PROCTECH 3CC3:
Cloud Computing
Lab Project Report

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I. Project Topic Description

Our lab project idea is an automated parking lot system. This idea involves 4 actions that will take place. The entrance and exit of vehicles, the payment/scanning of parking tickets, the display of % capacity and the cloud-based functionality, for the operator to open and close the gates remotely.

The payment functionality will work in 2 ways.

1. **Users who do not have a card to scan**

These users must press a button at the entrance gate to enter the parking lot. When exiting the parking lot, they must “insert a coin” into the machine to open the gate.

2. **Users who have a valid RFID card / Transponder**

These users will be able to scan their cards coming in and out of the parking lot.

The system consists of 2 Servo motors that control the gates for the entrance and exiting sides of the parking lot. The system will have automatic control with RFID sensors on either side and an ultrasonic sensor. The ultrasonic sensor is used to detect whether a vehicle is present or not. The RFID sensor is used to automatically open the gate for parking pass holders. If the user does not have a parking pass, they will need to press a button to have access to the parking lot, and when exiting they will have to "insert a coin” which would activate the gate to open. The manual mode will give permission for an operator to manually open and close the gates.

II. Technical Components

Inputs	Outputs
RFID Sensor (2)	Servo Motor (2)
Ultrasonic Sensor (2)	LCD Screen (2)
Pushbutton (2)	

Table 1: Inputs and outputs used in the parking lot system.

