Real Time Systems

Assignment 3

Maximum Credit:25   **Submission deadline : 10th Feb 2021 Midnight**

Live presentation   : 11/12 Feb 2021

Objective

There is no built-in support for EDF-based scheduling in FreeRTOS. You will write additional APIs, which will implement EDF algorithm with the help of FreeRTOS scheduler. You will have to write the code in C.

Task 1: Write a header file associated source code for the following APIs

a) getTemperature() → Should return a random temperature value between 20 and 100

b) getPressure() → Should return a random value between 1 and 10

c) getHeight() → Should return a random value between 0 and 1000

Task 3:

Write an application software which generates periodic tasks corresponding to temperature reading, pressure reading and height reading and displaying them on the terminal along with the current tick time. The period of these tasks (in terms of absolute time and not ticks) and their priority should be configurable through a parameters in a header file

Task 4:

Write the function vScheduleEDF(), which will schedule the tasks that you have created based on EDF algorithm. The number and type of arguments that the function accepts can be defined by you. This scheduler may internally use any FreeRTOS API functions.

Files to Submit

a) A single zip file containing the files that you have written. No need to submit the FreeRTOS source files (use FreeRTOS Version 2020.12.00).

b) The zip folder should also contain a .txt file mentioning the contribution of each team member.

Demonstration

A live demo will be conducted, where you will show me the actual working and execution of the code.