Lab 10

Interfacing an external LCD to the MSP430 Microcontroller and Onboard LCD

Spring 2025

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Class Section: A

"On my honor, as student of University of Engineering and Technology, I have neither given nor received unauthorized assistance on this academic work."

Mohsin Sajjad

Student Signature: _____

Submitted to:

Engr. Faheem Jan

Month Day, Year (18 05, 2025)

Department of Computer Systems Engineering

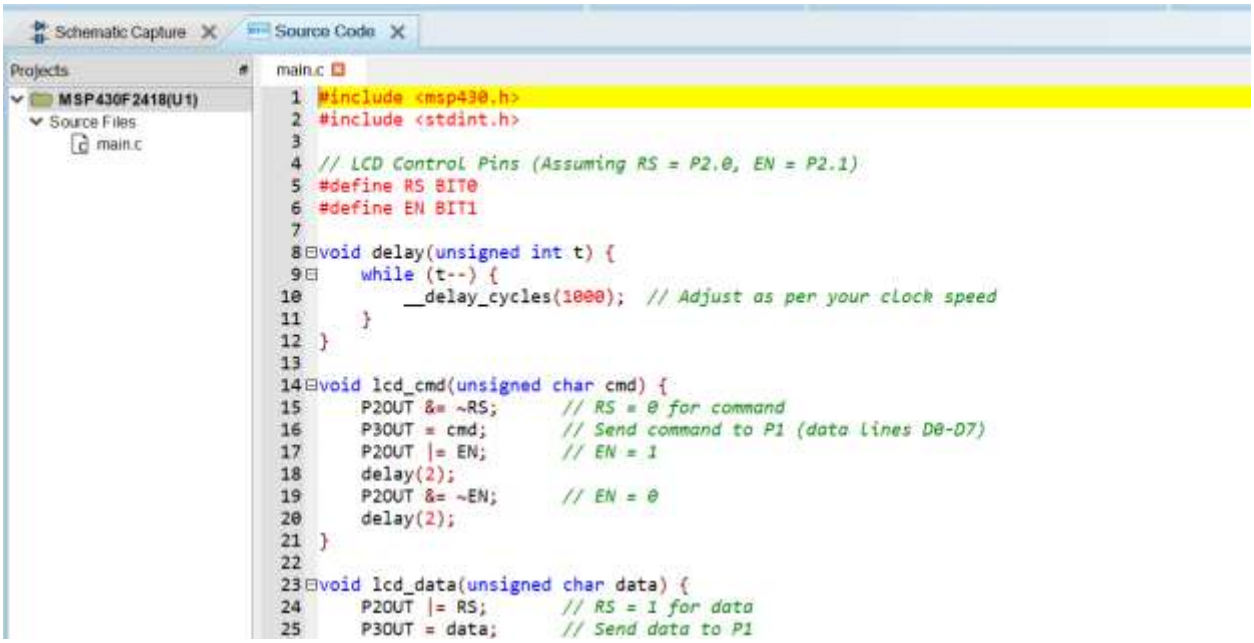
University of Engineering and Technology, Peshawar