III. Block Diagram

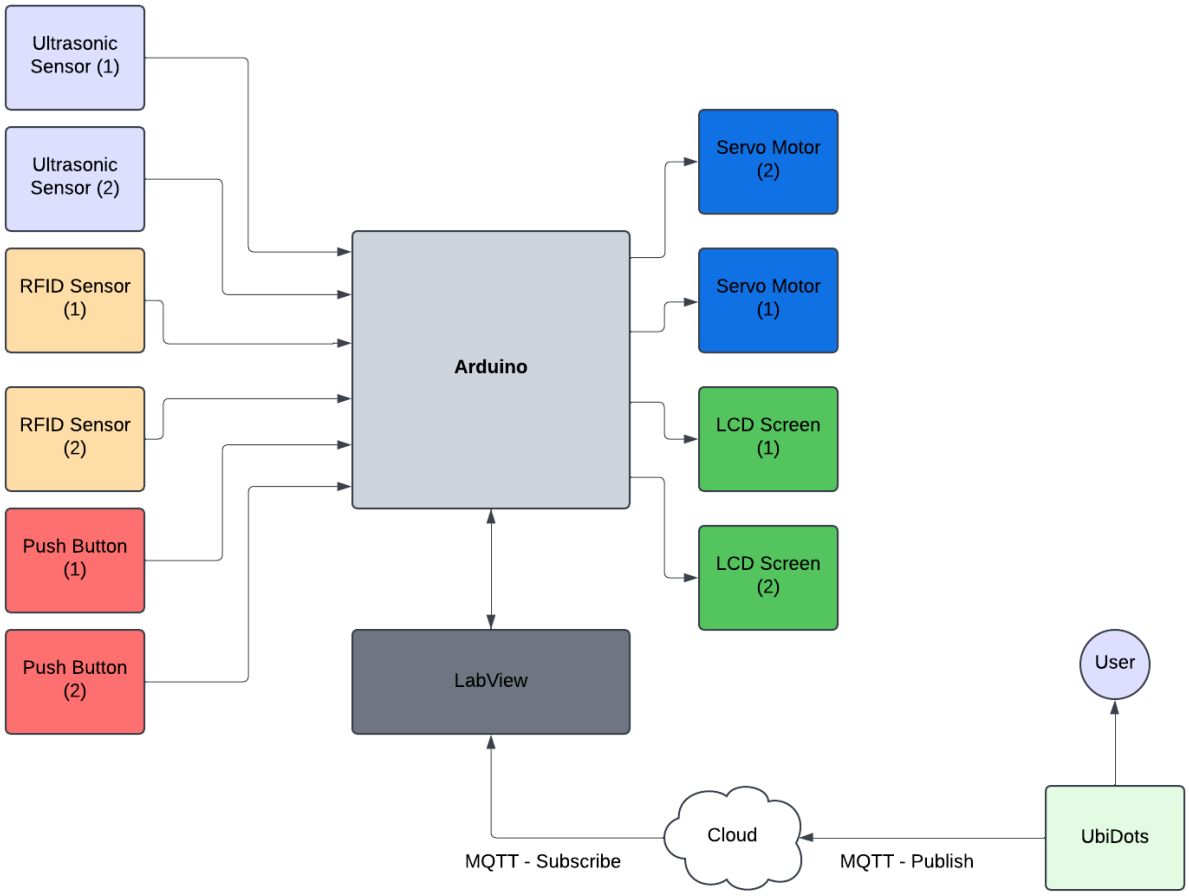

figure 3.1: Block diagram

IV. Pictures with Final Setup

