Project 2
FWD nanodegree
FreeRTOS portion Report

Main object :

-Implement EDF scheduler based on FerrRTOS OS using a paper given and add all needed edits to make the EDF.

-Test and analyze code with a given set of tasks.

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/***/

Task 1: ""Button_1_Monitor"", {Periodicity: 50, Deadline: 50}
“Execution time : 15us ”

Task 2: ""Button_2_Monitor"", {Periodicity: 50, Deadline: 50}
“Execution time : 15us ”

Task 3: ""Periodic_Transmitter"", {Periodicity: 100, Deadline: 100}
“Execution time : 20us

”

Task 4: ""Uart_Receiver"", {Periodicity: 20, Deadline: 20}
“Execution time : 22us ”

Task 5: ""Load_1_Simulation"", {Periodicity: 10, Deadline: 10}
“Execution time : 5ms ”

Task 6: ""Load_2_Simulation"", {Periodicity: 100, Deadline: 100}
“Execution time : 12ms ”

*System total hyperPeriod = 100ms

*CPU load : 0.622 (for a 100 ms executions only 62.2 ms was busy)

*Check stimulability of EDF :

(2*(12us/50ms)+(20us/100)+(22us/20ms)+(5ms/10ms)+(12ms/100ms)) less than 1 so system is schedulable.

EDF scheduler analysis:

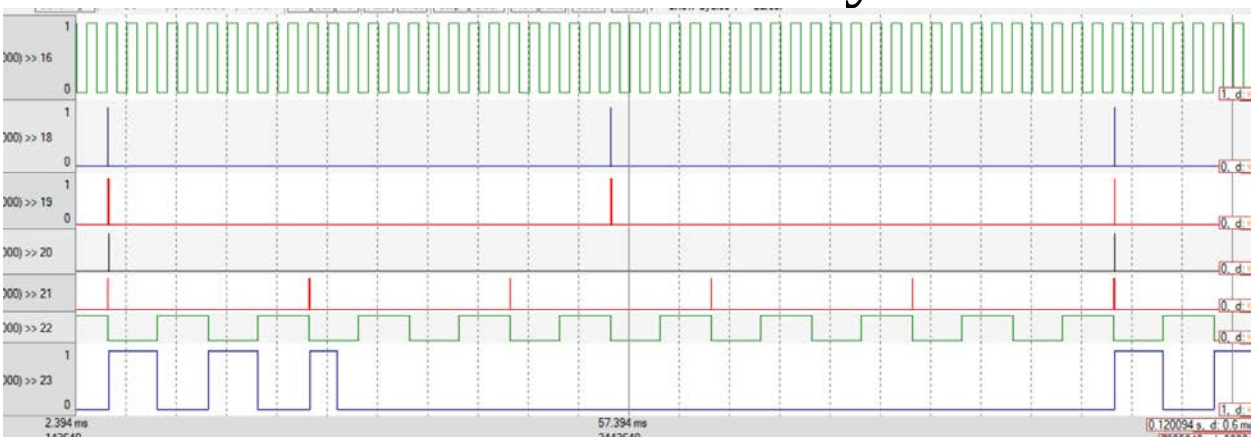

Fig1: Keil logic analyzer for EDF scheduler with tasks provided

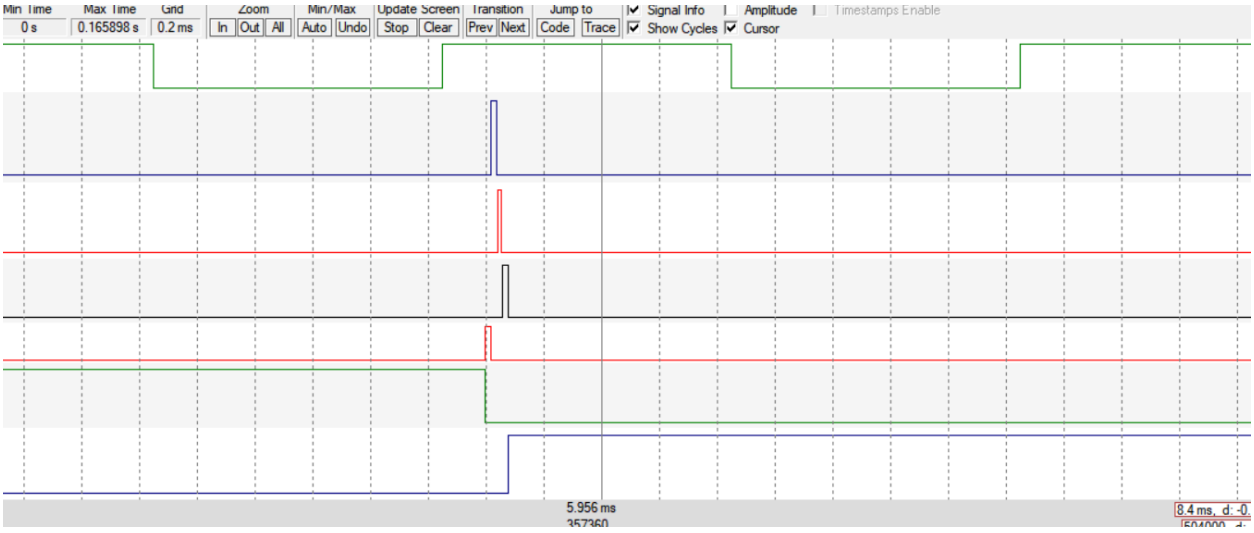

Fig2: Keil logic analyzer for EDF scheduler with tasks provided(zoomed)

Exactly as exepected

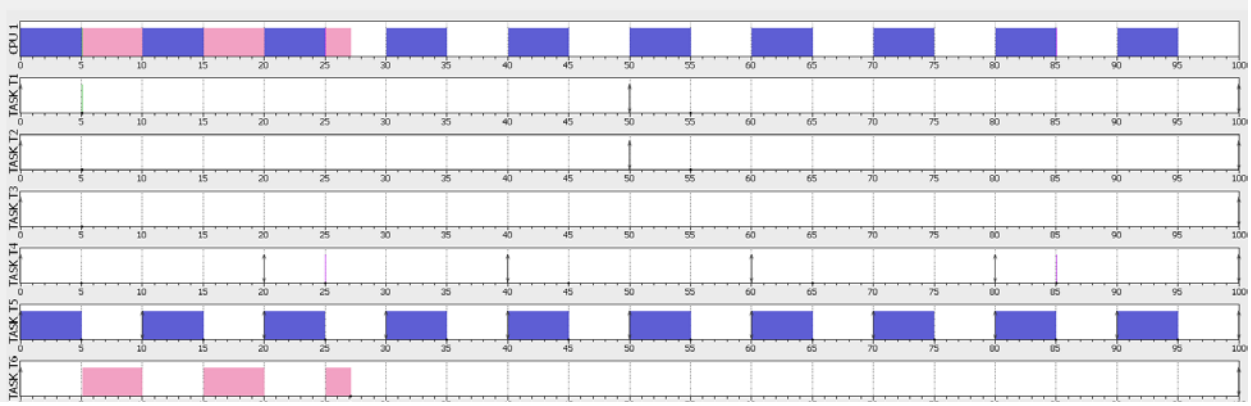

Fig3: Simso EDF scheduler for tasks giver(a total hperperiod)

