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CpE 403

Lab 3

**Task 00:**

// The purpose of task 00 was to execute the provided code and have the Tiva C board’s LED

// alternate between red, blue, and green.

**#include** <stdint.h>

**#include** <stdbool.h>

**#include** "inc/hw\_memmap.h"

**#include** "inc/hw\_types.h"

**#include** "driverlib/sysctl.h"

**#include** "driverlib/gpio.h"

uint8\_t ui8PinData=2;

**int** **main**(**void**)

{

**SysCtlClockSet**(SYSCTL\_SYSDIV\_5|SYSCTL\_USE\_PLL|SYSCTL\_XTAL\_16MHZ|SYSCTL\_OSC\_MAIN);

**SysCtlPeripheralEnable**(SYSCTL\_PERIPH\_GPIOF);

**GPIOPinTypeGPIOOutput**(GPIO\_PORTF\_BASE, GPIO\_PIN\_1|GPIO\_PIN\_2|GPIO\_PIN\_3);

**while**(1)

{

**GPIOPinWrite**(GPIO\_PORTF\_BASE, GPIO\_PIN\_1| GPIO\_PIN\_2| GPIO\_PIN\_3, ui8PinData);

**SysCtlDelay**(2000000);

**GPIOPinWrite**(GPIO\_PORTF\_BASE, GPIO\_PIN\_1|GPIO\_PIN\_2|GPIO\_PIN\_3, 0x00);

**SysCtlDelay**(2000000);

**if**(ui8PinData==8) {ui8PinData=2;} **else** {ui8PinData=ui8PinData\*2;}

}

}

**Task 01:**

**//** The current period and on-time of the LED blinking is determined by:

// 40 MHz = 25 ns \* 5 = 125 ns

// 125ns \* 2000000 gives us the delay of .25 s.

// In the while loop there are a total of two delays resulting in .50s per color and since there are //three colors the **period it takes for the LED to blink in all three colors is 1.5s.**

//The LED is on half of the period and off the other half so the **on-time of the LED is .75s.**

**#include** <stdint.h>

**#include** <stdbool.h>

**#include** "inc/hw\_memmap.h"

**#include** "inc/hw\_types.h"

**#include** "driverlib/sysctl.h"

**#include** "driverlib/gpio.h"

uint8\_t ui8PinData=2;

**int** **main**(**void**)

{

**SysCtlClockSet**(SYSCTL\_SYSDIV\_7|SYSCTL\_USE\_PLL|SYSCTL\_XTAL\_16MHZ|SYSCTL\_OSC\_MAIN);

// 400MHz / (7\*2) = 28.6 MHz

// 28.6 MHz = 25ns \* 7 = 175 ns

**SysCtlPeripheralEnable**(SYSCTL\_PERIPH\_GPIOF);

**GPIOPinTypeGPIOOutput**(GPIO\_PORTF\_BASE, GPIO\_PIN\_1|GPIO\_PIN\_2|GPIO\_PIN\_3);

**while**(1)

{

**GPIOPinWrite**(GPIO\_PORTF\_BASE, GPIO\_PIN\_1| GPIO\_PIN\_2| GPIO\_PIN\_3, ui8PinData);

**SysCtlDelay**(2000000);

// 175 ns \* 2000000 = 0.35s

// At a CLK frequency of 28.6 MHz we have a delay of 0.35s which is // approximate to the desire // .333 seconds.

**GPIOPinWrite**(GPIO\_PORTF\_BASE, GPIO\_PIN\_1|GPIO\_PIN\_2|GPIO\_PIN\_3, 0x00);

**SysCtlDelay**(2000000);

**if**(ui8PinData==8) {ui8PinData=2;} **else** {ui8PinData=ui8PinData\*2;}

}

}

**Task 02(a):**

// Change the sequence of LED blinking. I will begin by setting ui8PinData = 8, which will set

// my first color to green. Then I will change the if statement at the end of the while loop so my

// sequence goes Green, Blue, Red instead of Red, Green, Blue.

**#include** <stdint.h>

**#include** <stdbool.h>

**#include** "inc/hw\_memmap.h"

**#include** "inc/hw\_types.h"

**#include** "driverlib/sysctl.h"

**#include** "driverlib/gpio.h"

uint8\_t ui8PinData=8;

**int** **main**(**void**)

{

**SysCtlClockSet**(SYSCTL\_SYSDIV\_7|SYSCTL\_USE\_PLL|SYSCTL\_XTAL\_16MHZ|SYSCTL\_OSC\_MAIN);

**SysCtlPeripheralEnable**(SYSCTL\_PERIPH\_GPIOF);

**GPIOPinTypeGPIOOutput**(GPIO\_PORTF\_BASE, GPIO\_PIN\_1|GPIO\_PIN\_2|GPIO\_PIN\_3);

**while**(1)

{

**GPIOPinWrite**(GPIO\_PORTF\_BASE, GPIO\_PIN\_1| GPIO\_PIN\_2| GPIO\_PIN\_3, ui8PinData);

**SysCtlDelay**(2000000);

**GPIOPinWrite**(GPIO\_PORTF\_BASE, GPIO\_PIN\_1|GPIO\_PIN\_2|GPIO\_PIN\_3, 0x00);

**SysCtlDelay**(2000000);

**if**(ui8PinData==2) {ui8PinData=8;} **else** {ui8PinData=ui8PinData/2;}

}

}

**Task 02(b):**

// Blink two LED at and instance and with a sequence.

**#include** <stdint.h>

**#include** <stdbool.h>

**#include** "inc/hw\_memmap.h"

**#include** "inc/hw\_types.h"

**#include** "driverlib/sysctl.h"

**#include** "driverlib/gpio.h"

uint8\_t ui8PinData=6; // two LED's on simultaneously

**int** **main**(**void**)

{

**SysCtlClockSet**(SYSCTL\_SYSDIV\_7|SYSCTL\_USE\_PLL|SYSCTL\_XTAL\_16MHZ|SYSCTL\_OSC\_MAIN);

**SysCtlPeripheralEnable**(SYSCTL\_PERIPH\_GPIOF);

**GPIOPinTypeGPIOOutput**(GPIO\_PORTF\_BASE, GPIO\_PIN\_1|GPIO\_PIN\_2|GPIO\_PIN\_3);

**while**(1)

{

**GPIOPinWrite**(GPIO\_PORTF\_BASE, GPIO\_PIN\_1| GPIO\_PIN\_2| GPIO\_PIN\_3, ui8PinData);

**SysCtlDelay**(2000000);

**GPIOPinWrite**(GPIO\_PORTF\_BASE, GPIO\_PIN\_1|GPIO\_PIN\_2|GPIO\_PIN\_3, 0x00);

**SysCtlDelay**(2000000);

**if**(ui8PinData==6) {ui8PinData=10;}

**else** **if**(ui8PinData==10) {ui8PinData=12;}

**else** {ui8PinData=6;}

}

}