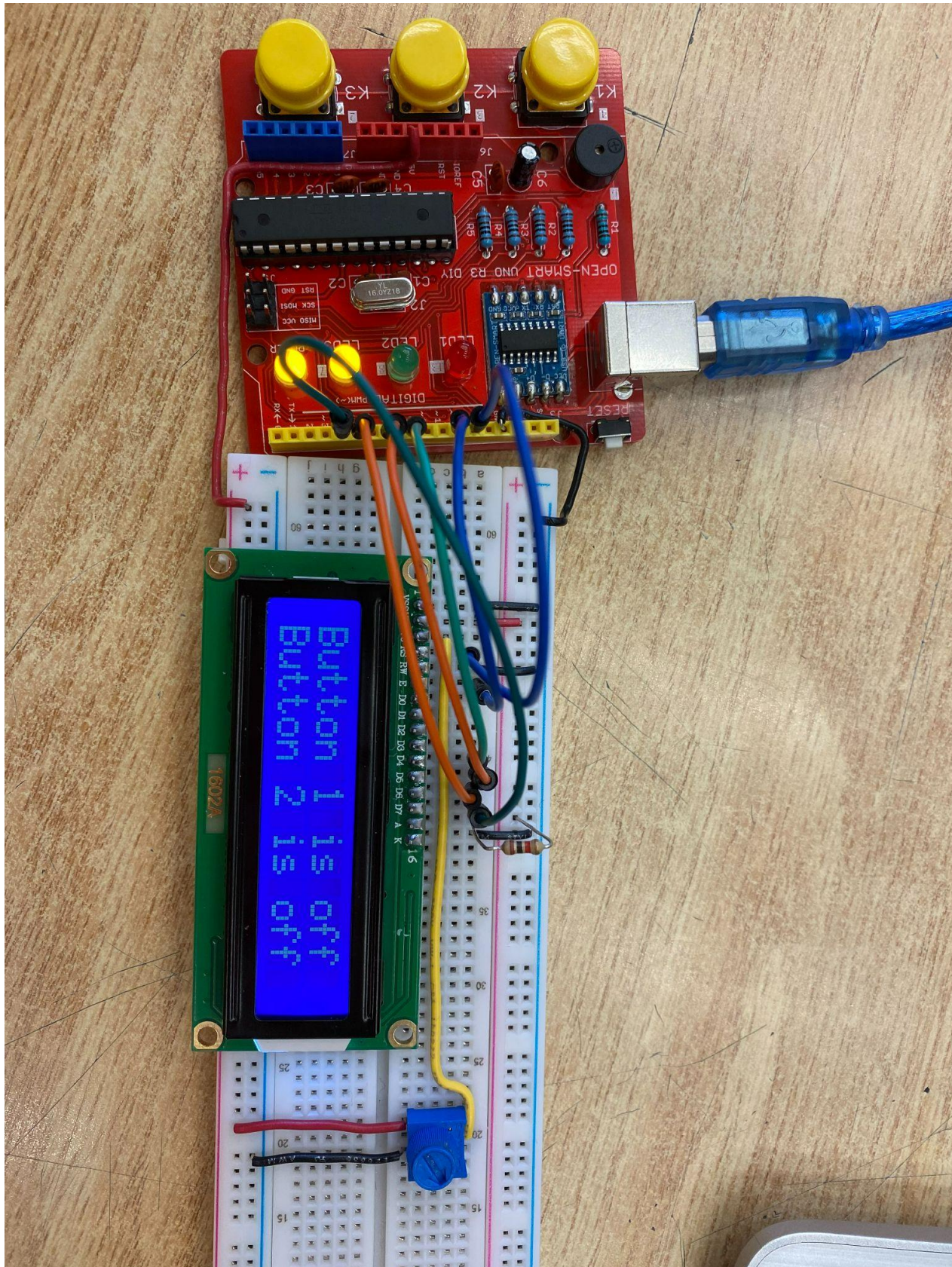


LVL	Criteria
R	
1	
2	
3	
4	<p>"build and wire"[3]</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> circuit is correct, routed cleanly and easy to follow[1½]</li> <li><input type="checkbox"/> all full voltage wire red and all gnd wires black</li> <li><input type="checkbox"/> signal wire colours chosen to allow easier tracing of circuit[½]</li> </ul> <p>tinkerCAD[2]</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> all components mounted on breadboard and do not block view of other components[½]</li> <li><input type="checkbox"/> wires horizontal or vertical only with 90 degree bends[½]</li> <li><input type="checkbox"/> wires do not cross in front or behind other components or component terminals and do not run on top of one another[½]</li> <li><input type="checkbox"/> wires and component do not share the same hole on the breadboard and wires do not cross when possible[½]</li> </ul> <p>in person[2]</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> all full voltage and gnd wires are solid core, flat to breadboard, horizontal or vertical with 90 degree bends</li> <li><input type="checkbox"/> solid core wires stripped 6-8mm[½]</li> <li><input type="checkbox"/> no bare wire visible [½]</li> </ul> <p>"programming"[3]</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> final "test your understanding" complete and working correctly[1½]</li> <li><input type="checkbox"/> code commenting is accurate and complete (including title)[½]</li> <li><input type="checkbox"/> program structure and spacing is logical and demonstrates organization[½]</li> <li><input type="checkbox"/> code text submission is courier new font and is coloured to allow easier identification of comments[½]</li> </ul> <p>"inspection questions"[1]</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> demonstrates full understanding of circuit and interfacing concepts in conversation with teacher</li> </ul>
4+	<p>"enhancements"[1]</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> minimized number and length of wires and wire crossings[½]</li> <li><input type="checkbox"/> circuit enhancement complete and working correctly[½]</li> </ul>

Build image:



code:

```
/*
Names: Siddarth & Mostafa
Dates: May, 2, 2022
Description: Code for interfacing lab 8 - Pushbuttons
*/

#include <LiquidCrystal.h>

// initialize the library with the numbers of the interface pins
LiquidCrystal lcd(12, 11, 8, 7, 5, 4);

// Declare variables for pins
int pushButton1 = 2;
int pushButton2 = 3;

int state1;
int state2;

void setup() {
    lcd.begin(16, 2); // set up the LCD's number of columns and rows
    lcd.clear();
    lcd.setCursor(0, 0);

    //set push buttons as INPUT_PULLUP
    pinMode(pushButton1, INPUT_PULLUP);
    pinMode(pushButton2, INPUT_PULLUP);
}

void loop() {
    state1 = digitalRead(pushButton1); //read the state of pushbutton 1
    state2 = digitalRead(pushButton2); //read the state of pushbutton 1

    lcd.clear();
    //Both buttons pressed
    if (!state1 && !state2)
    {
        lcd.setCursor(0,0);
    }
}
```

```

    lcd.print("Both are on!!!");
    lcd.setCursor(0,1);
}

//Only pushbutton 1 is pressed
else if (!state1)
{
    lcd.setCursor(0,0);
    lcd.print("Button 1 is on");
    lcd.setCursor(0,1);
    lcd.print("Button 2 is off");
}

//Only pushbutton 2 is pressed
else if (!state2)
{
    lcd.setCursor(0,0);
    lcd.print("Button 1 is off");
    lcd.setCursor(0,1);
    lcd.print("Button 2 is on");
}

//Neither of the buttons are pressed
else
{
    lcd.setCursor(0,0);
    lcd.print("Button 1 is off");
    lcd.setCursor(0,1);
    lcd.print("Button 2 is off");
}
delay(100); //Delay to allow screen to update
}

```