Free RTOS MasterClass

Graduation Project

Implementation Of EDF Scheduler On Free RTOS

By: Ahmed Abdelhamid Shokry

Task Set Table:

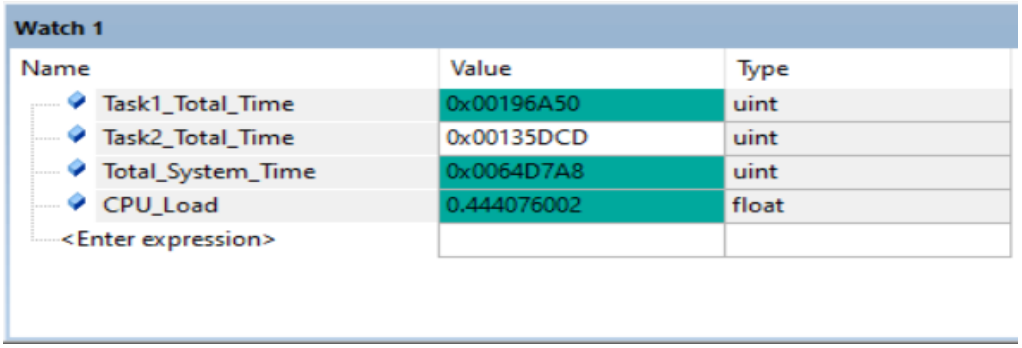
Task Number (n)	Periodicity (P)	Execution time (C)	Deadline (D)
1	60	15.1	60
2	80	15.28	80

Calculating The CPU Load

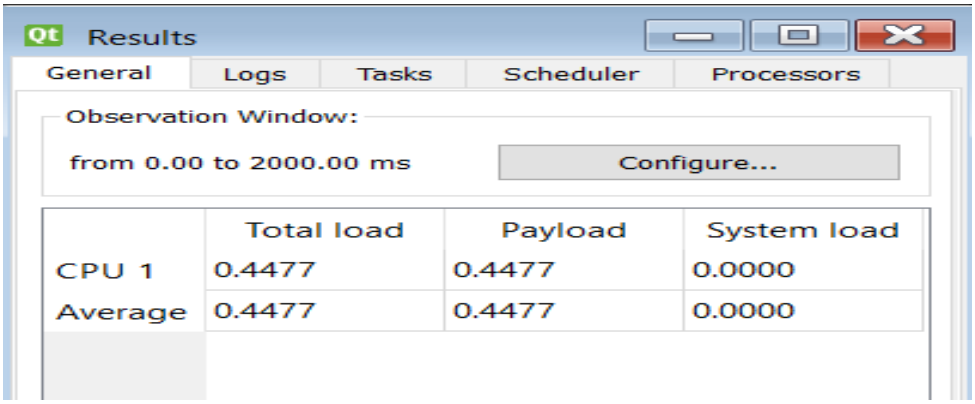
Hand Analysis:

$$U = \frac{15.1}{60} + \frac{15.28}{80} = 0.4426 \approx 44\%$$

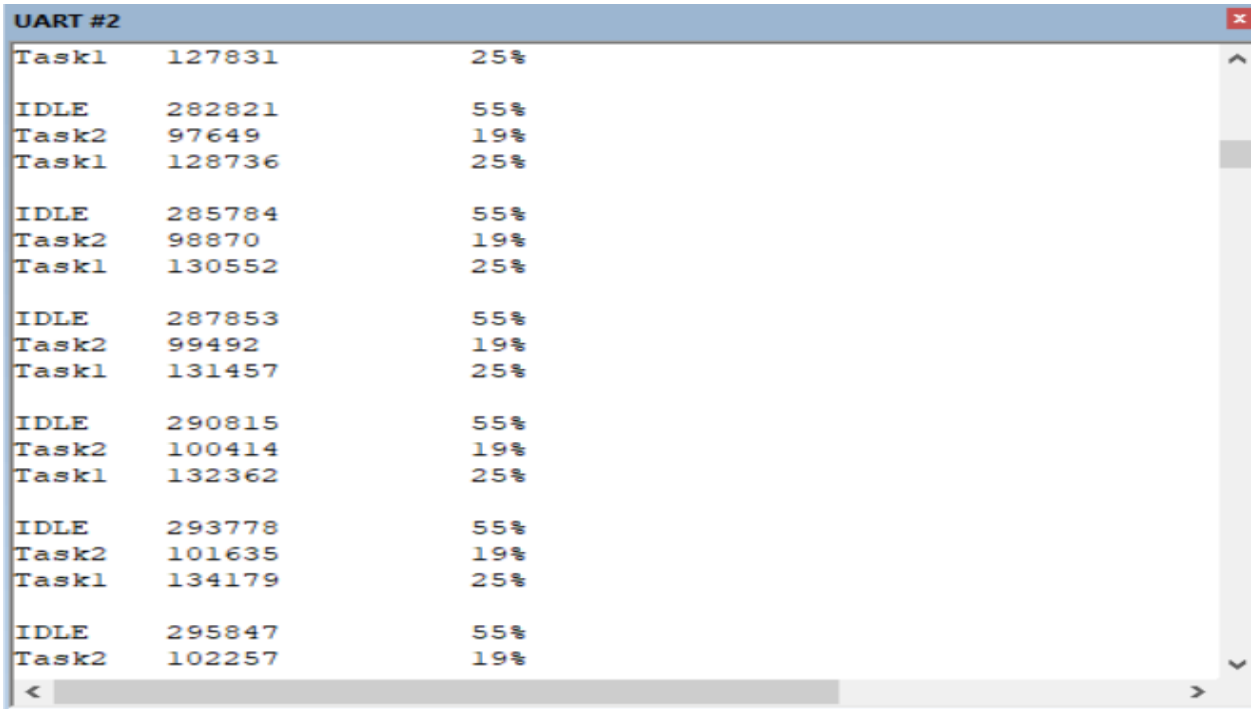
Analysis Using Trace Task Functions:



Analysis on Simso:



Runtime Analysis:

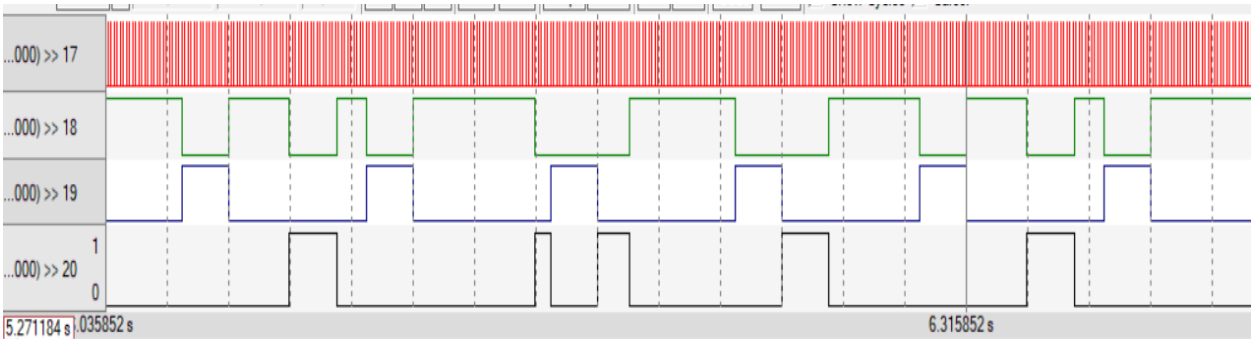


System Total time = 293778 + 101635 + 134179 = 529592

CPU Load = U = $\frac{101635 + 134179}{529592} = 0.4452 \approx 44\%$

Checking The Schedulability

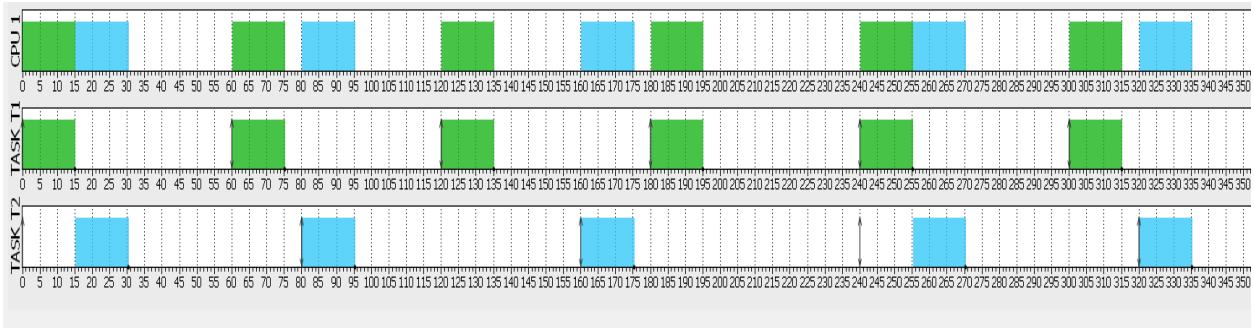
During Runtime:

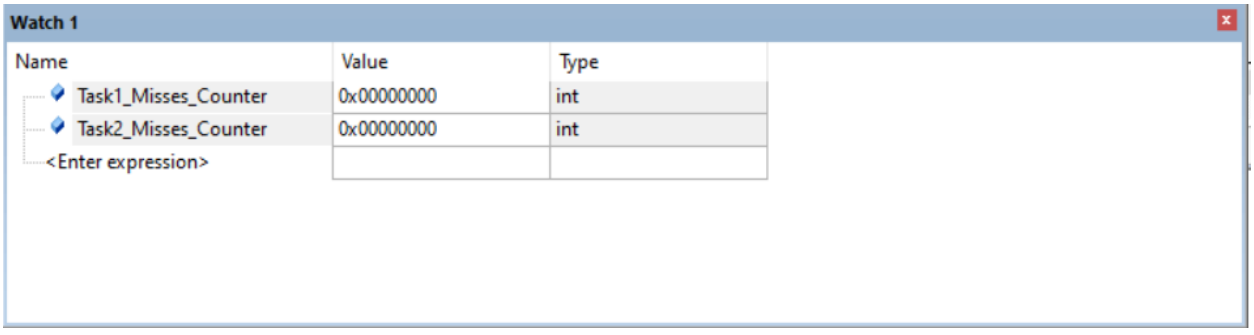


Task1 is indicated in blue color

Task2 is indicated in black color

Using Simso:





Comments:

- From The Graphs provided we can see that no task misses its deadline
- For the task set chosen above we obtain U = 0.442
- For EDF Schedulers the system is considered Schedulable if U<=1
- As U = 0.442 < 1 so the system is guaranteed to be Schedulable
- The total CPU Load = 44 % which is considered reasonable
- The Hand analysis , Runtime analysis and simulation all provide the same results for the CPU Load calculations
- The CPU Load can be decreased further more by increasing the periodicity of Task1 or Task2