EDF scheduler

the system hyperperiod

Button_1 = 50

Button_2 = 50

Periodic _Transmitter = 100

Uart_Receiver = 20

Load_1 = 10

Load_2 = 100

Hyperperiod = 100

the CPU load

CPU load = Total Execution Time During Hyperperiod / Hyperperiod

For One Hyperperiod

Button_1 = 2*13 us

Button_2 = 2*13 us

Periodic _Transmitter = 1*20 us

Uart_Receiver = 5*15 us

Load_1 = 10*5 ms

Load_2 = 1* 12 ms

CPU Load = ((0.0013 * 2) + (0.0013 * 2) + (0.0020 * 1) + (0.0015 * 5) + (5 * 10) +(12 * 1)) /100 = 0.620147 =62.0147%

system schedulability

Rate-Monotonic

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

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

U =0.620147 =62.0147%

$URM = n$ **(2^(1/** n**) − 1) = 6(2^(1/ 6) − 1) = 0.7347 = 73.47%**

$Therefore,\ \ U <$ **URM**

Therefore, The system is feasible (Schedulable).

Time Demand Analysis

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

By deadline :

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

Load1 is schedulable.

Uart_Receiver : W(20) = 0.0015 + (20/10) * 5 = 10.0015, W(20) is less than deadline for UART (20).

Uart_Receiver is schedulable.

Button_1: W(50) = 0.0013 + (50/20) *0.0015 + (50/10) * 5 = 25.0505, W(50) is less than deadline for Button (50).

Button_1 is schedulable.

Button_2:W(50) = 0.0013 + (50/20) *0.0015 + (50/10) * 5 + (50/50) * 0.0013 = 25.0635, W(50) is less than deadline for Button (50).

Button_2 is schedulable.

Periodic_Transmitter: W(100) = 0.0020 + (100/20) *0.0015 + (100/10) *5 +(100/50) * 0.0013 + (100/50) * 0.0013 = 50.0147, W(100) is less than deadline for Periodic (100).

Periodic_Transmitter is schedulable.

Load2: W(100) = 12 + (100/20) * 0.0015 + (100/10) * 5 + (100/50) * 0.0013 + (100/50) * 0.0013 + (100/100) * 0.0020 = 62.0147, W(100) is less than deadline for Load2 (100).

Load2 is schedulable.

Therefore the system is Schedulable