

## Lab 3

### Task 1

```
//The purpose of this program is to alternated between the three available colors on
the TIVA C board
//The lights will change every 50 milliseconds

#include <stdint.h>
#include <stdbool.h>
#include "inc/hw_types.h"
#include "inc/hw_memmap.h"
#include "driverlib/sysctl.h"
#include "driverlib/gpio.h"

int main(void)
{
    uint8_t ui8LED = 2;
    SysCtlClockSet(SYSCTL_SYSDIV_4|SYSCTL_USE_PLL|SYSCTL_XTAL_16MHZ|SYSCTL_OSC_MAIN);
    //set the clock to be 40 MHz
    // (Uses PLL = 400 MHz) => 400MHz / (2 * 5) = 40 MHz
    SysCtlPeripheralEnable(SYSCTL_PERIPH_GPIOF); //Enable the GPIO PORTF pins
    GPIOPinTypeGPIOOutput(GPIO_PORTF_BASE, GPIO_PIN_1|GPIO_PIN_2|GPIO_PIN_3);
    //Set pin 1, 2,3 at PORT F at outputs
    while(1)
    {
        // Turn on the LED
        GPIOPinWrite(GPIO_PORTF_BASE, GPIO_PIN_1|GPIO_PIN_2|GPIO_PIN_3, ui8LED);
        // Delay for a bit
        SysCtlDelay(2000000);
        // Cycle through Red, Green and Blue LEDs
        if (ui8LED == 8) {ui8LED = 2;} else {ui8LED = ui8LED*2;}
    }
}
```

### Task 2

```
//The purpose of this program is to alternated between the three available colors on
the TIVA C board
//The lights will change every 20 seconds

#include <stdint.h>
#include <stdbool.h>
#include "inc/hw_types.h"
#include "inc/hw_memmap.h"
#include "driverlib/sysctl.h"
#include "driverlib/gpio.h"

int main(void)
{
    uint8_t ui8LED = 2;
```

```

        SysCtlClockSet(SYSCTL_SYSDIV_33|SYSCTL_USE_PLL|SYSCTL_XTAL_16MHZ|SYSCTL_OSC_MA
IN); //set the clock to be 40 MHz
        //Set clock to 6 MHz => 400MHz / (33*2) = 6MHz
        SysCtlPeripheralEnable(SYSCTL_PERIPH_GPIOF); //Enable the GPIO PORTF pins
        GPIOPinTypeGPIOOutput(GPIO_PORTF_BASE, GPIO_PIN_1|GPIO_PIN_2|GPIO_PIN_3);
        //Set pin 1, 2,3 at PORT F at outputs
        while(1)
        {
            // Turn on the LED
            GPIOPinWrite(GPIO_PORTF_BASE, GPIO_PIN_1|GPIO_PIN_2|GPIO_PIN_3, ui8LED);
            // Delay for a bit
            SysCtlDelay(2000000); //Sets a delay of 2000000 clock ticks
            // Cycle through Red, Green and Blue LEDs
            if (ui8LED == 8) {ui8LED = 2;} else {ui8LED = ui8LED*2;}
        }
}

```

### Task 3a

//This program will blink the LEDs in a different sequence and will light more than one at a time  
//The base 50 ms delay will be used

```

#include <stdint.h>
#include <stdbool.h>
#include "inc/hw_types.h"
#include "inc/hw_memmap.h"
#include "driverlib/sysctl.h"
#include "driverlib/gpio.h"

int main(void)
{
    uint8_t ui8LED = 8;
    SysCtlClockSet(SYSCTL_SYSDIV_33|SYSCTL_USE_PLL|SYSCTL_XTAL_16MHZ|SYSCTL_OSC_MA
IN); //set the clock to be 40 MHz
    //Set clock to 6 MHz => 400MHz / (33*2) = 6MHz
    SysCtlPeripheralEnable(SYSCTL_PERIPH_GPIOF); //Enable the GPIO PORTF pins
    GPIOPinTypeGPIOOutput(GPIO_PORTF_BASE, GPIO_PIN_1|GPIO_PIN_2|GPIO_PIN_3);
    //Set pin 1, 2,3 at PORT F at outputs
    while(1)
    {
        // Turn on the LED
        GPIOPinWrite(GPIO_PORTF_BASE, GPIO_PIN_1|GPIO_PIN_2|GPIO_PIN_3, ui8LED);
        // Delay for a bit
        SysCtlDelay(2000000);
        // Cycle through Red, Green and Blue LEDs
        if (ui8LED == 2) {ui8LED = 8;} else {ui8LED = ui8LED/2;}
    }
}

```

### Task 3b

//This program will blink the LEDs in a different sequence and will light more than one at a time

//The base 50 ms delay will be used

```
#include <stdint.h>
#include <stdbool.h>
#include "inc/hw_types.h"
#include "inc/hw_memmap.h"
#include "driverlib/sysctl.h"
#include "driverlib/gpio.h"

int main(void)
{
    uint8_t ui8LED = 0; //output pin data
    uint8_t colorValues[3] = { 6, 12, 10 }; //array to hold the pattern of the
output values
    int i = 0; //index of the array
    SysCtlClockSet(SYSCTL_SYSDIV_33|SYSCTL_USE_PLL|SYSCTL_XTAL_16MHZ|SYSCTL_OSC_MA
IN); //set the clock to be 40 MHz
    //Set clock to 6 MHz => 400MHz / (33*2) = 6MHz
    SysCtlPeripheralEnable(SYSCTL_PERIPH_GPIOF); //Enable the GPIO PORTF pins
    GPIOPinTypeGPIOOutput(GPIO_PORTF_BASE, GPIO_PIN_1|GPIO_PIN_2|GPIO_PIN_3);
    //Set pin 1, 2,3 at PORT F at outputs
    while(1)
    {
        for (i = 0; i < 3; i++)
        {
            ui8LED = colorValues[i]; //Assign the value of the pin to output
            // Turn on the LED
            GPIOPinWrite(GPIO_PORTF_BASE, GPIO_PIN_1|GPIO_PIN_2|GPIO_PIN_3,
ui8LED);
            // Delay for a bit
            SysCtlDelay(2000000);
        }
        i = 0;
    }
}
```