TivaC Lab 3 - GPIO

CPE 403

**Checklist for Lab 3**

* A text/word document of the initial code with comments
* In the document, for each task submit the modified or included code (only) with highlights and justifications of the modifications. Also include the comments.
* Provide a permanent link to all main and dependent source code files only (name them as LabXX-TYY, XX-Lab# and YY-task#)Screenshots of debugging process along with pictures of actual circuit
* Video link of demonstration.

**Code for Experiment**

**Task 1:**

**#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**() {

// Set to use 16MHz clock divided by 5. Use PLL. with main oscillator is used.

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

// Enable the peripheral for GPIO at port F.

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

// Set the pins 1 through 3 at port F as outputs.

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

**while**( 1 )

{

// Write enable the value of the mask of ui8PinData to the pins 1 - 3.

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

// Delay of 2M loop cycles.

**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 2:**

**#include** <stdint.h>

**#include** <stdbool.h>

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

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

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

uint8\_t ui8pinData[]={2, 4, 8, 6, 10, 12};

uint8\_t count = 0;

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

{

// Set clock at 16MHz with

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

// Enable Port F

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

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

// Set GPIO Pins

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

**GPIOPinTypeGPIOInput**(GPIO\_PORTD\_BASE, GPIO\_PIN\_1);

**while**(1)

{

**while**(!**GPIOPinRead**(GPIO\_PORTD\_BASE, GPIO\_PIN\_1)){

count = 0;

}

**while**(**GPIOPinRead**(GPIO\_PORTD\_BASE, GPIO\_PIN\_1))

{

// Write Pins High

**GPIOPinWrite**(GPIO\_PORTF\_BASE, GPIO\_PIN\_1|GPIO\_PIN\_2|GPIO\_PIN\_3, ui8pinData[count]);

**SysCtlDelay**(2000000);

// Update Sequence of Pins

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

**SysCtlDelay**(2000000);

count++;

**if**(count == 6)

count = 0;

// if(ui8pinData==8) {

// ui8pinData=2;

// }

// else {

// ui8pinData=ui8pinData\*2;

// }

}

}

**Task 3:**

**#include** <stdint.h>

**#include** <stdbool.h>

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

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

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

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

// Part (a) of task 3: Change sequence. Sequence was reversed.

// uint8\_t ui8PinData = 8; // For changing sequence of LED blinking.

// Part (b) of task 3: Blink two LEDs at a time.

uint8\_t ui8PinData = 6; // For changing sequence of LED blinking.

**int** **main**() {

// Set to use 16MHz clock divided by 5. Use PLL. with main oscillator is used.

**SysCtlClockSet**(

SYSCTL\_SYSDIV\_10 | SYSCTL\_USE\_PLL | SYSCTL\_XTAL\_16MHZ

| SYSCTL\_OSC\_MAIN);

// Enable the peripheral for GPIO at port F.

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

// Set the pins 1 through 3 at port F as outputs.

**GPIOPinTypeGPIOOutput**(GPIO\_PORTF\_BASE,

GPIO\_PIN\_1 | GPIO\_PIN\_2 | GPIO\_PIN\_3);

//clock = SysCtlClockGet();

**while** (1) {

// Write enable the value of the mask of ui8PinData to the pins 1 - 3.

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

ui8PinData);

// Delay of 2M loop cycles.

**SysCtlDelay**(2000000);

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

0x00);

**SysCtlDelay**(2000000);

// Part (a) of task 3: Change sequence. Sequence was reversed.

// if (ui8PinData == 2) ui8PinData = 8; else ui8PinData = ui8PinData / 2;

// Part (b) of task 3: Blink two LEDs at a time.

**if** (ui8PinData == 12)

ui8PinData = 6;

**else** **if** (ui8PinData == 10)

ui8PinData = ui8PinData + 2;

**else**

ui8PinData = ui8PinData + 4;

}

}

**Video Link to Demo**

[**Task**](https://www.youtube.com/watch?v=6Nrp7cJtleM) **2:** [**https://www.youtube.com/watch?v=52SrBOkpplY**](https://www.youtube.com/watch?v=52SrBOkpplY)

[**Task**](https://www.youtube.com/watch?v=6Nrp7cJtleM) **3:** [**https://www.youtube.com/watch?v=QyYhrPlrXe4**](https://www.youtube.com/watch?v=QyYhrPlrXe4)