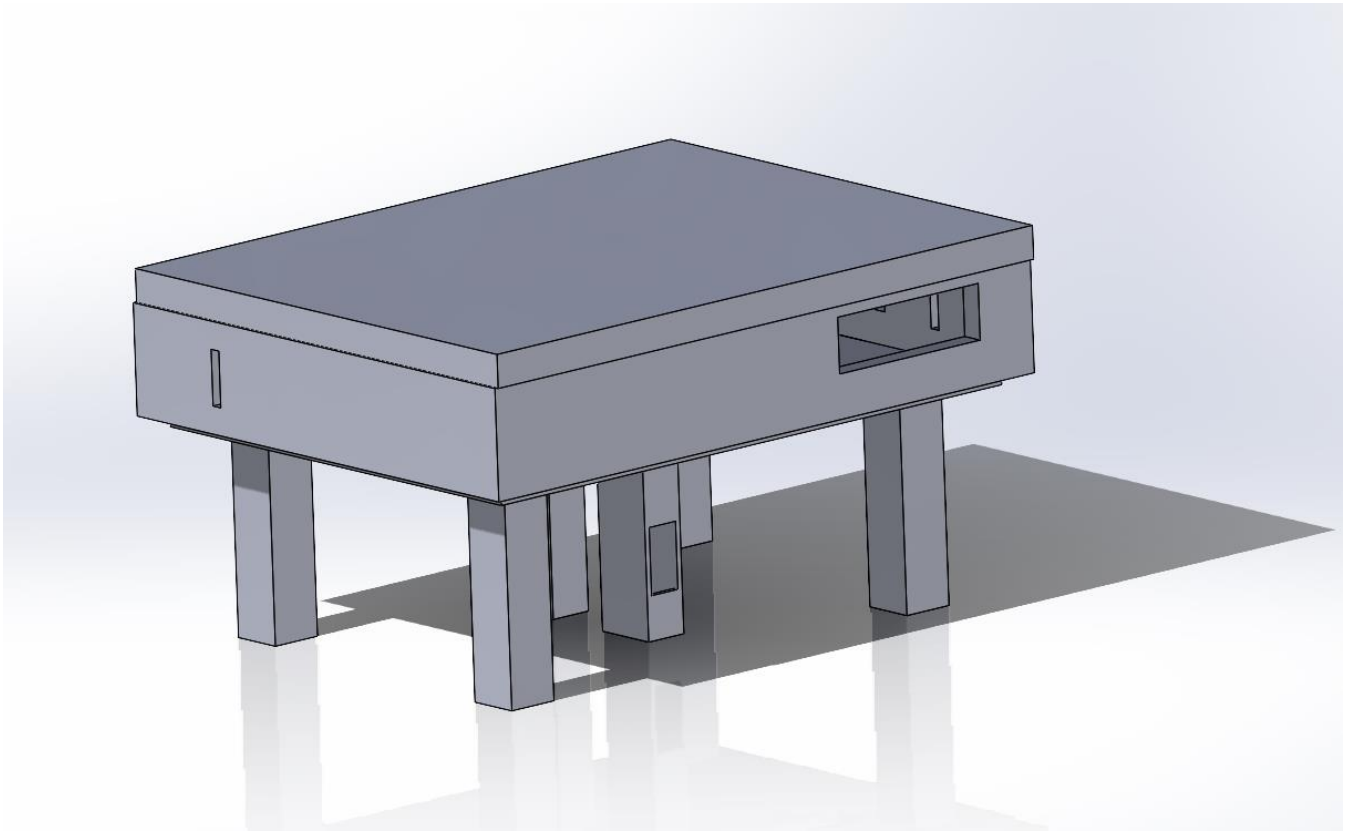

figure 5.1: SolidWorks Final Assembly

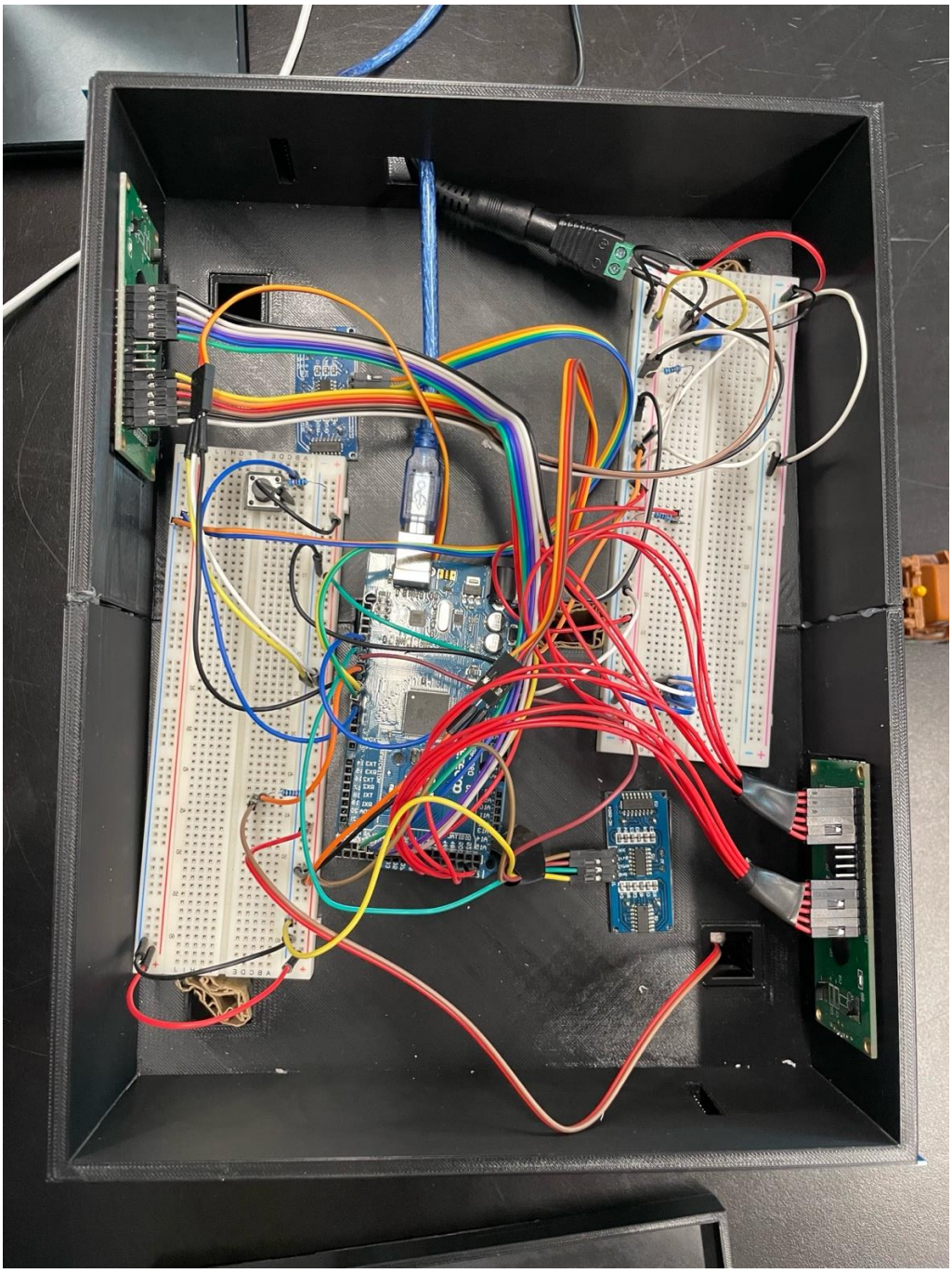

