University of Texas at El Paso
Electrical and Computer Engineering Department

EE4376 Laboratory for Microprocessors Systems II

LAB 01

FREE RTOS, TASKS AND SEMAPHORES

Goals:

- Given the program template shown in listing 1, edit it so that using free RTOS, you create four different tasks.
- Make task one run every two seconds. Task two should run twice as fast as task one. Task three should run every time either task one or task two run. And task four should run every time Task 3 runs.
- Print “Task X running” for every task in the console.

Bonus:

Modify the code so that you only use the delay function in one of the tasks. **+10**

Pre-Lab:

- What is the function used to create a task and what parameters are passed to it?
- What is the function used to create a binary semaphore and what parameters are passed to it?
- How could you synchronize two tasks?

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```
#include <stdio.h>
#include "sdkconfig.h"
#include "freertos/FreeRTOS.h"
#include "freertos/task.h"
#include "freertos/semphr.h"

SemaphoreHandle_t xSemaphore = NULL;

void task1(void *pvParameter)
{
   while(1) {
     printf("Task 1\n");
     vTaskDelay(2000/portTICK_PERIOD_MS);
   }
}

void app_main()
{
   xSemaphore = xSemaphoreCreateBinary();

   xTaskCreate(&task1,"task1",4096,NULL,5,NULL);
   xTaskCreate(&task2,"task2",4096,NULL,5,NULL);
   xTaskCreate(&task3,"task3",4096,NULL,6,NULL);
   xTaskCreate(&task4,"task4",4096,NULL,7,NULL);

}
```

Listing 1. Program template for Lab 1.