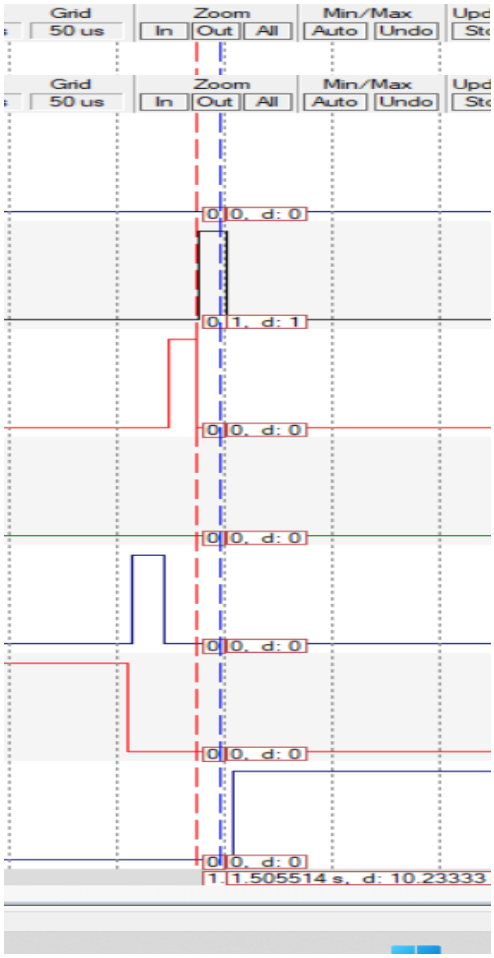
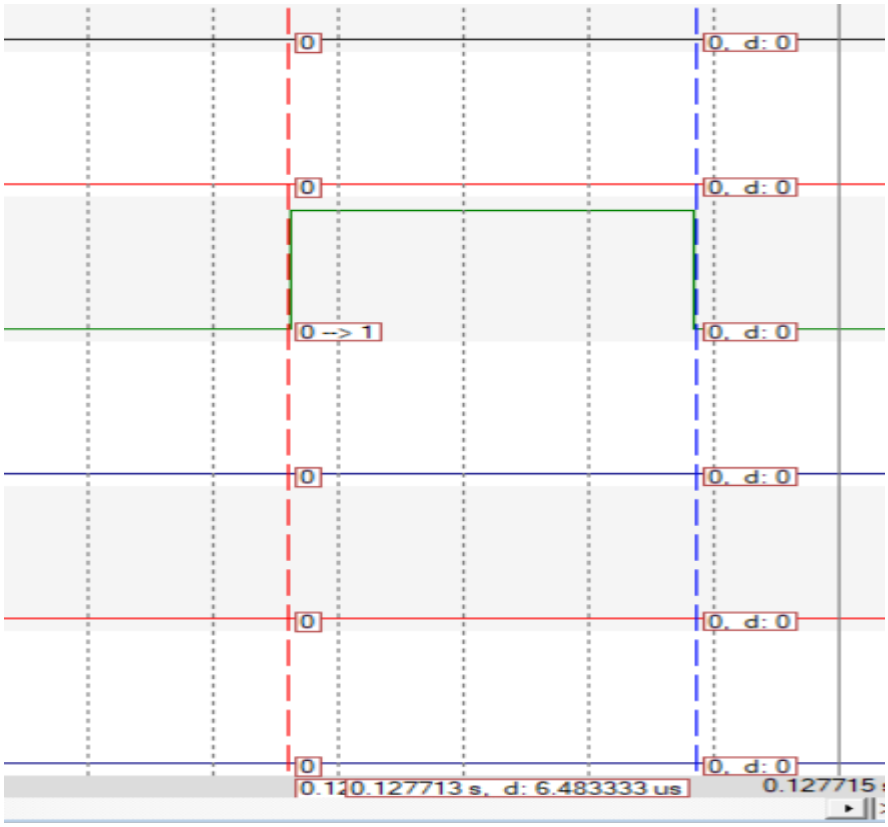
EDF SCHEDULER

we Should first Calculate the Execution Time Of each Task :



