LAB NO : 6 DATE : 12/02/2025

Title : INTERFACING LED TO ARM MICROCONTROLLER

# Lab Exercise 1: Write C program to display an 8-bit binary up counter on the LEDs.

## Code :

#include <LPC17xx.h>

//Declaration outside main function

unsigned int counter = 0, i;

int main(void){

SystemInit();

SystemCoreClockUpdate();

//Configuring port0 pins p0.4 to p0.11 as GPIO

LPC\_PINCON->PINSEL0 &= 0xFF0000FF;

//Configure p0.4 to p0.11 as output

LPC\_GPIO0->FIODIR |= 0x00000FF0;

while(1){

//Clearing all LEDs

LPC\_GPIO0->FIOCLR = 0x00000FF0;

//Setting LEDs based on counter

LPC\_GPIO0->FIOSET = (counter<<4);

for (i=0; i<100000; i++); //delay

//Incrementing up counter variable

counter++;

if (counter>0xFF) //Stopping once Highest value reached

break;

}

}

# Lab Exercise 2: Write C program to read a key and display an 8-bit binary up/down counter on the LEDs. Hint : use key sw2 (CNB pin 7)

## Code :

#include <LPC17xx.h>

//Declaration outside everything

unsigned int counter = 1, i, switchState=1, flag = 1;

int main(void){

SystemInit();

SystemCoreClockUpdate();

//For LEDs

//Configuring port0 pins p0.4 to p0.11 as GPIO

LPC\_PINCON->PINSEL0 &= 0xFF0000FF;

//Configure p0.4 to p0.11 as output

LPC\_GPIO0->FIODIR |= 0x00000FF0;

//For Key

// Configuring port2 pin p0.7 as GPIO

LPC\_PINCON->PINSEL4 &= 0xFCFFFFFF;

LPC\_GPIO2->FIODIR &= ~(1<<12);//0x00001000;

while(1){

//Reading current state of switch

switchState = (LPC\_GPIO2->FIOPIN >> 12) & 1;

if (switchState == 0){

flag = !flag; //Switching between up and down counter

if (flag) counter = 0; //Resetting counter

else counter = 255;

}

//Up and down counter logic

if (flag)

counter++;

else counter--;

//Clearing all LEDs

LPC\_GPIO0->FIOCLR = 0x00000FF0;

//Setting required LEDs

LPC\_GPIO0->FIOSET = (counter<<4); // <<4 as port 0,1,2,3 are not being used

for (i=0; i<100000; i++); //delay

if (counter>0xFF || counter==0)

break;

}

}

# Lab Exercise 3: Write a C program to simulate an 8-bit ring counter with key press (SW2).

## Code :

#include <LPC17xx.h>

//Declaration outside everything

unsigned int counter = 1, i, switchState=1, flag = 1;

int main(void){

SystemInit();

SystemCoreClockUpdate();

//For LEDs

//Configuring port0 pins p0.4 to p0.11 as GPIO

LPC\_PINCON->PINSEL0 &= 0xFF0000FF;

//Configure p0.4 to p0.11 as output

LPC\_GPIO0->FIODIR |= 0x00000FF0;

//For Key

// Configuring port2 pin p0.7 as GPIO

LPC\_PINCON->PINSEL4 &= 0xFCFFFFFF;

LPC\_GPIO2->FIODIR &= ~(1<<12);//0x00001000

while(1){

//Reading current state of switch

switchState = (LPC\_GPIO2->FIOPIN >> 12) & 1;

if (switchState == 0) //If pressed

counter <<= 1; //Increment ring counter -> left shift variable

//Clearing all LEDs

LPC\_GPIO0->FIOCLR = 0x00000FF0;

//Setting required LEDs

LPC\_GPIO0->FIOSET = (counter<<4); //Not using port 0 to 3

for (i=0; i<100000; i++); //delay

if (counter >= (1<<8)) //Resetting Ring counter

counter = 1;

}

}