Date : 18/04/2022

CSLR61 : EMBEDDED SYSTEMS
LAB-8

Roll no.: **106119100**

Name: **Rajneesh Pandey**

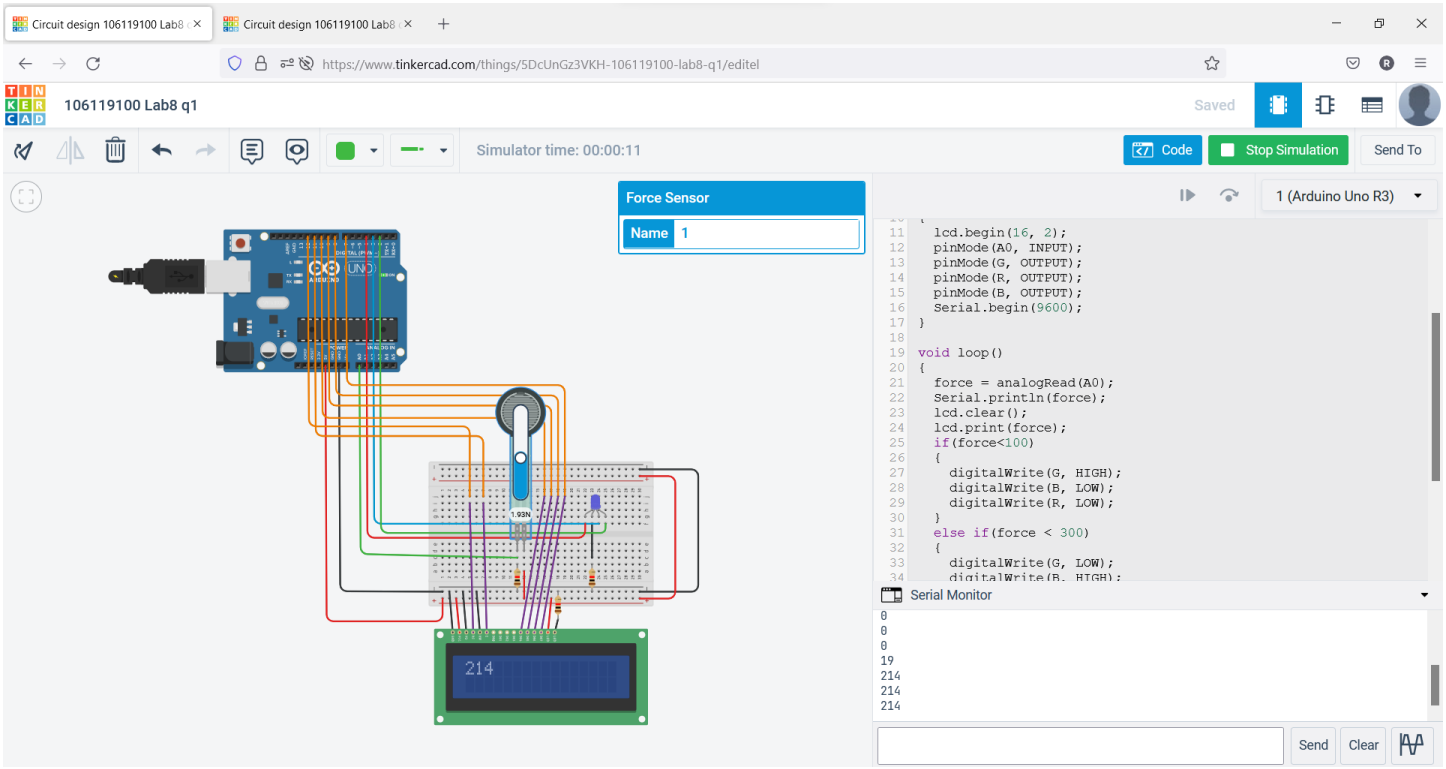
Section: **CSE-B**

1. Interface force sensor with Arduino board and display the amount of force given as input to sensor in LCD screen. Also, interface LED RGB and change colour of the LED based on the some threshold values.

