Healthcare System Design

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Table of content:

1 - Tasks needed :
This system has 5 periodic tasks

2 - **Tasks Parameter :**

Task 1 : Task name : Touch LCD
Periodicity : 25 ms to keep data up to date
Execution time : 2 ms
Deadline : 25 ms
Priority : 5

Task 2 : Task name : Blood pressure sensor
Periodicity : 25 ms
Execution time : 3 ms
Deadline : 25 ms
Priority : 2

Task 3 : Task name : Heart beat detector
Periodicity : 100 ms
Execution time : 1.5 ms
Deadline : 100 ms
Priority : 3

Task 4 : Task name : Temperature sensor
Periodicity : 10 ms
Execution time : 2.5 ms
Deadline : 10 ms
Priority : 4

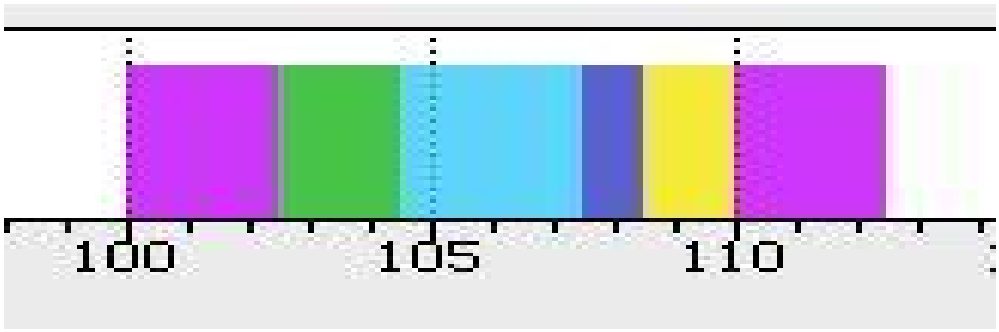
Task 5 : Task name : Alert siren
Periodicity : 25 ms to check the data every change
Execution time : 1 ms
Deadline : 25 ms
Priority : 1

System Tick Rate:

Total Execution time = 2 + 3 + 1.5 + 2.5 + 1 = 10 ms
So we can choose tick time = 12 ms

Hyperperiod Calculation:

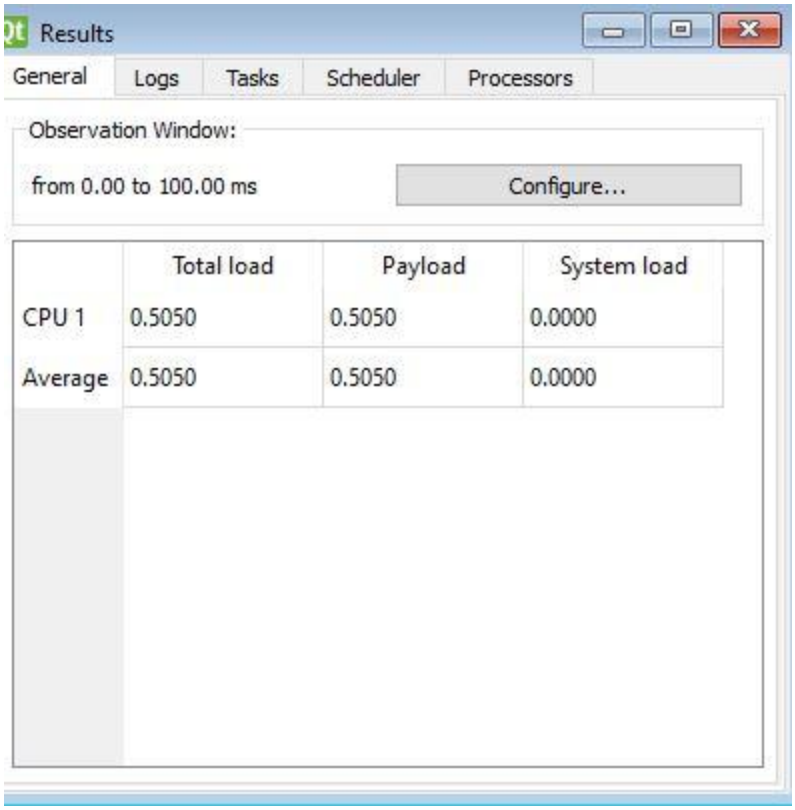
LCM for 25, 25, 100, 10 and 25 is 100 ms



As it appears in the above screenshot, all tasks are run after 100 ms as it is the hyperperiod.

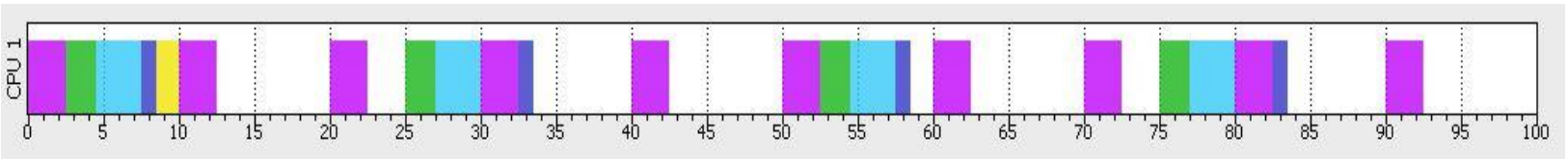
CPU load:

CPU load = ((2 * 4) + (3 * 4) + (1.5 * 1) + (2.5 * 10) + (1 * 4)) / 100 = 50.5 / 100 = 50.5 %



As it appears in the above screenshot, the CPU load is 50.5%

Tasks timeline:



This is the Tasks's timeline