Force Sensor-Based Weight Measurement System

Using Arduino and LCD Display

Introduction

This project develops a force sensor-based weight measurement system. A force sensor detects applied pressure, converting it into a weight value, which is displayed on an LCD screen using Arduino. The system is designed for practical applications like digital weighing.

Objectives

- To design a weight measurement system using Arduino and a force sensor.
- To calibrate the sensor for accurate weight measurement.
- To display measured weight on an LCD screen.
- To ensure precision and reliability in the system’s output.

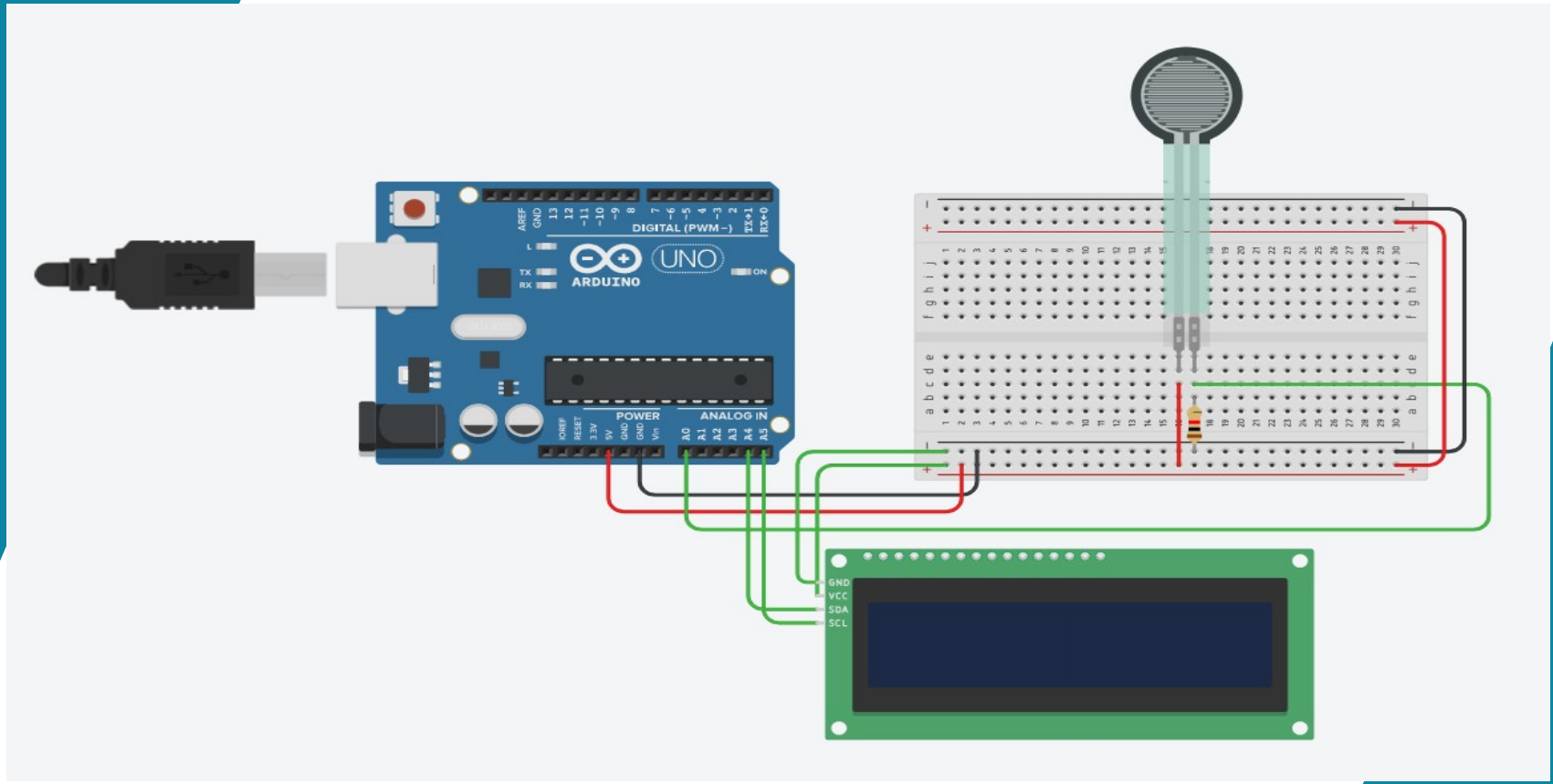

Figure 1: Circuit Diagram of the system

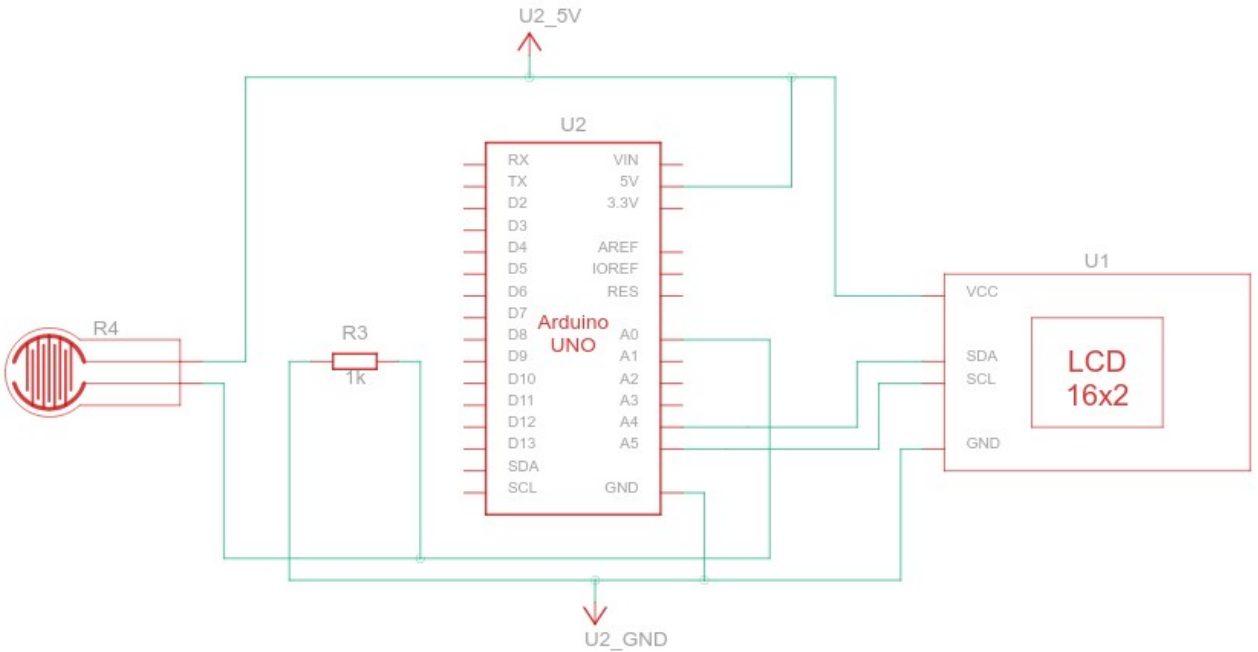

Figure 1: Schematic Diagram of the system

C++ Code

```
#include <Adafruit_LiquidCrystal.h>

Adafruit_LiquidCrystal lcd(0);

float slope = 0.01;
float offset = 0.0;

void setup()
{
  lcd.begin(16, 2);
  lcd.setBacklight(1);
  lcd.print("Welcome!!!");

  pinMode(A0, INPUT);
}
```

```
void loop()
{
  int forceSensorValue = analogRead(A0);
  float voltage = forceSensorValue
                    * (10.0 / 1023.0);
  float weight = voltage * 10.0;

  lcd.setCursor(0, 1);
  lcd.print("Weight: ");
  lcd.print(weight);
  lcd.print(" g");
}
```

Importance of Sensor Calibration

- Ensures accurate, reliable weight readings.
- Establishes sensor-weight linearity.
- Reduces errors and inconsistencies.
- Maintains system accuracy over time.
- Inaccuracy: Improper calibration led to inaccurate data in this project.

Calibration

Thank you

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