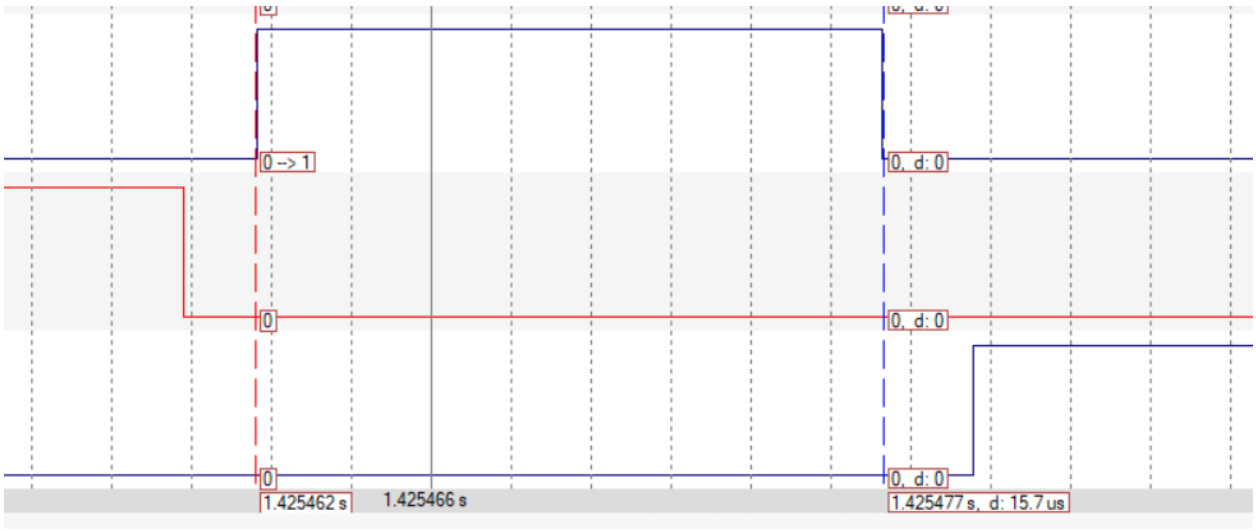
BUTTON_1_MONITOR ------> About 10 us.

BUTTON_2_MONITOR ------> About 10 us.



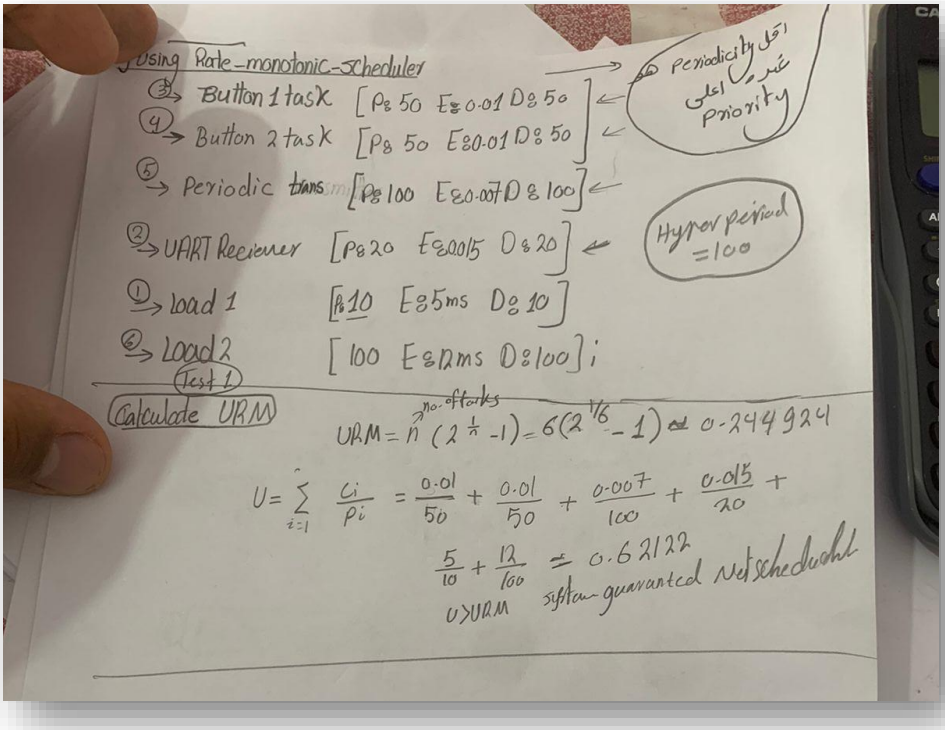
PERIODIC TRANSMITTER ----->
About 6 to 7 us

