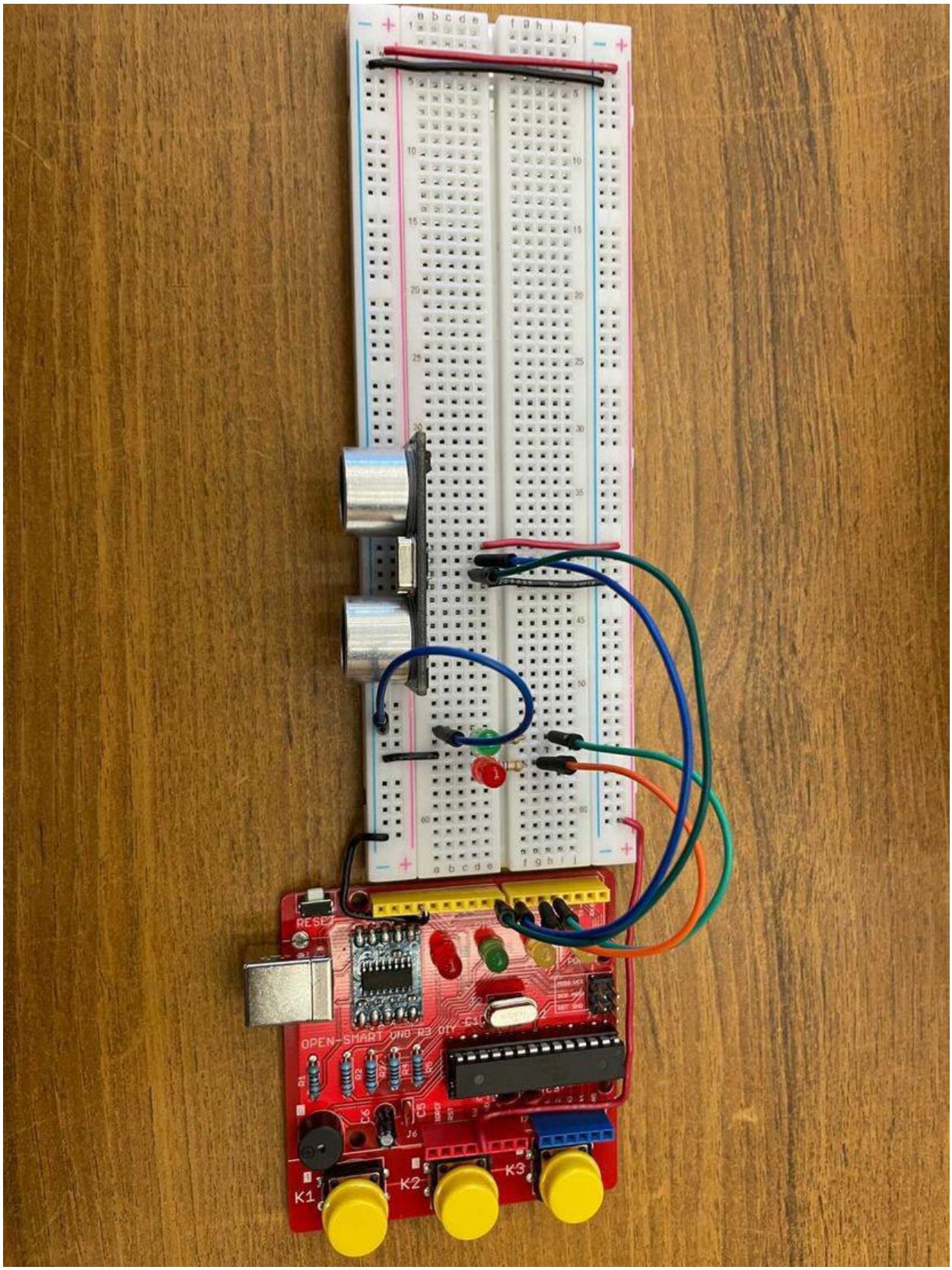
Interfacing Lab 6 ***/10*** *names:* ***Siddharth & Mostafa***

