

ECEN 5623
Homework set 3

- 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.**

```
Welcome!
Task 1!

Interrupt Tick Value = 500
Interrupt Tick Value = 1000
Interrupt Tick Value = 1500
Interrupt Tick Value = 2000
Interrupt Tick Value = 2500
Interrupt Tick Value = 3000
Interrupt Tick Value = 3500
```

This code involves a software Timer Handler which signals a task using a semaphore and updates the time of the timerhandlercall function which is printed in the task i.e. Interrupt Tick Value.

- 2. Create a pair of 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. Profile each task so that one task is executing for 10 ms and the other for 40 ms.**

```
Welcome!
Task 1!
Task 2!

tick_count1 = 10
tick_count2 = 40
tick_count1 = 10
tick_count2 = 40
tick_count1 = 10
tick_count2 = 40
```

This code involves two tasks which signal each other using two semaphores to synchronize execution of one task after another. Two timers are used to generate synthetic load using Fibonacci series for 10ms and 40ms respectively.

- 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.**

```
Welcome!

Task 1!

Task 2!

tick_count1 = 12

Time taken for the task1 = 31

tick_count1 = 8

tick_count2 = 40

Time taken for the task1 = 27

tick_count1 = 9

Time taken for the task2 = 79

Time taken for the task1 = 30

tick_count1 = 8

tick_count2 = 39

Time taken for the task1 = 27

tick_count1 = 7
```

This code involves creation of two software timers of 10ms and 40ms to synchronize two tasks with request time of 30ms and 80ms which execute the synthetic load of Fibonacci series with execution time of 10ms and 40ms respectively.