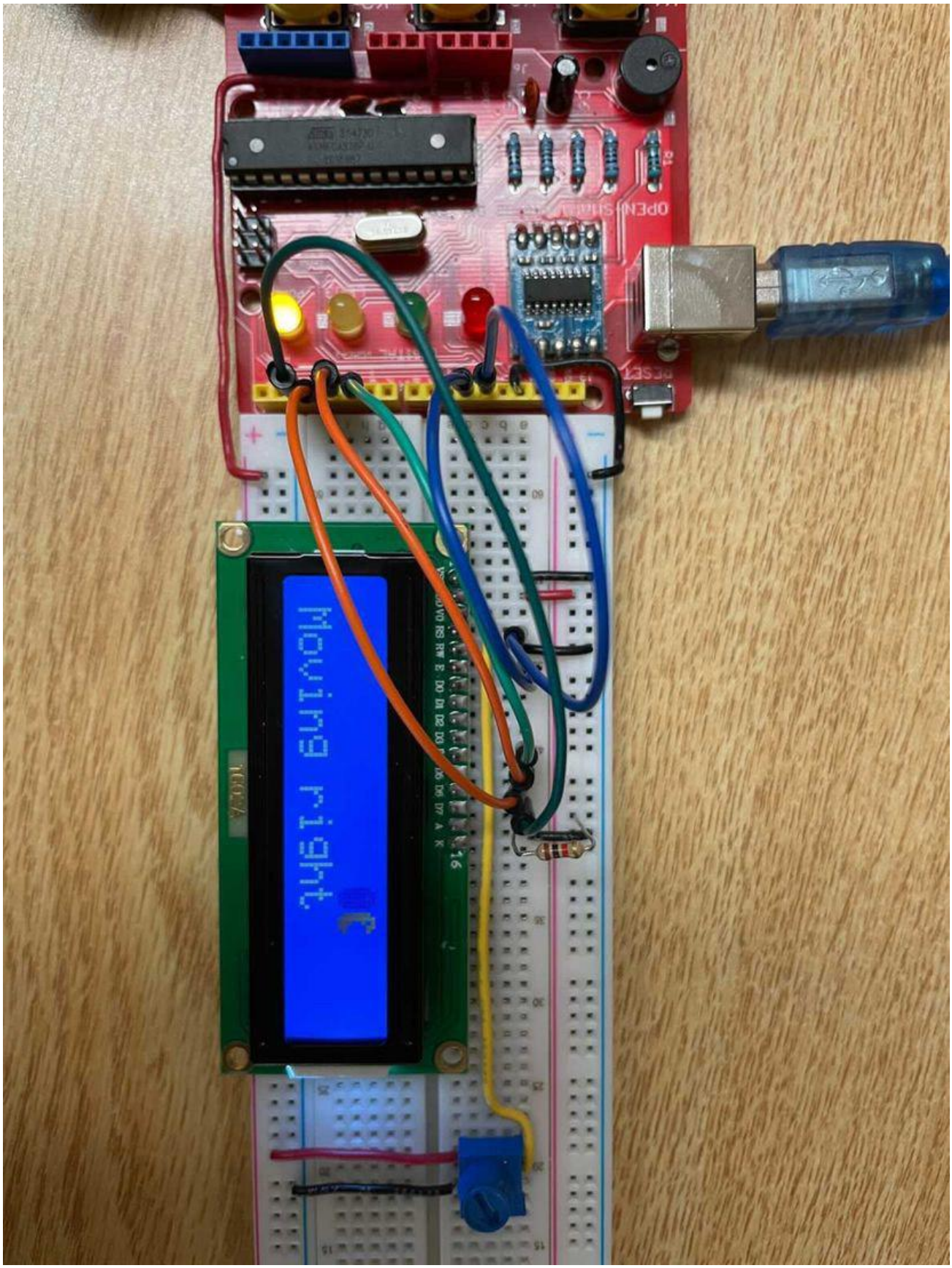
***Interfacing Lab 7*** ***/10*** *names:* ***Siddharth & Mostafa***

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

**Build image:**



**code:**

```
/*
Names: Siddarth & Mostafa
Dates: May, 2, 2022
Description: Code for interfacing lab 7 - LCD
This lab simulates the character "Pac man" moving from left to right (the text
displays "moving right"), and then from right to left (the text displayed "moving
left"), with his mouth opening and closing as he does so.
*/

#include <LiquidCrystal.h>

// initialize the library with the numbers of the interface pins
LiquidCrystal lcd(12, 11, 5, 4, 3, 2);

//pacman with mouth open pattern
byte pacManOpen[] = {
  B01110,
  B11011,
  B11100,
  B11000,
  B11000,
  B11100,
  B11111,
  B01110
};

//pacman with mouth closed pattern
byte pacManClosed[] = {
  B01110,
  B11011,
  B11111,
  B11111,
  B11111,
  B11111,
  B11111,
  B01110
};
```

```
byte pacManOpen2[] = {
  B01110,
  B11011,
  B00111,
  B00011,
  B00011,
  B00111,
  B11111,
  B01110
};

int position = 0;
int direction = 1;
int openMouth = 1;

void setup() {
  lcd.begin(16, 2); // set up the LCD's number of columns and rows

  // Print a message to the LCD
  lcd.createChar(1, pacManClosed);
  lcd.clear();
  lcd.setCursor(0, 0);
}



void loop() {
  if (position == 0)
  {
    direction = 1; //Moves from left to right
    lcd.createChar(0, pacManOpen);
  }

  else
  {
    direction = -1; //Moves from right to left
    lcd.createChar(0, pacManOpen2);
  }
```

```
  while ((position != 0 && direction == -1)||(position != 15 && direction == 1))
  {
    lcd.clear();
    lcd.setCursor(position,0);
    lcd.write(byte(openMouth));
    lcd.setCursor(0,1);

    if (direction == 1)
    {
      lcd.print("Moving right"); //Displays direction of pacman: right
    }
    else
    {
      lcd.print("Moving left"); //Displays direction of pacman: right
    }

    position += direction;
    if (openMouth == 0)
    {
      openMouth = 1;
      delay(200);
    }
    else
    {
      openMouth = 0;
      delay(100);
    }

  }

}
```