Implementation Of EDF Scheduler

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**Analytical Method Verification**

1-System Hyper Period

|  |  |
| --- | --- |
| Task | Periodicity (ms) |
| Button\_1\_Monitor | 50 |
| Button\_1\_Monitor | 50 |
| Transmitter | 100 |
| UART | 20 |
| Load\_1 | 10 |
| Load\_2 | 100 |

Hyperperiod = Least common Multiplier of all Periods

= 100 ms

* That means all task or gannt chart repeats itself every 100ms

2- CPU Load

🡪We calculate execution time of every task from Keil simulatior using Logic analyzer and cursor.

|  |  |  |
| --- | --- | --- |
| Task | Execution Time | Periodicity |
| Button\_1\_Monitor | 13 µs | 50 |
| Button\_2\_Monitor | 13 µs | 50 |
| Transmitter | 17,3 µs | 100 |
| UART | 23,3 µs | 20 |
| Load\_1 | 5 ms | 10 |
| Load\_2 | 12 ms | 100 |

U = Total Exec. Time during one Hyper-Period / Hyper-Period

= [ (0.013 x 2) + (0.013 x 2) + (0.0173) + (0.0233 x 5) + (5 x 10 ) + (12) ] / 100

= 62.3415 %

2- Schedulability

**Rating Monotonic Utilization Bound**

U ≤ n[ 2 ^ (1/n) -1] ; n🡪 no. of Tasks

URM = n [2 ^ (1/n) - 1] = 6 [2 ^ (1/6) - 1] = 0.7347

U = ∑ C / P = (0.013/50) + (0.013/50) + (0.0173/ 100) + (0.0233 / 20) + (0.05) + (0.12) = 0.621858

Since U < URM, So the system is indeed Schedulable.

**Time Demand Analysis**

Arrangement of Tasks would be.

1- Load 1 🡪 T1

2- UART 🡪 T2

3- Button 1 🡪 T3

4- Button 2 🡪 T4

5- Transmitter 🡪 T5

6- Load 2 🡪 T6

T1 Calculations