figure 5.2: Final Wiring

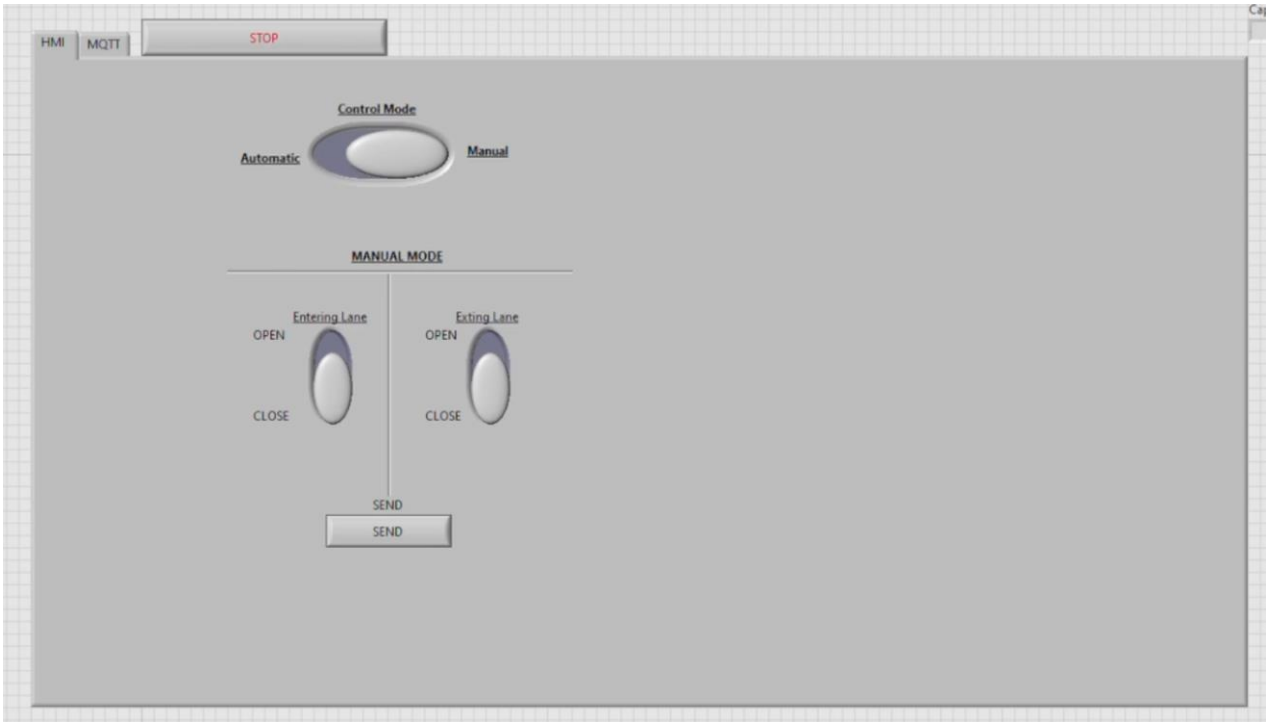

figure 5.3: LabView HMI

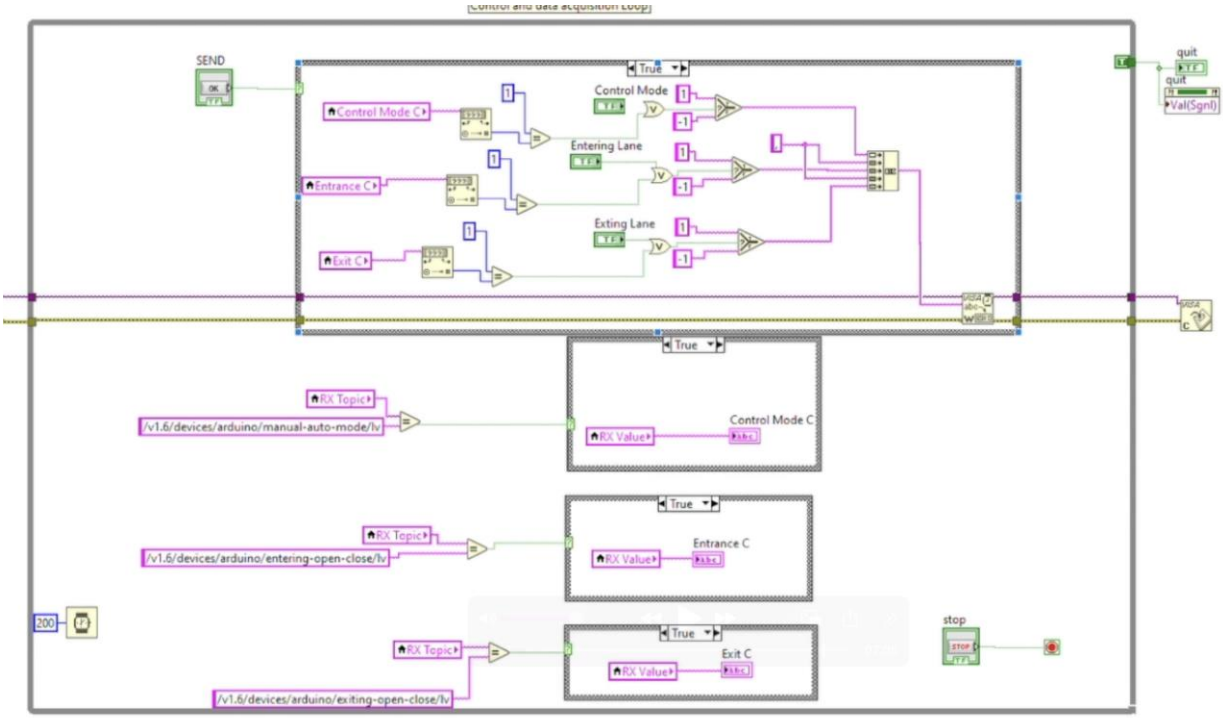