Uart_Receiver ---> About 15 us



Task 5: ""Load_1_Simulation"", {Periodicity: 10, Deadline: 10}, Execution time: 5ms
Task 6: ""Load_2_Simulation"", {Periodicity: 100, Deadline: 100}, Execution time: 12ms

Using Analytical Method :



Test 2

Time Demand Analysis → $w_i(t) = e_i + \sum_{x=1}^{i-1} \left[\frac{t}{P_x}\right] e_x$

→ From higher priority to lower priority

① Time Demad [Load 1]

→ $w_1(10) = 5 + 0 = 5$ → Tas2 is scheduled

② Time Demand [UARTRecievar]

$w_2(20) = 0.015 + \left[\frac{20}{10}(5)\right] = 10.015$ ⇒ Tas2 is scheduled

③ Time Demand [Button-1-Tash] ⇒

$w_3(50) = 0.01 + \left[\frac{50}{10} * 5\right] + \left[\frac{50}{20} * 0.015\right]$

$= 25.0475$ → Task is scheduleed

④ Time Demand [Button-2-Tas2] as same delay

$w_4(50) = 0.01 + \left[\frac{50}{10} * 5\right] + \left[\frac{50}{20} * 0.015\right] + \left[\frac{50}{50} * 0.01\right]$

$= 25.0575$ → Tash is scheduled

⑤ Tim Demand [Periodic Transmittar] ⇒

$w_5(100) = 0.007 + \left[\frac{100}{10} * 5\right] + \left[\frac{100}{20} * 0.015\right] +$

$\left[\frac{100}{50} * 0.01\right] + \left[\frac{100}{50} * 0.01\right] =$

$= 50.122$ ⇒ Tash3 scheduleed

⑥ Time Demand [load 2] ⇒

$w_6(100) = 12 + \left[\frac{100}{10} * 5\right] + \left[\frac{100}{20} * 0.015\right]$

