

EDF SCHEDLER IMPLEMENTATION REPORT

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TASKS LIST

Task Number	Execution Time	Periodicity
Task 1	17.7 us	50 ms
Task 2	18.1 us	50 ms
Task 3	21.25 us	100 ms
Task 4	32.9 us	20 ms
Task 5	5 ms	10 ms
Task 6	12 ms	100 ms

HYPERPERIOD

Hyper period = LCM (50,50,100,20,10,100) = **100 ms**

CPU LOAD

CPU load = Total task execution time over hyper period / hyper period

$$= (17.7 * 2 \text{ us} + 18.1 * 2 \text{ us} + 21.25 \text{ us} + 32.9 * 5 \text{ us} + 5 * 10 \text{ ms} + 12 \text{ ms}) / 100 \text{ ms} = 0.6225 = \mathbf{62.25 \%}$$

SYSTEM SCHEDULABILITY CHECK

RATE MONATONIC

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

Where n is the number of tasks, U is the CPU load;

$$URM = 6 (2^{1/6} - 1) = 0.73$$

$$\mathbf{U = 0.6225 < URM}$$

So the System is Schedulable

TIME DEMAND

$$W_i = e_i + \sum_{k=1}^{i-1} \left\lceil \frac{t}{p_k} \right\rceil e_k$$

W = Worst response time

E = Execution time

P = Periodicity

T = Time instance

$$W_1(50) = 17.7 \text{ us} + 18.1 \text{ us} + 3 * (32.9 \text{ us}) + 5 * (5 \text{ ms})$$

$$= 25.13 < 50 \quad \text{Task 1 is \textcolor{teal}{Schedulable}}$$

$$W_2(50) = 17.7 \text{ us} + 18.1 \text{ us} + 3 * (32.9 \text{ us}) + 5 * (5 \text{ ms})$$

$$= 25.13 < 50 \quad \text{Task 2 is \textcolor{teal}{Schedulable}}$$

$$W_3(100) = 21.25 \text{ us} + 2 * 17.7 \text{ us} + 2 * 18.1 \text{ us} + 5 * 32.9 \text{ us} + 10 * 5 \text{ ms} + 12 \text{ ms}$$

