اسم الطالب : أيمن محمد نبيل محمد

سكشن : 2

قسم هندسة الحاسبات ونظم التحكم

Lab 5 – Task

Embedded Random Number

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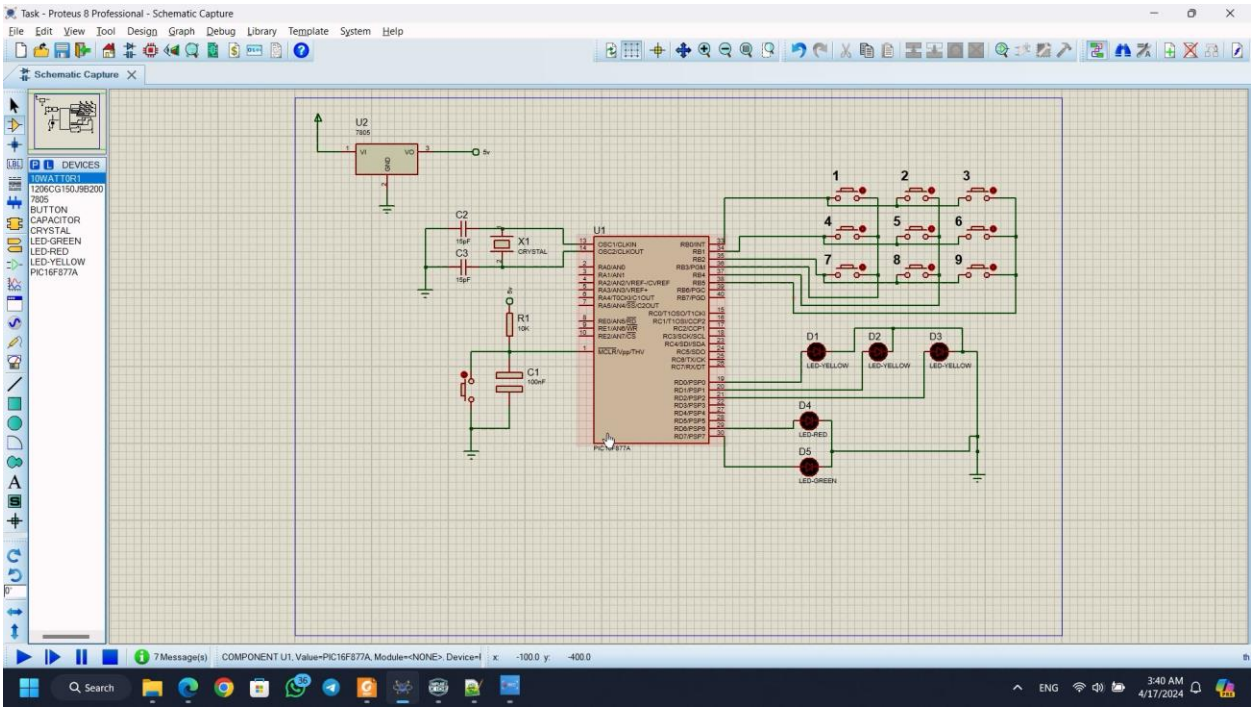
Screenshot of the circuit



Code:

```
/*
 * File:   main.c
 * Author: engay
 *
 * Created on April 17, 2024, 2:22
AM
 */

#define _XTAL_FREQ (8000000)

#include <xc.h>

#define random_number(min,max)
(rand() % ((max)-(min)+1)+(min))
#define LED_RED PORTDbits.RD6
#define LED_Green PORTDbits.RD7
#define LED_Yellow0 PORTDbits.RD0
```

```
#define LED_Yellow1 PORTDbits.RD1
#define LED_Yellow2 PORTDbits.RD2



void keypad_init(void)
{
    OPTION_REGbits.nRBPU = 0;
    TRISB = 0x38; // 0011 1000
(0,1,2)-O/P (3,4,5)-I/P
    PORTB =0x07;  // 0000 0111
(0,1,2) are initially high to make
rows the provider of volt
    TRISD = 0; // Make LEDs Output
    PORTD = 0; // Put Low on all
pins
    return;
}
```

```
char keypad_get_key(void)
{
    char num='\0';
    while(num=='\0')
    {
        // First Row
        PORTB=0x07;
        PORTBbits.RB0=0;
        if(PORTBbits.RB3==0)
        {
            num=1;
        }
        else if(PORTBbits.RB4==0)
        {
            num=2;
        }
        else if(PORTBbits.RB5==0)
        {
```

```
    num=3;
}

// Second Row
PORTB=0x07;
PORTBbits.RB1=0;
if(PORTBbits.RB3==0)
{
    num=4;
}
else if(PORTBbits.RB4==0)
{
    num=5;
}
else if(PORTBbits.RB5==0)
{
    num=6;
}
```

```
        // Third Row
        PORTB=0x07;
        PORTBbits.RB2=0;
        if(PORTBbits.RB3==0)
        {
            num=7;
        }
        else if(PORTBbits.RB4==0)
        {
            num=8;
        }
        else if(PORTBbits.RB5==0)
        {
            num=9;
        }
    }
    PORTB=0x07;
```

```
    return num;
}


void main(void) {
    keypad_init();

    int actual_num;
    int guess_num;

    int i;
    for(i=0;i<3;i++)
    {

actual_num=random_number(1,9);
        guess_num=keypad_get_key();

        __delay_ms(1000);
```

```
        if(actual_num==guess_num)
        {
            PORTD=0;
            LED_Green=1;
            while(1);
        }
        else
        {
            LED_Yellow0=
((actual_num & 1<<2)!=0);
            LED_Yellow1=
((actual_num & 1<<1)!=0);
            LED_Yellow2=
((actual_num & 1<<0)!=0);
        }
    }
```

```
    PORTD=0x07;
    LED_RED=1;
    while(1);


    return;
}
```