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**سكشن : 2**

**قسم هندسة الحاسبات ونظم التحكم**

**Lab 8 – Task**

**Power Optimized Display**

**……………………………………….**

**Screenshot of the circuit**

**A screenshot of a computer

Description automatically generated**

**Code:**

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**\* File: main.c**

**\* Author: engay**

**\***

**\* Created on May 10, 2024, 1:15 AM**

**\*/**

**#include <xc.h>**

**#include "common.h"**

**#include "lcd.h"**

**#include "timer.h"**

**extern unsigned long timer0\_time\_passed\_ms;**

**extern unsigned short overflow\_cnt;**

**#define WakeUp\_Button PORTBbits.RB0**

**#define Up\_Button PORTBbits.RB5**

**#define Down\_Button PORTBbits.RB6**

**#define Reset\_Button PORTBbits.RB7**

**#define ON 0**

**#define OFF 1**

**#define Sleep\_Mode\_Time 4000**

**void My\_init\_Function()**

**{**

**lcd\_init();**

**timer0\_init(\_TIMER\_PRESCALER\_2);**

**lcd\_cmd(\_LCD\_CLEAR);**

**OPTION\_REGbits.nRBPU = 0;**

**INTE = 1;**

**INTF = 0;**

**INTEDG= 1;**

**TRISB=0xff;**

**GIE=1;**

**}**

**void Print(int mynum)**

**{**

**char My\_Buffer[9];**

**sprintf(My\_Buffer,"%d",mynum);**

**lcd\_out\_cp(My\_Buffer);**

**}**

**void \_\_interrupt() ISR()**

**{**

**GIE = 0;**

**if(INTE == 1 && INTF == 1)**

**{**

**// My\_Implementaion here**

**timer0\_time\_passed\_ms = 0 ; // Reset My Timer To start calcualte from zero.**

**INTF = 0;**

**GIE = 1;**

**return;**

**}**

**if(TMR0IF==1 && TMR0IE==1)**

**{**

**overflow\_cnt++;**

**if(overflow\_cnt==4)**

**{**

**timer0\_time\_passed\_ms++;**

**overflow\_cnt = 0;**

**}**

**TMR0IF=0;**

**}**

**TMR0= 6+40;**

**GIE=1;**

**}**

**void my\_delay(unsigned long mytime)**

**{**

**unsigned long start\_time=0,end\_time=0;**

**end\_time = timer\_get\_time\_since\_init();**

**while(end\_time-start\_time<=mytime)**

**{**

**end\_time = timer\_get\_time\_since\_init();**

**}**

**timer0\_time\_passed\_ms=0;**

**}**

**void main(void) {**

**My\_init\_Function();**

**int count = 0;**

**lcd\_out(1,1," WELCOME USER");**

**my\_delay(3000);**

**lcd\_cmd(\_LCD\_CLEAR);**

**unsigned long start\_time=0,end\_time=0;**

**while(1)**

**{**

**if(end\_time-start\_time<=Sleep\_Mode\_Time)**

**{**

**lcd\_out(1,1,"Count = ");**

**//lcd\_chr\_cp(count+48); // Make it good.**

**Print(count);**

**if(Up\_Button == ON)**

**{**

**count++;**

**timer0\_time\_passed\_ms=0;**

**while(Up\_Button == ON);**

**lcd\_cmd(\_LCD\_CLEAR);**

**}**

**if(Down\_Button == ON)**

**{**

**if(count!=0)**

**{**

**count--;**

**}**

**timer0\_time\_passed\_ms=0;**

**while(Down\_Button == ON);**

**lcd\_cmd(\_LCD\_CLEAR);**

**}**

**if(Reset\_Button == ON)**

**{**

**count = 0;**

**timer0\_time\_passed\_ms=0;**

**while(Reset\_Button == ON);**

**lcd\_cmd(\_LCD\_CLEAR);**

**}**

**}**

**else**

**{**

**lcd\_cmd(\_LCD\_CLEAR);**

**while(end\_time-start\_time>Sleep\_Mode\_Time)**

**{**

**end\_time = timer0\_time\_passed\_ms ;**

**}**

**lcd\_out(1,1,"Wake up Ayman");**

**my\_delay(2000);**

**timer0\_time\_passed\_ms = 0 ;**

**lcd\_cmd(\_LCD\_CLEAR);**

**}**

**end\_time = timer\_get\_time\_since\_init();**

**}**

**return;**

**}**