figure 5.4: LabView Block Diagram

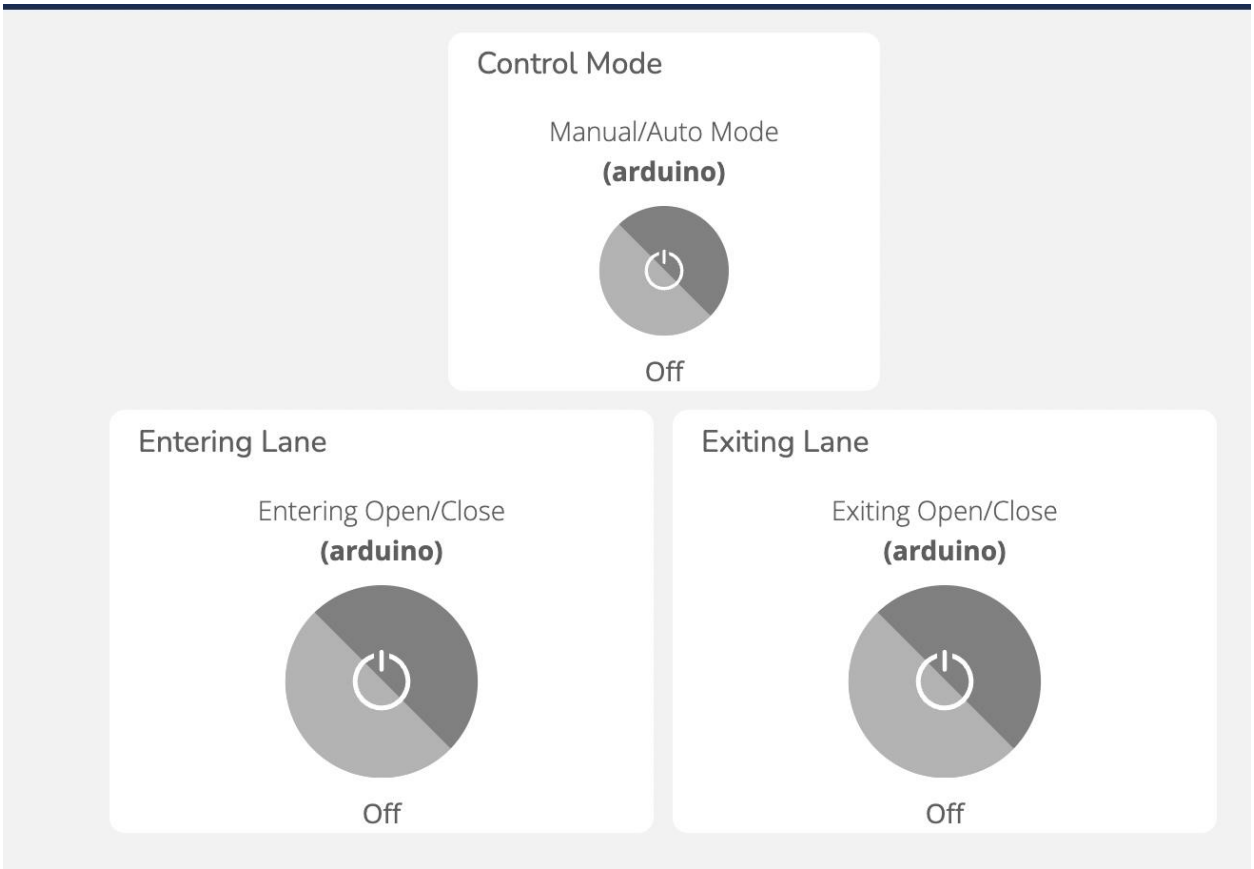

figure 5.5: Cloud Dashboard

V. Wiring Diagram