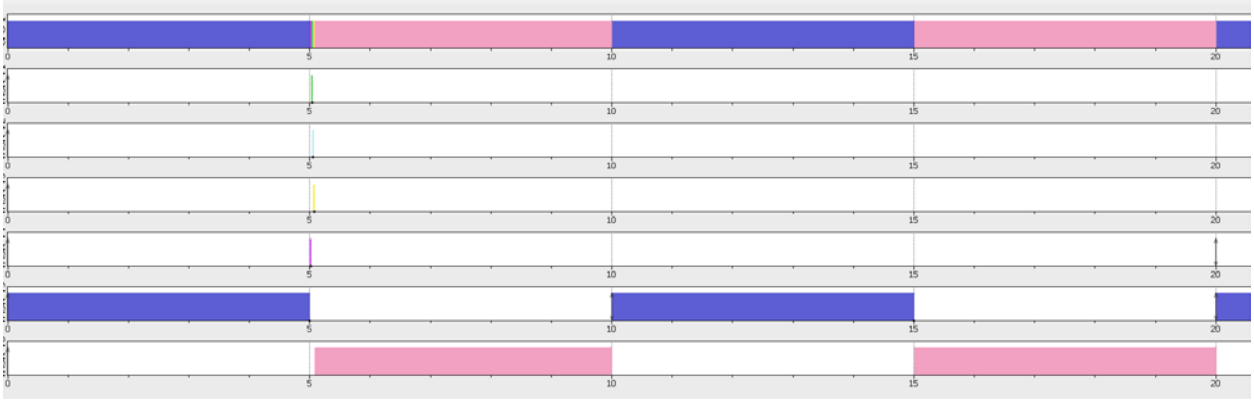

Fig4: Simso EDF scheduler for tasks given (zoomed)

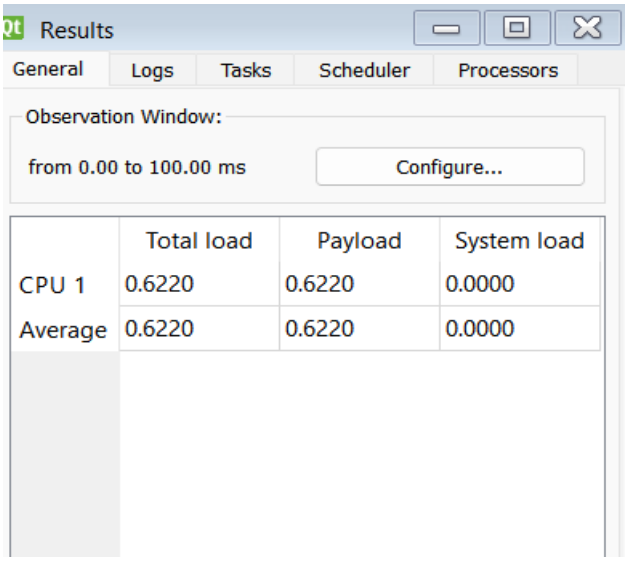

Fig5: Simso Results EDF(CPU load is fair)

Assuming RateMonotonic:

*Tasks assigned inversely proportional to the period.
*Fixed priority scheduler used.

Fig6: Simso Gant chart(RateMonotonic)

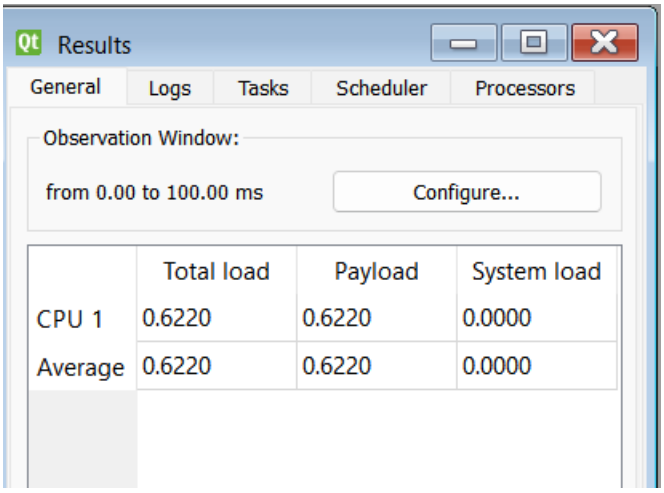

Fig7: Simso Results (RateMonotonic)

Included in the file :

- tasks.c -main.c - freertosconfig.h