**GPIO Lab**

**Videos and image with the following names are found in Dropbox:**

**Task 1 - Lab03-T01.png**

**Task 2 - Lab03-T02.mov**

**Task 3 - Lab03-T03.mov**

**Task 1: Adding comments to original code**

#include <stdint.h>

#include <stdbool.h>

#include "inc/hw\_memmap.h" //memory map definition for Tiva C device

#include "inc/hw\_types.h" //defines common types and macros

#include "driverlib/sysctl.h" //defines macros for System Control API of DriverLib

#include "driverlib/gpio.h" //defines macros fro GPIO API of DriverLib

uint8\_t ui8PinData=2; //unsigned 8-bit integer to store sequence for LEDs

int main(void)

{

SysCtlClockSet(SYSCTL\_SYSDIV\_5|SYSCTL\_USE\_PLL|SYSCTL\_XTAL\_16MHZ|SYSCTL\_OSC\_MAIN); //set clock: use PLL with 16MHz xtal, and divide by 5

SysCtlPeripheralEnable(SYSCTL\_PERIPH\_GPIOF); //enable port F

GPIOPinTypeGPIOOutput(GPIO\_PORTF\_BASE, GPIO\_PIN\_1|GPIO\_PIN\_2|GPIO\_PIN\_3); //set output pins on port F for the LEDs

while(1)

{

GPIOPinWrite(GPIO\_PORTF\_BASE, GPIO\_PIN\_1|GPIO\_PIN\_2|GPIO\_PIN\_3, ui8PinData); //turn on next LED sequence

SysCtlDelay(2000000); //delay for 2000000 cycles

GPIOPinWrite(GPIO\_PORTF\_BASE, GPIO\_PIN\_1|GPIO\_PIN\_2|GPIO\_PIN\_3, 0x00); //turn all LEDs off

SysCtlDelay(2000000); //delay for 2000000 cycles

if(ui8PinData==8) {ui8PinData=2;} else {ui8PinData=ui8PinData\*2;} //sequence will be 0010, 0100, 1000, 0010 ...

}

}

**Task 2: Changing clock so LED is on for 0.5 seconds and off for 0.5 seconds**

#include <stdint.h>

#include <stdbool.h>

#include "inc/hw\_memmap.h" //memory map definition for Tiva C device

#include "inc/hw\_types.h" //defines common types and macros

#include "driverlib/sysctl.h" //defines macros for System Control API of DriverLib

#include "driverlib/gpio.h" //defines macros fro GPIO API of DriverLib

uint8\_t ui8PinData=2; //unsigned 8-bit integer to store sequence for LEDs

int main(void)

{

SysCtlClockSet(SYSCTL\_SYSDIV\_1|SYSCTL\_USE\_PLL|SYSCTL\_XTAL\_16MHZ|SYSCTL\_OSC\_MAIN); //set clock so LED is on for 0.5 seconds and off for 0.5 seconds.

SysCtlPeripheralEnable(SYSCTL\_PERIPH\_GPIOF); //enable port F

GPIOPinTypeGPIOOutput(GPIO\_PORTF\_BASE, GPIO\_PIN\_1|GPIO\_PIN\_2|GPIO\_PIN\_3 | GPIO\_PIN\_4);//set output pins on port F for the LEDs

while(1)

{

// This section uses one pin as output (F4) to verify the clock is 0.5 seconds

GPIOPinWrite(GPIO\_PORTF\_BASE, GPIO\_PIN\_4, 0xFF); //turn on next LED sequence

SysCtlDelay(2000000); //delay for 2000000 cycles

GPIOPinWrite(GPIO\_PORTF\_BASE, GPIO\_PIN\_4, 0x00); //turn all LEDs off

SysCtlDelay(2000000); //delay for 2000000 cycles

// Commented out because we only care about setting the clock in this task

// GPIOPinWrite(GPIO\_PORTF\_BASE, GPIO\_PIN\_1|GPIO\_PIN\_2|GPIO\_PIN\_3, ui8PinData); //turn // on next LED sequence

// SysCtlDelay(2000000); //delay for 2000000 cycles

// GPIOPinWrite(GPIO\_PORTF\_BASE, GPIO\_PIN\_1|GPIO\_PIN\_2|GPIO\_PIN\_3, 0x00); //turn all // LEDs off

// SysCtlDelay(2000000); //delay for 2000000 cycles

//

// if(ui8PinData==8) {ui8PinData=2;} else {ui8PinData=ui8PinData\*2;} // sequence will be 0010, 0100, 1000, 0010 ...

}

}

**Task 3: Changing the sequence of the LEDs/ Blinking two LEDs with a sequence**

#include <stdint.h>

#include <stdbool.h>

#include "inc/hw\_memmap.h" //memory map definition for Tiva C device

#include "inc/hw\_types.h" //defines common types and macros

#include "driverlib/sysctl.h" //defines macros for System Control API of DriverLib

#include "driverlib/gpio.h" //defines macros fro GPIO API of DriverLib

uint8\_t ui8PinData=6; //unsigned 8-bit integer to store sequence for LEDs

int main(void)

{

SysCtlClockSet(SYSCTL\_SYSDIV\_1|SYSCTL\_USE\_PLL|SYSCTL\_XTAL\_16MHZ|SYSCTL\_OSC\_MAIN); //set clock:

SysCtlPeripheralEnable(SYSCTL\_PERIPH\_GPIOF); //enable port F

GPIOPinTypeGPIOOutput(GPIO\_PORTF\_BASE, GPIO\_PIN\_1|GPIO\_PIN\_2|GPIO\_PIN\_3|GPIO\_PIN\_4); //set output pins on port F for the LEDs

while(1)

{

GPIOPinWrite(GPIO\_PORTF\_BASE, GPIO\_PIN\_1|GPIO\_PIN\_2|GPIO\_PIN\_3|GPIO\_PIN\_4, ui8PinData); //turn on next LED sequence

SysCtlDelay(2000000); //delay for 2000000 cycles

GPIOPinWrite(GPIO\_PORTF\_BASE, GPIO\_PIN\_1|GPIO\_PIN\_2|GPIO\_PIN\_3|GPIO\_PIN\_4, 0x00); //turn all LEDs off

SysCtlDelay(2000000); //delay for 2000000 cycles

if(ui8PinData==24) {ui8PinData=6;} else {ui8PinData=ui8PinData\*2;} //sequence will be 00110, 01100, 11000, 00110 ...

}

}