LVL	Criteria
R	
1	
2	
3	
4	"build and wire"[3] ☐ circuit is correct, routed cleanly and easy to follow[1½] ☐ all full voltage wire red and all gnd wires black ☐ signal wire colours chosen to allow easier tracing of circuit[½] tinkerCAD[2] ☐ all components mounted on breadboard and do not block view of other components[½] ☐ wires horizontal or vertical only with 90 degree bends[½] ☐ wires do not cross in front or behind other components or component terminals and do not run on top of one another[½] ☐ wires and component do not share the same hole on the breadboard and wires do not cross when possible[½] in person[2] ☐ all full voltage and gnd wires are solid core, flat to breadboard, horizontal or vertical with 90 degree bends ☐ solid core wires stripped 6-8mm[½] ☐ no bare wire visible [½] “programming”[3] ☐ final “test your understanding” complete and working correctly[1½] ☐ code commenting is accurate and complete (including title)[½] ☐ program structure and spacing is logical and demonstrates organization[½] ☐ code text submission is `courier new font` and is coloured to allow easier identification of comments[½] “inspection questions”[1] ☐ demonstrates full understanding of circuit and interfacing concepts in conversation with teacher
4+	“enhancements”[1] ☐ minimized number and length of wires and wire crossings[½] ☐ circuit enhancement complete and working correctly[½]

Build image:



code:

```
/*
Names: Siddarth & Mostafa
Dates: May, 2, 2022
Description: Code for interfacing lab 6 - Buzzer
*/

// declare variables for pins
int trig = 7;
int echo = 8;
int greenLed = 4;
int redLed = 5;
int buzzer = 6;

float distance, duration;

// Array of tones: these will play the intro to "Dream On" by Aerosmith
// 2D Array: Each pair has a tone and the tone's delay: {tone, delay}
int musicalNotes[][2] =
{{415,500},{261,500},{415,500},{261,500},{392,500},{261,500},{392,500},{261,500},{41
5,500},{261,500},{415,500},{261,500},{392,500},{261,500},{392,500},{261,500},{415,50
0},{261,500},{415,500},{261,500},{467,500},{261,500},{467,500},{261,500},{527,500},{
261,500},{527,500},{261,500},{527,2000}};

void setup()
{
    for(int i = 4; i < 7; i++)
    {
        pinMode(i,OUTPUT); // Sets pins 4,5,6 as OUTPUT pins
    }
    pinMode(echo, INPUT); // Sets the echo pin as INPUT
    pinMode(trig, OUTPUT); // Sets the trigger pin as OUTPUT
}

void loop()
{
    /************ Start US Measurement Section ***********/
    digitalWrite(trig, LOW);
```

```
    delayMicroseconds(2);
    digitalWrite(trig, HIGH);
    delayMicroseconds(10);
    digitalWrite(trig, LOW);
    duration = pulseIn(echo, HIGH);
    distance = duration * 0.034/2;
    /************** End US Measurement Section ***********/



    // if distance is less than 50cm
    if (distance < 50)
    {
        digitalWrite(redLed, HIGH);
        digitalWrite(greenLed, LOW);

        //Iterates through the musicalNotes array and plays the song "Dream On"
        for(int i = 0; i < sizeof(musicalNotes)/sizeof(musicalNotes[0]); i++)
        {
          tone(buzzer,musicalNotes[i][0]); //plays tone
          delay(musicalNotes[i][1]); //delay value corresponds to each tone in array
        }

    }

    // if distance is less than 70cm
    else if (distance < 70)
    {
        digitalWrite(redLed, LOW);
        digitalWrite(greenLed, HIGH);
        tone(buzzer, 430);
    }

    // if distance is less than 90cm
    else if (distance < 90)
    {
        digitalWrite(redLed, LOW);
        digitalWrite(greenLed, HIGH);
        tone(buzzer, 370);
```

```
    }

    // if distance is less than 110cm
    else if (distance < 110)
    {
        digitalWrite(redLed, LOW);
        digitalWrite(greenLed, HIGH);
        tone(buzzer, 340);
    }

    // if distance is greater than or equal to 110cm
    else
    {
      noTone(buzzer);
      digitalWrite(redLed, LOW);
      digitalWrite(greenLed, HIGH);
    }

    delay(10); // small delay to save system resources
}
```