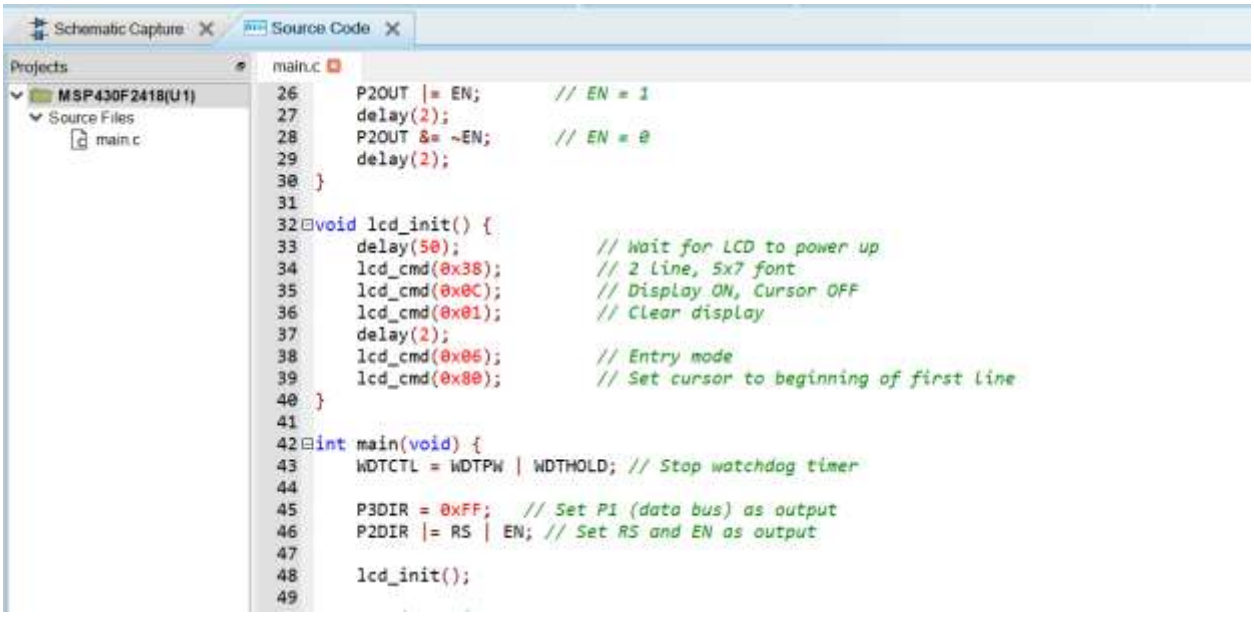
Interfacing an external LCD to the MSP430 Microcontroller and Onboard LCD

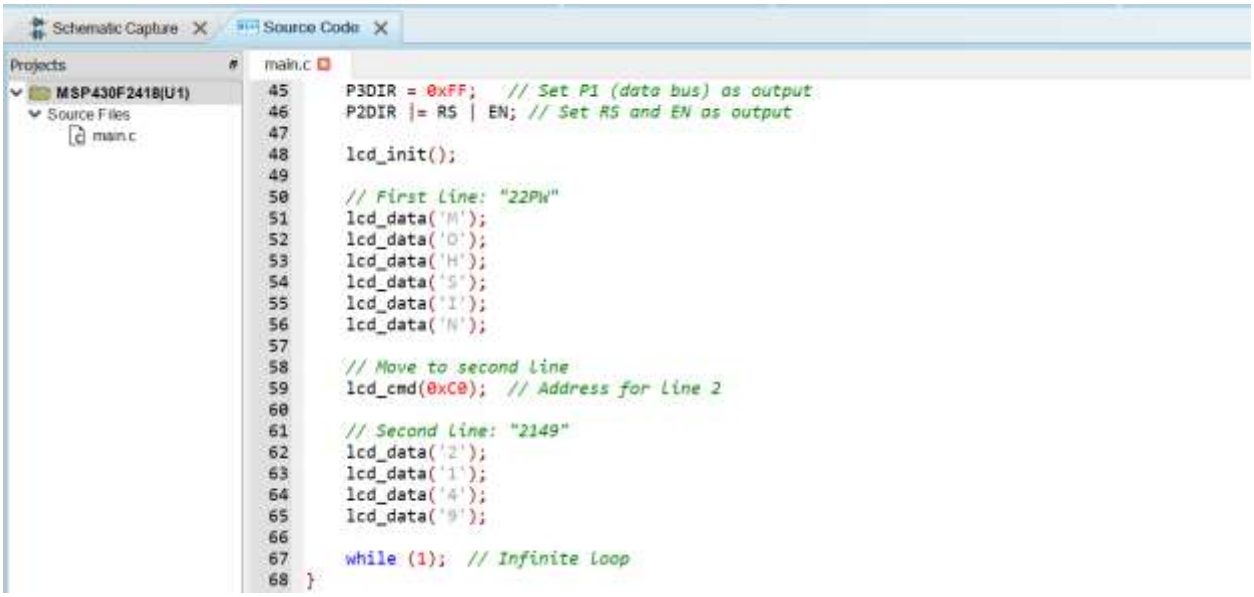
TASKS:

1) Write Your Name on First Line and registration Number on second line of LCD (use proteus or attach external LCD with MSP).

