Schedulability Calculation

1) Define Tasks.

- Task (1): {Periodicity: 50 , Deadline: 50 , Execution time: 0.018ms }
- Task (2): {Periodicity: 50 , Deadline: 50 , Execution time: 0.018ms }
- Task (3): {Periodicity: 100 , Deadline: 100 , Execution time: 0.084ms }
- Task (4): {Periodicity: 20 , Deadline: 20 , Execution time: 0.025ms }
- Task (5): {Periodicity: 10 , Deadline: 10 , Execution time: 5ms }
- Task (6): {Periodicity: 20 , Deadline: 20 , Execution time: 12ms }

2) Analytic Method (Rate - Monotonic).

$$U = \sum_{i=1}^{n} \frac{C_i}{P_i} \leq n(2^{\frac{1}{n}} - 1)$$

U = Total Utilization
C = Execution time
P = Periodicity
N = Number of tasks

a. With 6 Tasks

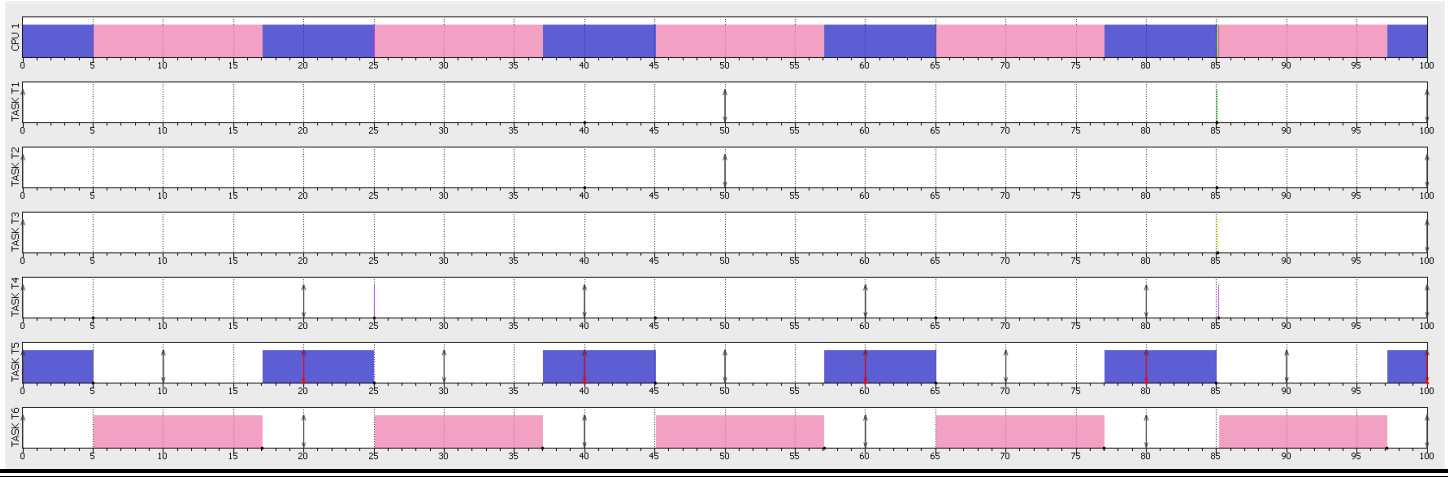
- Hyper Period =100ms
- CPU(LOAD)=2(0.018/50)+(0.084/100)+(0.025/20)+(15/10)+(12/20)=1.10281
- URM=6*(2^(1/6)-1)=0.7347
- System Is Not Schedulable.

b. With 5 Tasks

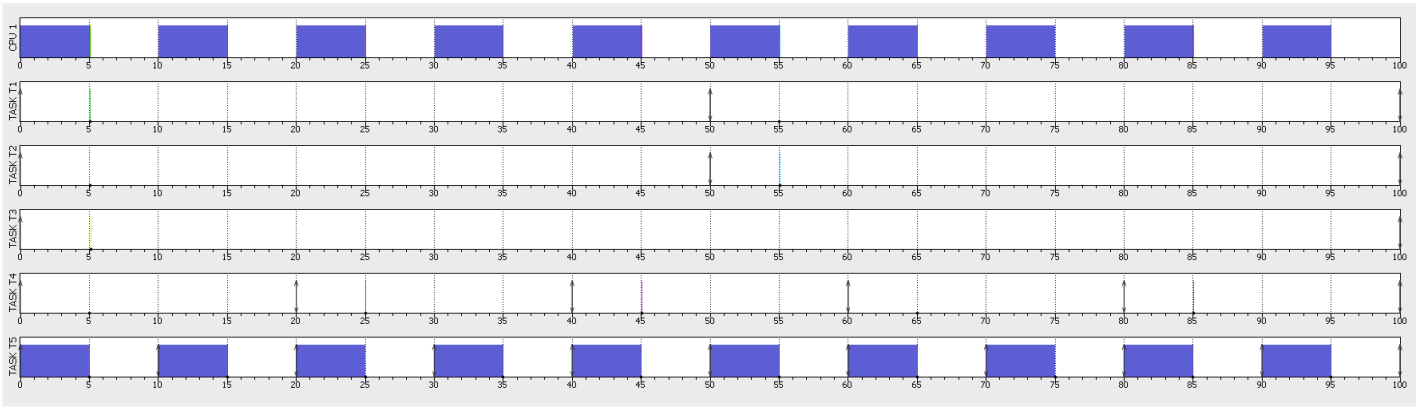
- Hyper Period =100ms
- CPU(LOAD)=2(0.018/50)+(0.084/100)+(0.025/20)+(5/10)=0.50281
- URM=5*(2^(1/5)-1)=0.743.
- System Is Schedulable.