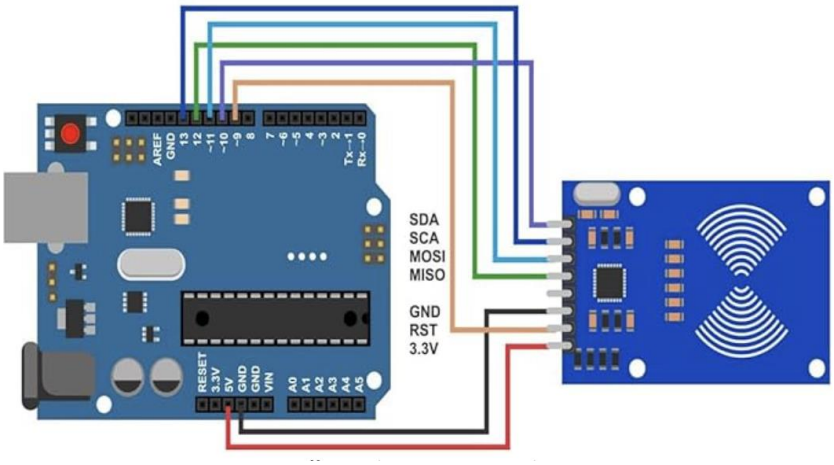

figure 6.1: RFID Sensor wiring (repeated twice , once for each sensor)

