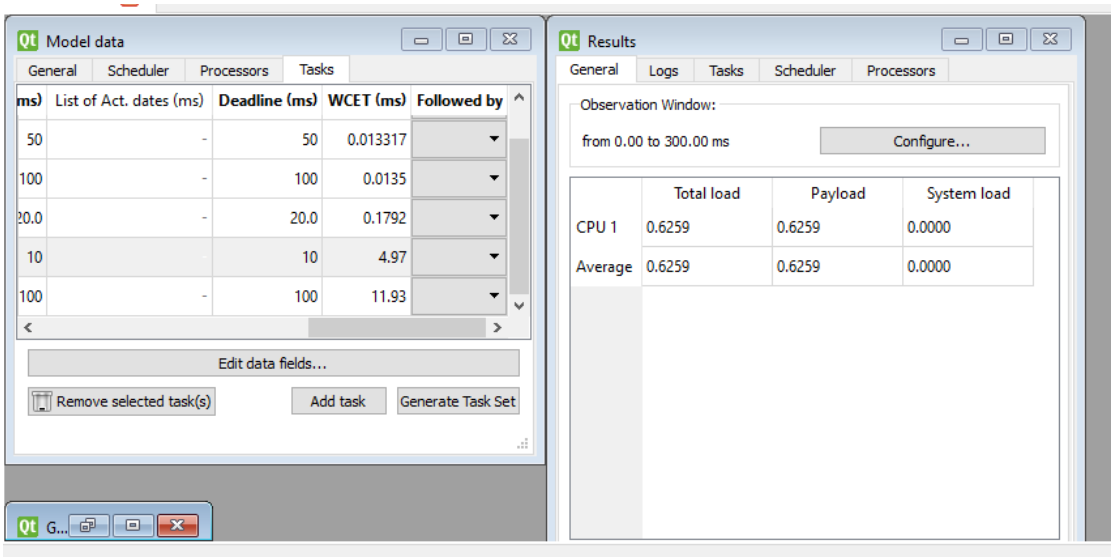
$URM = n\left(2^{\frac{1}{n}} - 1\right)$

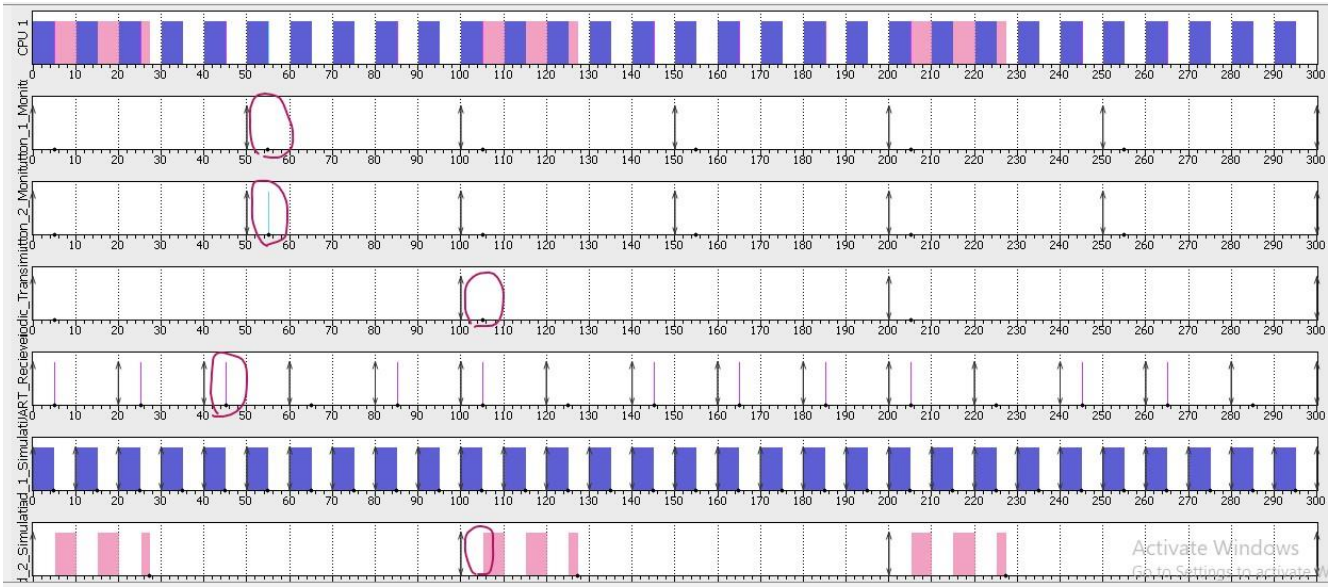
Where n is the number of tasks.

$URM = 6\left(2^{\frac{1}{6}} - 1\right) = 0.735$

U < URM → then system is schedulable .

5. Using Offline Simulator (SimSo)





6. Notes

- Simulating on SimSo didn't run as expected in Periodic_Transmitter task, as in Keil the task start execution at the end of the other 5 tasks execution and before going again to the idle task.
- The system successfully ran as the implementation of the EDF schedular.