Link
https://www.tinkercad.com/things/5DcUnGz3VKH-106119100-lab8-q1/editel?sharecode=JHq59qpZhKhb5HB661qiAM9QHw7z_XDrp2QK9USTIS4

```
// 106119100 Rajneesh Pandey
#include <LiquidCrystal.h>
LiquidCrystal lcd(12, 11, 10, 9, 8, 7);
int force = 0;
int R = 4;
int B = 3;
int G = 2;
void setup()
{
    lcd.begin(16, 2);
    pinMode(A0, INPUT);
    pinMode(G, OUTPUT);
    pinMode(R, OUTPUT);
    pinMode(B, OUTPUT);
    Serial.begin(9600);
}
void loop()
{
    force = analogRead(A0);
    Serial.println(force);
    lcd.clear();
    lcd.print(force);
    if (force < 100)
    {
        digitalWrite(G, HIGH);
        digitalWrite(B, LOW);
        digitalWrite(R, LOW);
```

```
    }
    else if (force < 300)
    {
        digitalWrite(G, LOW);
        digitalWrite(B, HIGH);
        digitalWrite(R, LOW);
    }
    else
    {
        digitalWrite(R, HIGH);
        digitalWrite(G, LOW);
        digitalWrite(B, LOW);
    }
    delay(1000);
}
```