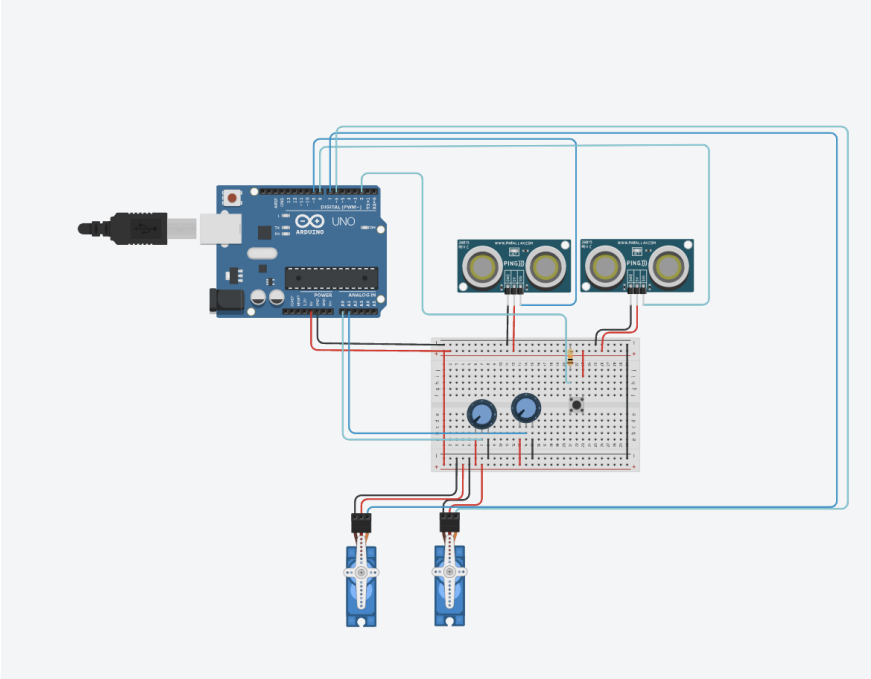

figure 6.2: ultrasonic sensors, servo motors, and pushbutton wiring

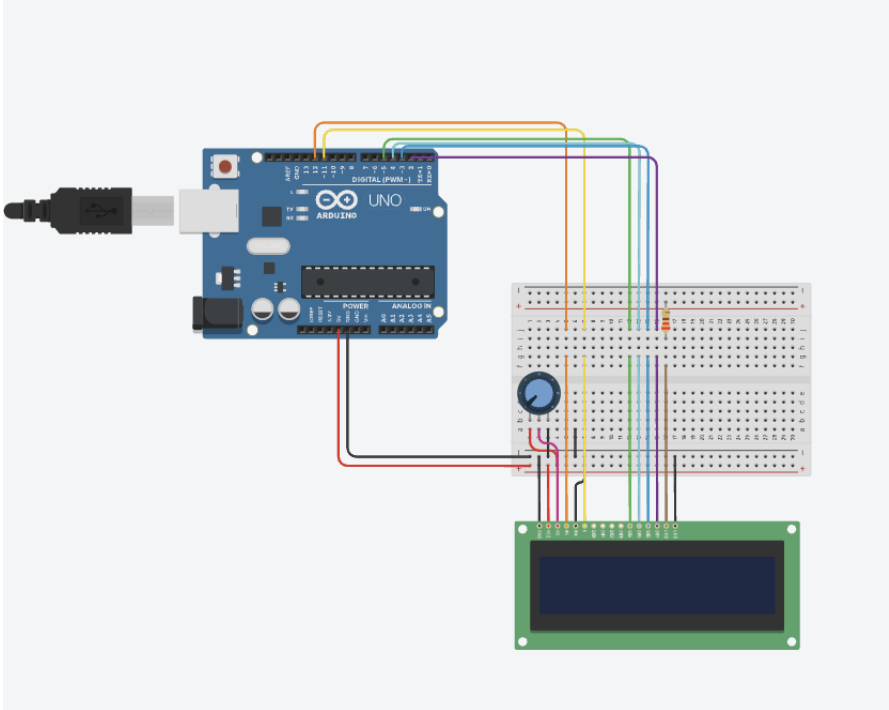

figure 6.3: LCD screen wiring, repeat twice (repeated twice , once for each screen)