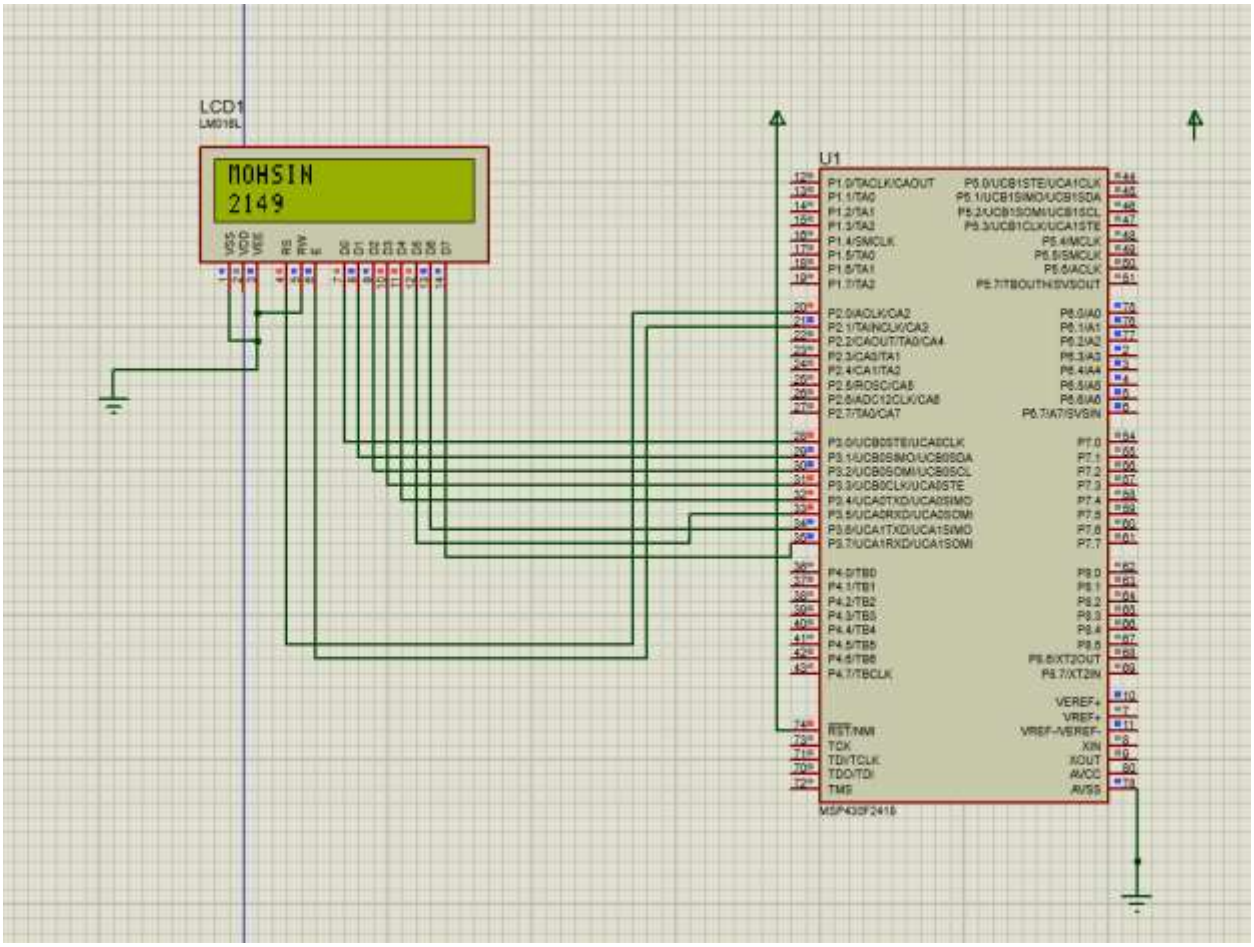
CODE:






Schematic Capture
Source Code
Projects
MSP430F2418(U1)
Source Files
main.c
main.c
45 P3DIR = 0xFF; // Set P1 (data bus) as output
46 P2DIR |= RS | EN; // Set RS and EN as output
47
48 lcd_init();
49
50 // First line: "22PW"
51 lcd_data('M');
52 lcd_data('O');
53 lcd_data('H');
54 lcd_data('S');
55 lcd_data('I');
56 lcd_data('N');
57
58 // Move to second line
59 lcd_cmd(0xC0); // Address for line 2
60
61 // Second line: "2149"
62 lcd_data('2');
63 lcd_data('1');
64 lcd_data('4');
65 lcd_data('9');
66
67 while (1); // Infinite loop
68 }

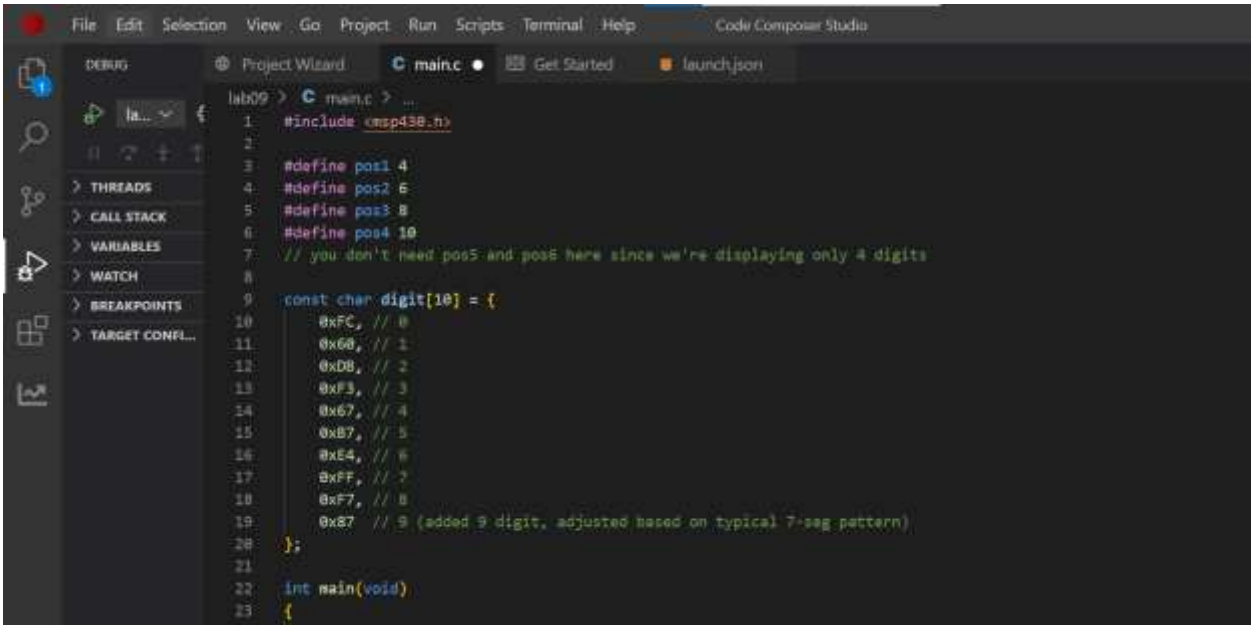
OUTPUT:


LCD1
LM016L
MOHSIN
2149
U1
MSP430F2418

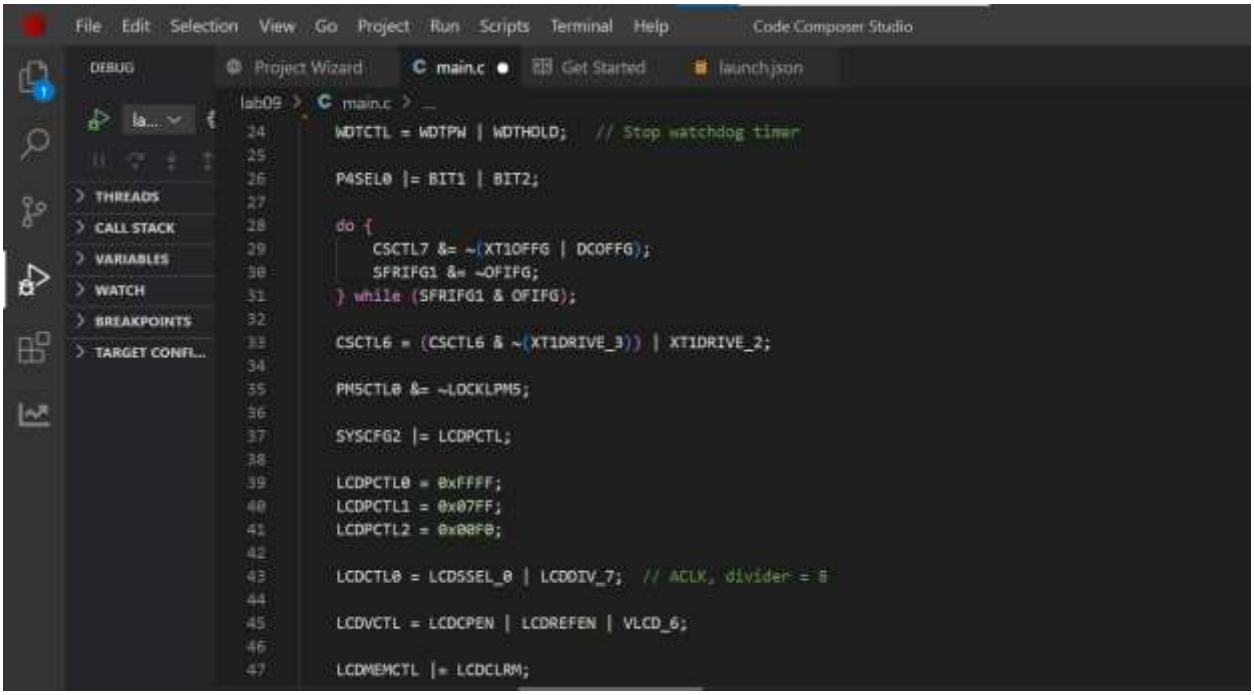
Task 2:

CODE:

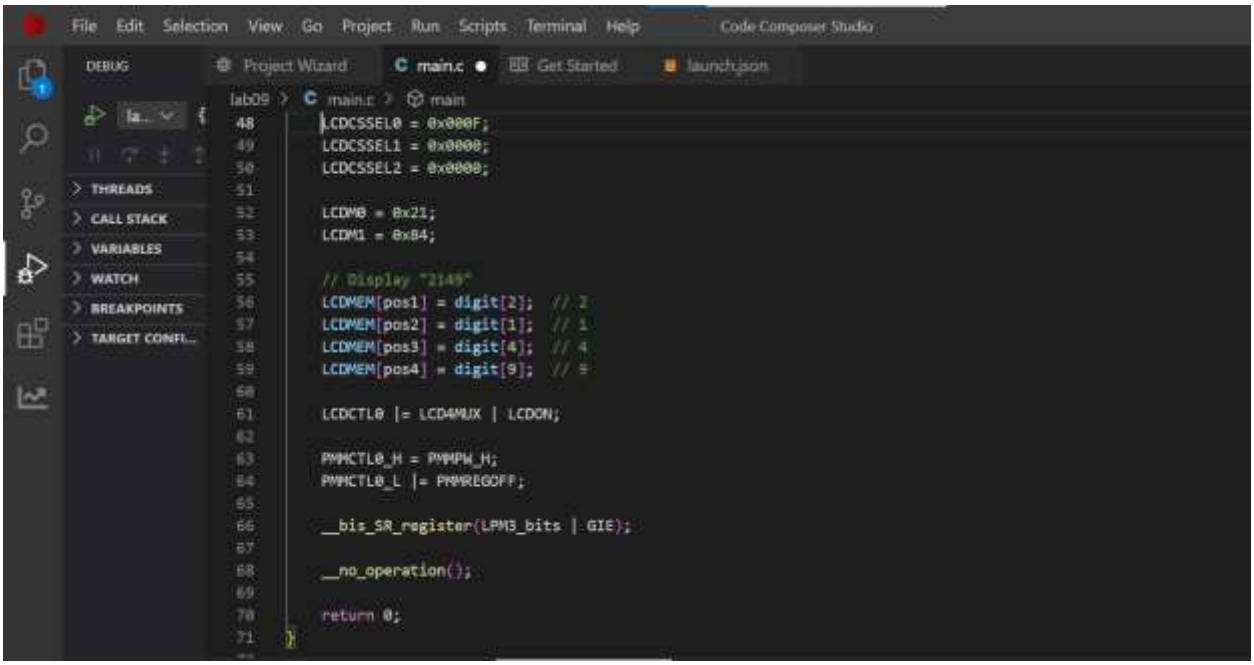
Write last four digit of your registration Number On the Onboard LCD of msp430fr4133.



```c
#include <msp430.h>

#define pos1 4
#define pos2 6
#define pos3 8
#define pos4 10
// you don't need pos5 and pos6 here since we're displaying only 4 digits

const char digit[10] = {
    0xFC, // 0
    0x60, // 1
    0xDB, // 2
    0xF3, // 3
    0x67, // 4
    0xB7, // 5
    0xE4, // 6
    0xFF, // 7
    0xF7, // 8
    0x87  // 9 (added 9 digit, adjusted based on typical 7-seg pattern)
};

int main(void)
{
```



```c
    WDTCTL = WDTPW | WDTHOLD;   // Stop watchdog timer

    P4SEL0 |= BIT1 | BIT2;

    do {
        CSCTL7 &= ~(XT1OFFG | DCOFFG);
        SFRIFG1 &= ~OFIFG;
    } while (SFRIFG1 & OFIFG);

    CSCTL6 = (CSCTL6 & ~(XT1DRIVE_3)) | XT1DRIVE_2;

    PM5CTL0 &= ~LOCKLPM5;

    SYSCFG2 |= LCDPCTL;

    LCDPCTL0 = 0xFFFF;
    LCDPCTL1 = 0x07FF;
    LCDPCTL2 = 0x00F0;

    LCDCTL0 = LCDSSEL_0 | LCDDIV_7;  // ACLK, divider = 8

    LCDVCTL = LCDCPEN | LCDREFEN | VLCD_6;

    LCDMEMCTL |= LCDCLRM;
```


File Edit Selection View Go Project Run Scripts Terminal Help
Code Composer Studio
DEBUG
Project Wizard
main.c
Get Started
launch.json
lab09 > main.c > main
THREADS
CALL STACK
VARIABLES
WATCH
BREAKPOINTS
TARGET CONFI...
48 LCDCSSEL0 = 0x000F;
49 LCDCSSEL1 = 0x0000;
50 LCDCSSEL2 = 0x0000;
51
52 LCDM8 = 0x21;
53 LCDM1 = 0x84;
54
55 // Display "2149"
56 LCDMEM[pos1] = digit[2]; // 2
57 LCDMEM[pos2] = digit[1]; // 1
58 LCDMEM[pos3] = digit[4]; // 4
59 LCDMEM[pos4] = digit[9]; // 9
60
61 LCDCTL0 |= LCD4MUX | LCDON;
62
63 PMMCTL0_H = PMMPW_H;
64 PMMCTL0_L |= PMMREGOFF;
65
66 __bis_SR_register(LPM3_bits | GIE);
67
68 __no_operation();
69
70 return 0;
71 }