3) SimSo Simulation

a. With 6 Tasks

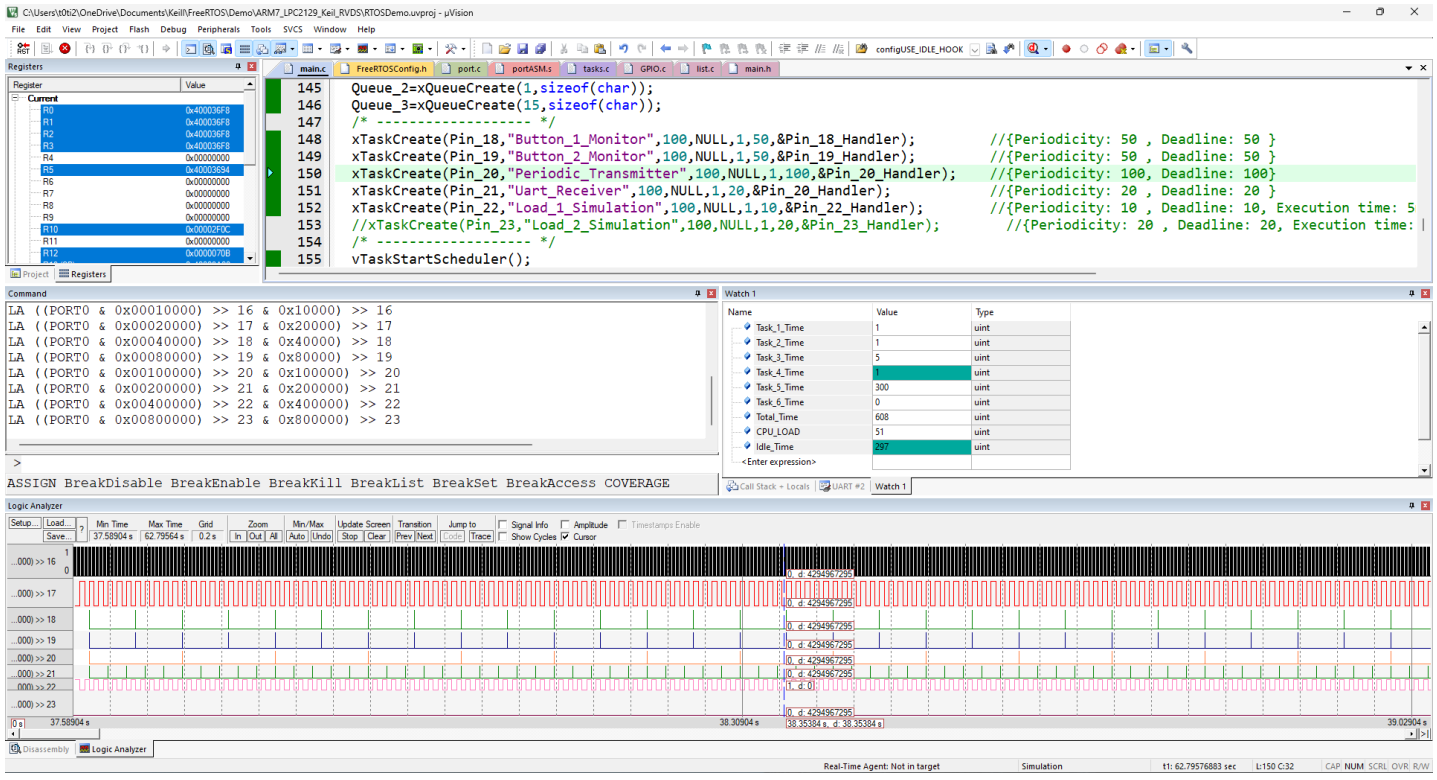


b. With 5 Tasks



4) Keil Simulation

c. With 5 Tasks



Name	Value	Type
Task_1_Time	1	uint
Task_2_Time	1	uint
Task_3_Time	5	uint
Task_4_Time	1	uint
Task_5_Time	300	uint
Task_6_Time	0	uint
Total_Time	608	uint
CPU_LOAD	51	uint
Idle_Time	299	uint
<Enter expression>		

d. With 4 Tasks