$+ \left[\frac{100}{50} * 0.01\right] + \left[\frac{100}{50} * 0.01\right]$

$+ \left[\frac{100}{100} * 0.007\right]$

$= 62.122$ → Tash is Shedaled

Test 2

Using Simso offline simulator

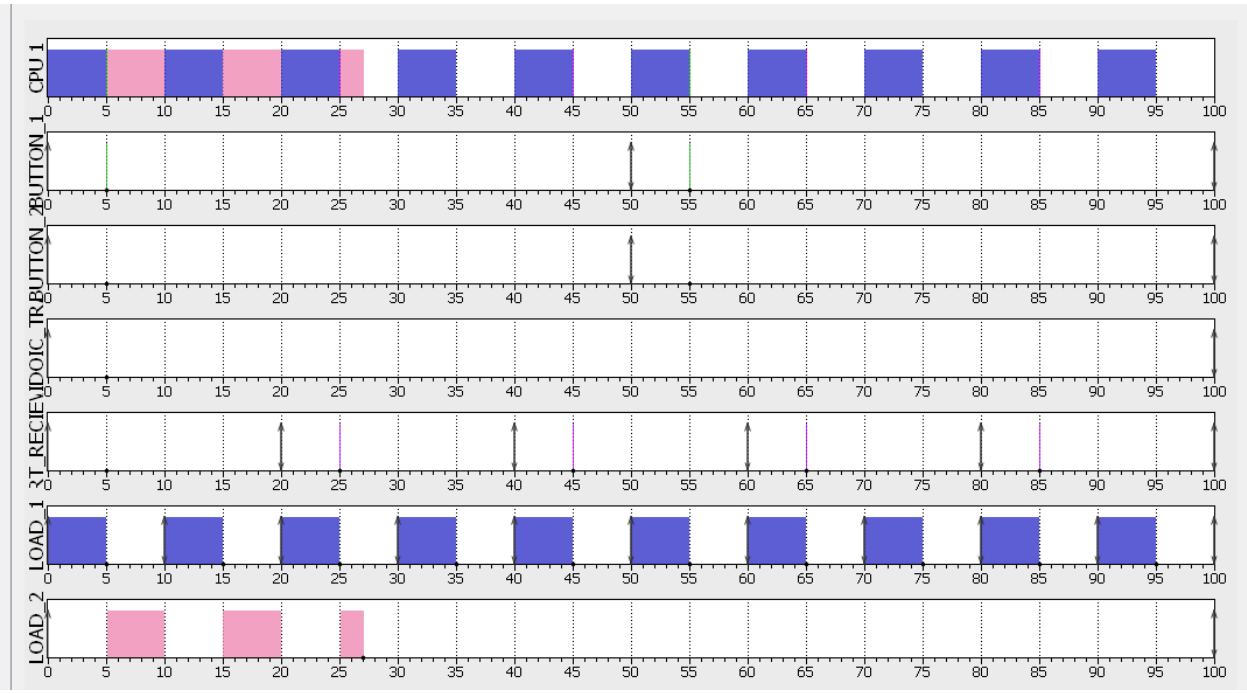
* FILE.xml

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)
1	BUTTON_1	Periodic	No	0.0	50.0	-	50.0	0.01
2	BUTTON_2	Periodic	No	0.0	50.0	-	50.0	0.01
3	PERIDOIC_TRANS	Periodic	No	0.0	100.0	-	100.0	0.007
4	UART_RECIEVER	Periodic	No	0.0	20.0	-	20.0	0.015
5	LOAD_1	Periodic	No	0.0	10.0	-	10.0	5.0
6	LOAD_2	Periodic	No	0.0	100.0	-	100.0	12.0

Scheduler ----→ Rate_Monotonic

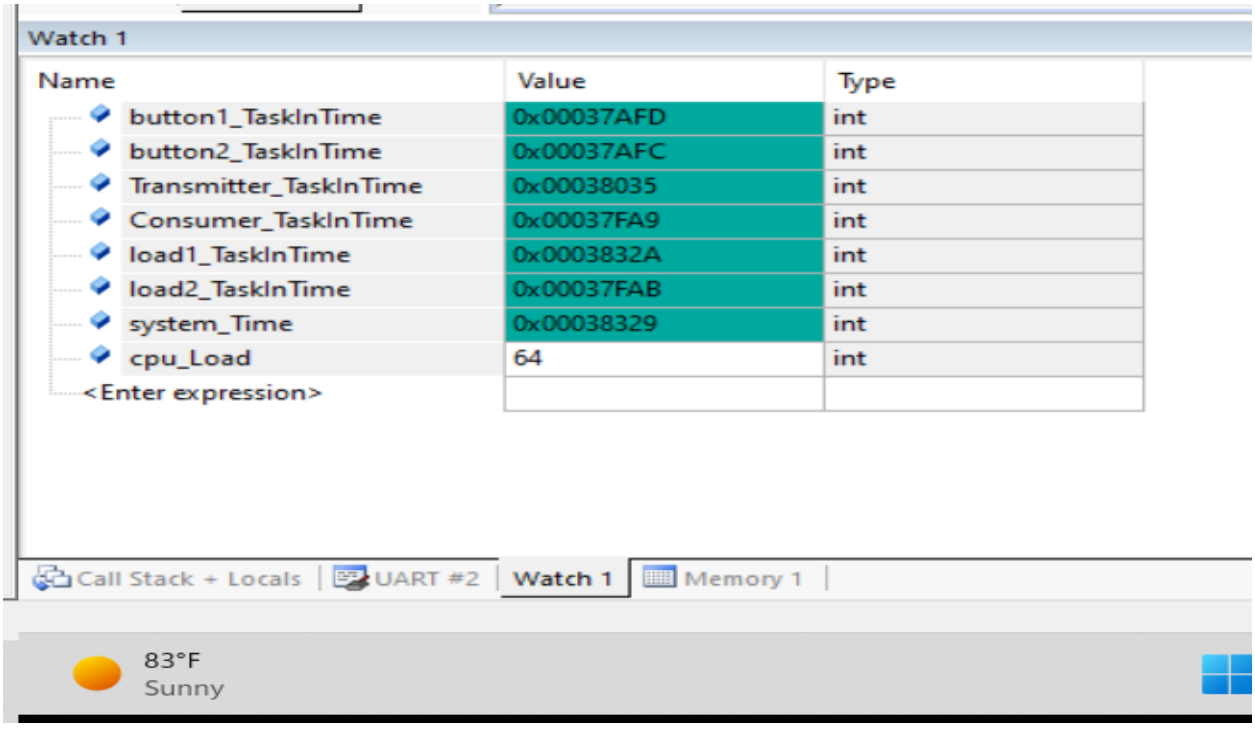
Simulation :



