ECEN 5623

Homework set 3

Due as indicated on Canvas

These problems should be done **individually**, not with your project partner or any other classmate. You may have to share the dev kit with your partner.

Using FreeRTOS running on a TI TIVA board or Altera DE1-SoC, do problems 10.1, 10.2, and 10.3 from the text:

1. Create a user-defined interrupt handler for the timer ISR and a task for processing. The timer should be scheduled on a regular basis, and the interrupt handler should signal the processing task. To ensure that the timer is being triggered with the correct periodicity, pass the interrupt timing to the processing task.
2. Create a pair of FreeRTOS tasks that signal each other. The first task performs some computation, signals the other task, and waits for a signal from that task. The second task repeats the same pattern so that they alternate. Each task should complete a defined amount of work, such as computing a specified number of Fibonacci values or some equivalent synthetic load. Do not use sleep functions as a load. Profile each task, by storing timestamps that can be printed at the end, with one task executing for 10 ms and the other for 40 ms. Run for at least 200 ms. Printing can be done using UARTprintf().
3. Modify the timer ISR to signal two tasks with different frequencies: one task every 30 ms and the other every 80 ms. Use your processing load from #2 to run 10 ms of processing on the 30-ms task and 40 ms of processing on the 80-ms task. Produce logs that show you have done this.

Submit your code as .c and .h files and also pasted in a word or pdf file along with screenshots of your logs for your homework submission.