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EDF Scheduler

IMPLEMENTATION OF EDF SCHEDULER REPORT

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Task	Periodicity	Deadline	Execution time	Occurrence over hyperperiod
Button 1 monitor	50ms	50ms	6.8µs	2
Button 2 monitor	50ms	50ms	6.8µs	2
Periodic Tx	100ms	100ms	71.4µs	1
Uart Rx	20ms	20ms	15.5µs	5
Load 1	10ms	10ms	5ms	10
Load 2	100ms	100ms	12ms	1

System hyperperiod

From the table we can see that the LCM between the tasks is 100ms

So the hyperperiod = LCM(50,50,100,20,10,100) = 100ms

CPU Load

U = (((6.8µ * 2) + (6.8µ * 2) + (71.4µ * 1) + (15.5µ * 5) + (5 * 10) + (12 * 1))/100) * 100%

= 62.17%

System Schedulability

1. Rate Monotonic
   U = (6.8µ/50m) + (6.8µ/50m) + (71.4µ/100) + (15.5µ/20) + (5m/10m) + (12m/100m) = 0.6242

   URM = 6(2^(1/6) – 1) = 0.73477

   U < URM So system is Schedulable

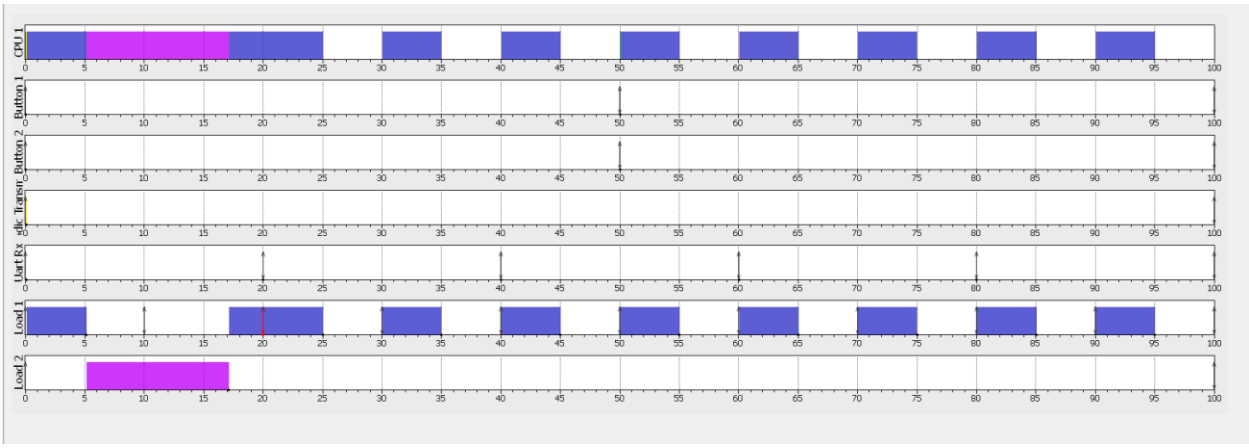
2. Time demand
   - For Load 1 (E: 5ms , P: 10ms, D: 10ms)
     $W_1(10) = 5m + 0 = 5$,
     w(10) = 5 < 10 So Load 1 is schedulable
   - For Uart Rx (E: 100µs, P: 20ms, D: 20ms):
     $W_2(20)$ = 15.5µs + (20/10) * 5 = 10.01
     W(20) = 10.01 < 50ms
     So Uart Rx is schedulable
   - For Button 1 (E: 6.8µs, P: 50, D: 50ms)
     $W_3(50)$ = 6.8µs + (50/10) * 5ms +(50/20) * 15.5µs = 25.04< 50ms
     So Button 1 is schedulable
   - For Button 2 (E: 6.8µs, P: 50, D: 50ms)
     $W_3(50)$ = 6.8µs + (50/10) * 5ms +(50/20) * 15.5µs + (50/50)*6.8= 25.05< 50ms
     So Button 2 is schedulable
   - For Periodic Transmitter (E:71.4µs, P: 100ms, D: 100ms):

     $W_5(100)$ = 71.4µs + (100/10) * 5ms +(100/20) * 15.5µs + (100/50)*6.8 + (100/50)*6.8 = 50.2 < 100 So Periodic Tx is schedulable

   - For Load 2 (E: 12ms, P: 100ms, D: 100ms):
     $W_6(100)$ = 12ms + (100/10) * 5ms +(100/20) * 15.5µs + (100/50)*6.8 + (100/50)*6.8 + (100/100) * 71.4µs = 62.17 < 100 So Load 2 is schedulable

   As all the tasks is schedulable, therefore System is schedulable.

Simso



Keil (Logic Analyzer) Simulation