Load_2_Simulation Task is preempted by Load_1_Simulation Task as it has lower periodicity

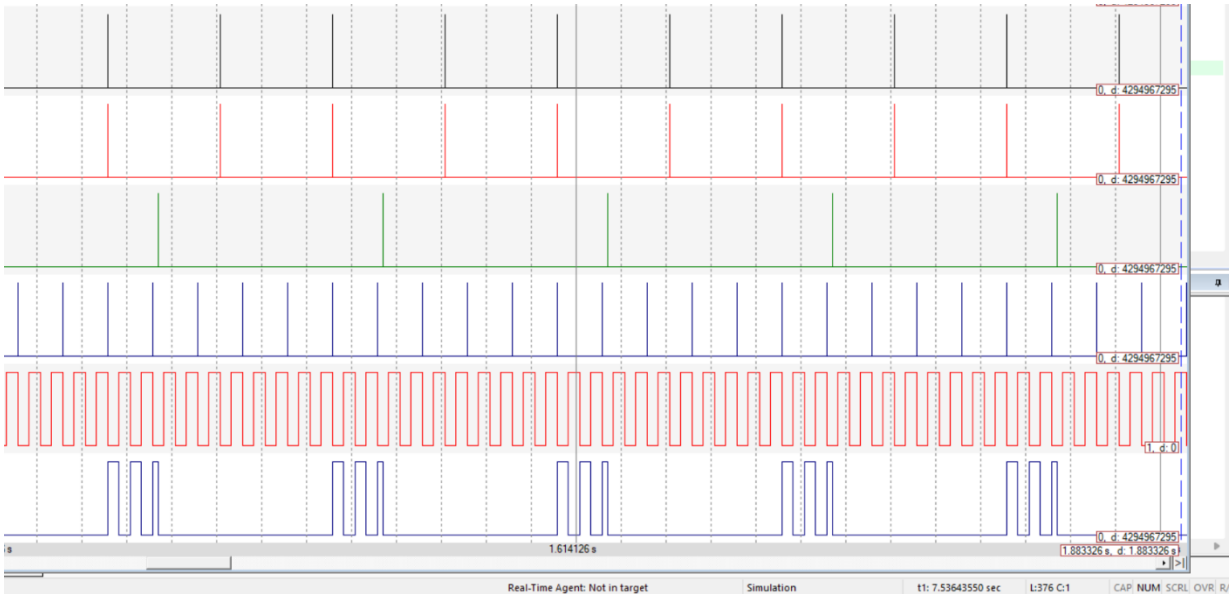
The Execution Time of the rest is too small.

Using Keil simulator in run-time



CPU_LOAD is from 62% to 64% then System Implementation is Successful

Using Gpios



Load_1_Simulation Task is executed first as it has the Earliest DeadLine then Uart_Receiver

Then Button_1_Monitor & Button_2_Monitor (Same Deadline) then Periodic_Transmitter.

Thanks A lot