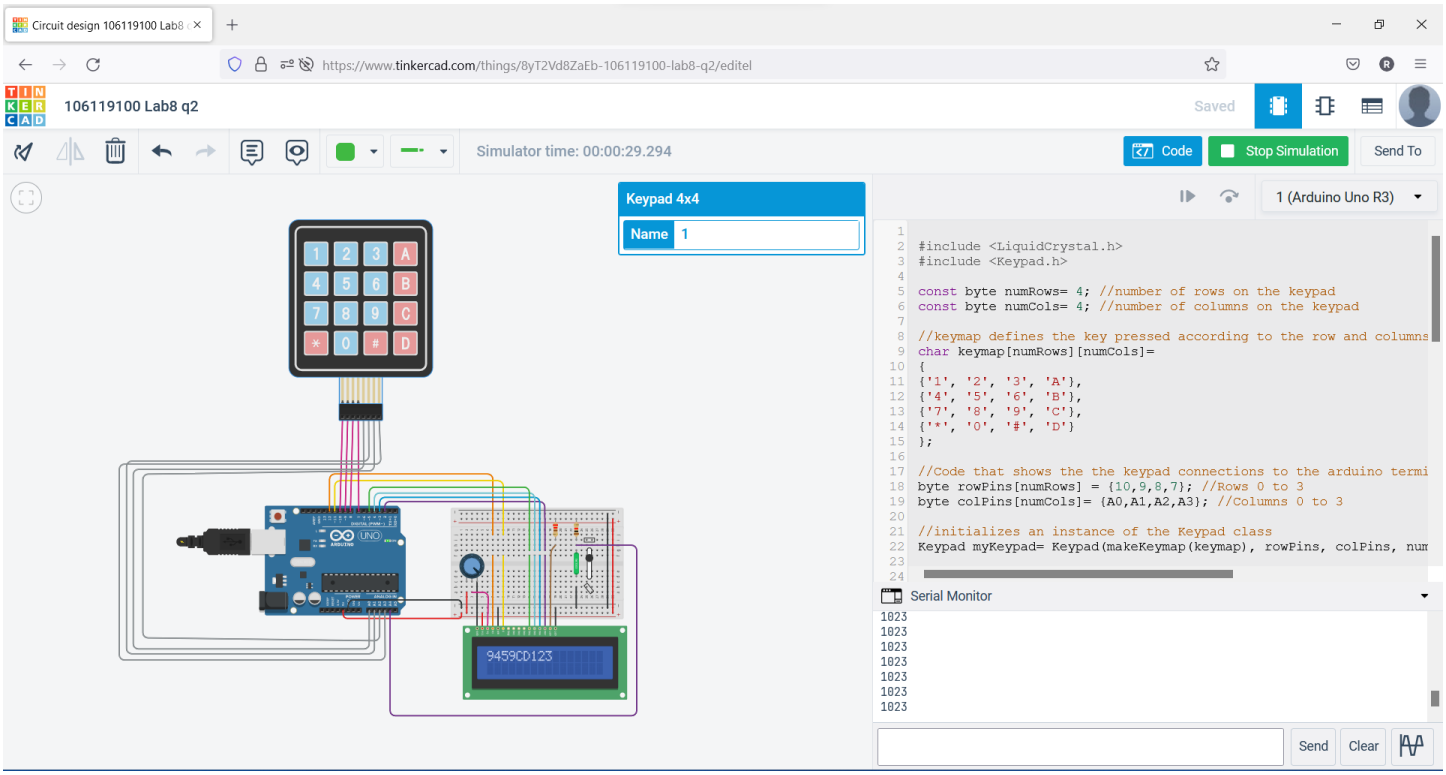


2. Interface the keypad and tilt sensor with Arduino board, if the sensor is being tilted, then take input from keypad and print it in the LCD.

Link
https://www.tinkercad.com/things/8yT2Vd8ZaEb-106119100-lab8-q2/editel?sharecode=cTdYGK3DKBbGd5nclB7T03VDdGdG2jeujSZRl4OOThE

```
// 106119100 Rajneesh Pandey
#include <LiquidCrystal.h>
#include <Keypad.h>

const byte numRows = 4; // number of rows on the keypad
const byte numCols = 4; // number of columns on the keypad

// keymap defines the key pressed according to the row and columns just as
appears on the keypad
char keymap[numRows][numCols] =
    {
        {'1', '2', '3', 'A'},
        {'4', '5', '6', 'B'},
        {'7', '8', '9', 'C'},
        {'*', '0', '#', 'D'}};

// Code that shows the the keypad connections to the arduino terminals
byte rowPins[numRows] = {10, 9, 8, 7};    // Rows 0 to 3
byte colPins[numCols] = {A0, A1, A2, A3}; // Columns 0 to 3

// initializes an instance of the Keypad class
Keypad myKeypad = Keypad(makeKeymap(keymap), rowPins, colPins, numRows,
numCols);

LiquidCrystal lcd(12, 11, 5, 4, 3, 2);
int tilt = A4;

char buf[16] = {0};
```

```
int cnt = 0;

void setup()
{
    Serial.begin(9600);
    lcd.begin(16, 2);
    pinMode(tilt, INPUT);
}

void loop()
{
    int reading = analogRead(tilt);

    char keypressed = myKeypad.getKey();

    Serial.println(reading);

    if (reading > 100)
    {

        buf[cnt] = keypressed;
        if (keypressed != 0)
            cnt++;
        cnt %= 16;
        buf[cnt] = 0;
        lcd.clear();
        lcd.print(buf);
    }
    else
    {
        lcd.clear();
        lcd.print("IDLE");
    }

    delay(50);
}
```


Circuit design 106119100 Lab8
https://www.tinkercad.com/things/8yT2Vd8ZaEb-106119100-lab8-q2/editel
106119100 Lab8 q2
Saved
Simulator time: 00:00:29.294
Code
Stop Simulation
Send To
Keypad 4x4
Name 1
1 (Arduino Uno R3)
#include <LiquidCrystal.h>
#include <Keypad.h>
const byte numRows= 4; //number of rows on the keypad
const byte numCols= 4; //number of columns on the keypad
//keymap defines the key pressed according to the row and columns
char keymap[numRows][numCols]=
{
{'1', '2', '3', 'A'},
{'4', '5', '6', 'B'},
{'7', '8', '9', 'C'},
{'*', '0', '#', 'D'}
};
//Code that shows the the keypad connections to the arduino termi
byte rowPins[numRows] = {10,9,8,7}; //Rows 0 to 3
byte colPins[numCols]= {A0,A1,A2,A3}; //Columns 0 to 3
//initializes an instance of the Keypad class
Keypad myKeypad= Keypad(makeKeymap(keymap), rowPins, colPins, num
Serial Monitor
1023
1023
1023
1023
1023
1023
1023
Send
Clear
9459CD123