$$= 62.25 < 100 \quad \text{Task 3 is \textcolor{teal}{Schedulable}}$$

$$W_4(20) = 32.9 \text{ us} + 2 * 5 \text{ ms}$$

$$= 10.03 < 20 \quad \text{Task 4 is \textcolor{teal}{Schedulable}}$$

$$W_5(10) = 5 \text{ ms} + 0$$

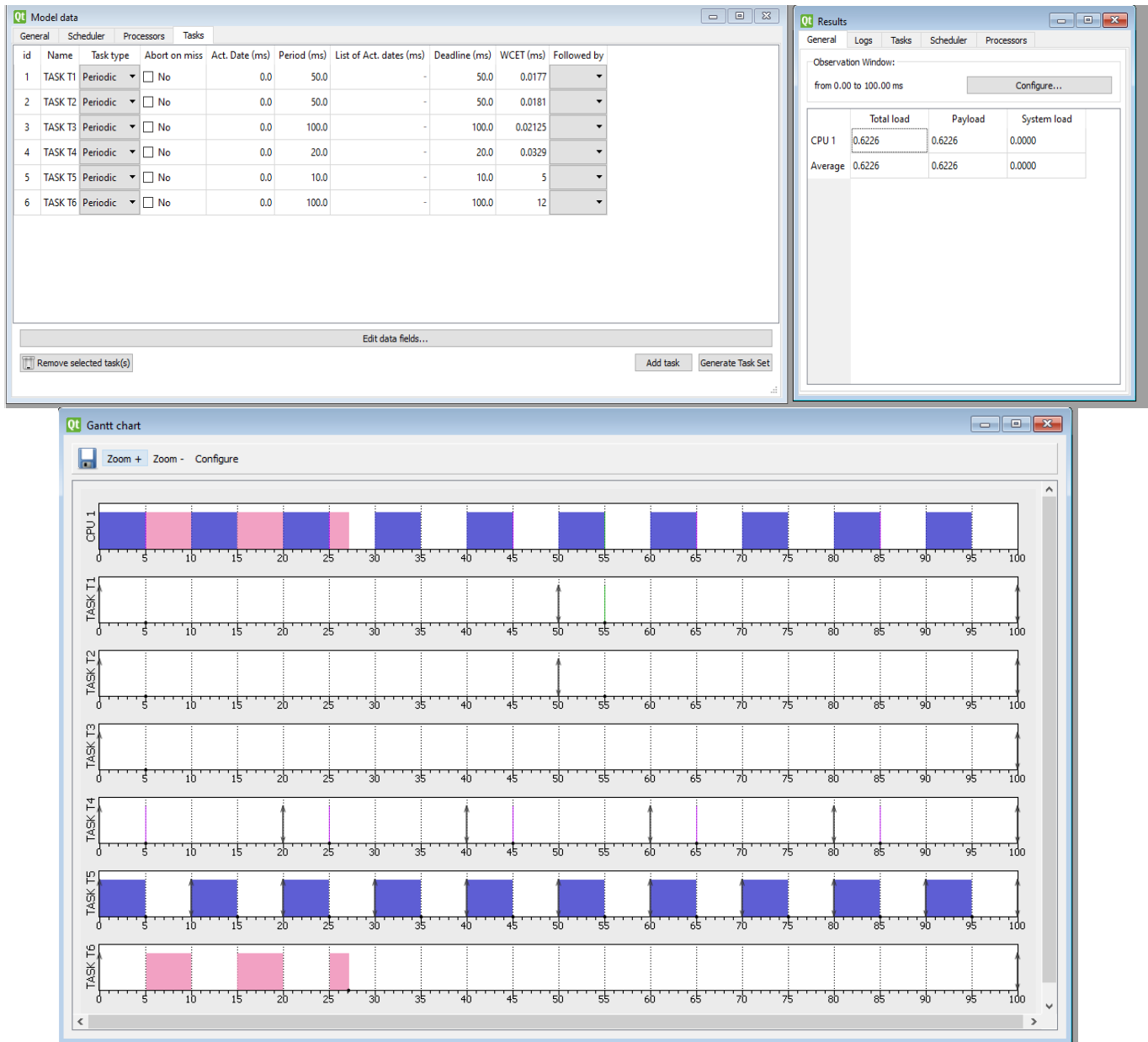
$$= 5 < 10 \quad \text{Task 5 is \textcolor{teal}{Schedulable}}$$

$$W_6(100) = 12 \text{ ms} + 2 * 17.7 \text{ us} + 2 * 18.1 \text{ us} + 21.25 + 5 * 32.9 \text{ us} + 10 * 5 \text{ ms}$$

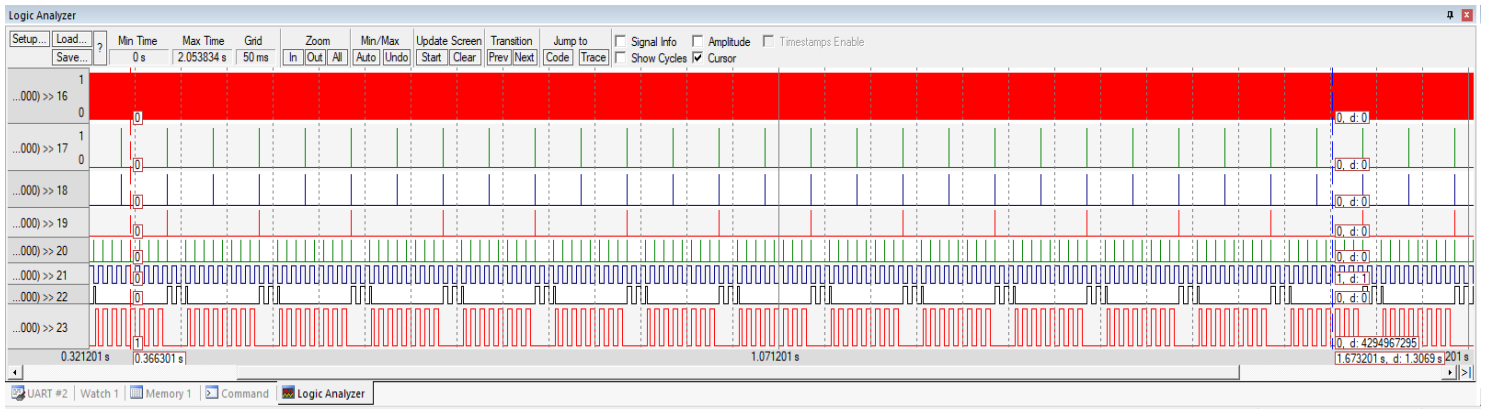
$$= 62.25 < 100 \quad \text{Task 6 is \textcolor{teal}{Schedulable}}$$

SCREENSHOTS

SIMSO



LOGIC ANALYZER



CONCLUSION

The system is schedulable and everything is working as expected.