Assignment – 2

Name – AYUSH KUMAR SINGH

Reg. No. – 19BEI0134

Email – ayushkumar.singh2019@vitstudent.ac.in

Application Id – SPS_APL_20210012580

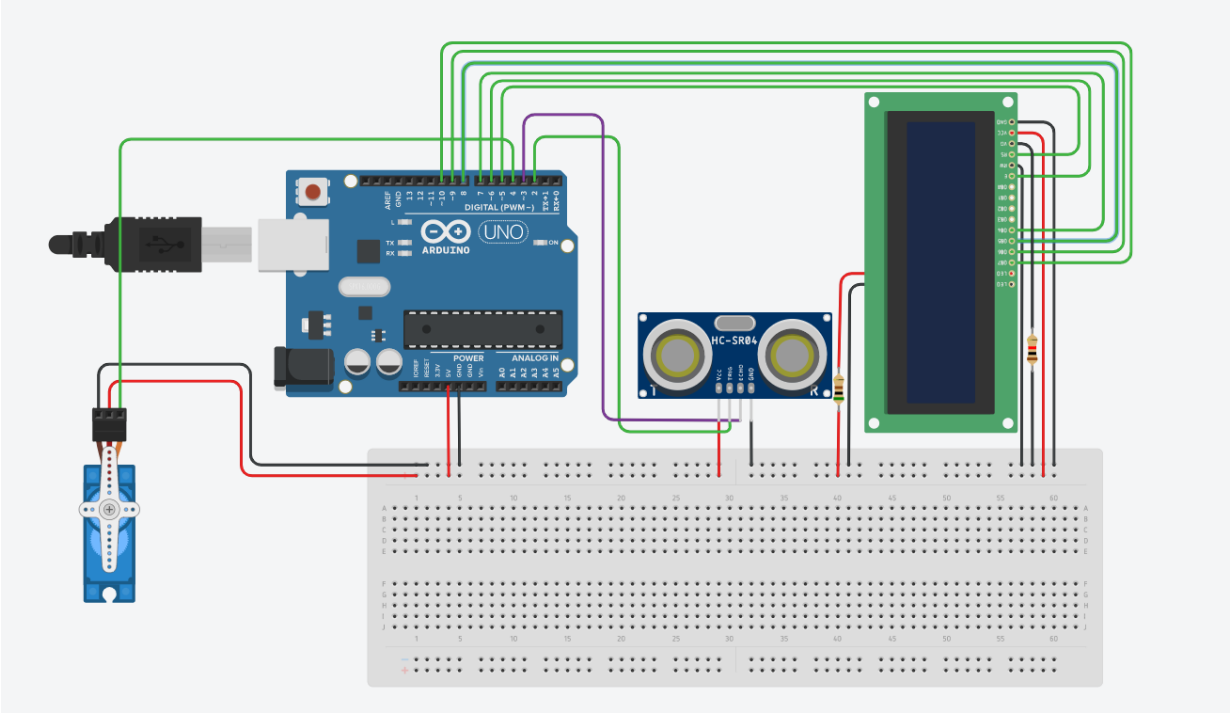
Aim - Develop an "Automatic garage door opening system". Use an Ultrasonic sensor to detect if there is a vehicle in front of the garage. if any vehicle is detected open the garage door (rotate the servo motor) for some time and close it.

Components Required –
1. Arduino uno
2. Ultrasonic Distance Sensor
3. Micro Servo Motor
4. LCD 16x2
5. Breadboard
6. Jumper Wires
7. Resistor

Working - We use an ultrasonic sensor to detect the distance to vehicle from the garage.
Based on the distance if the vehicle is 200cm = 2 m from the ultrasonic sensor the servo motor will rotate for 90 degrees and will open the door of the garage. The door will be opened for 10 seconds and then automatically close.

The distance and opening/closing of the gate will also be displayed on the LCD screen.

Circuit Diagram –



Arduino Code –

```
#include<Servo.h>
#include <LiquidCrystal.h>
const int rs = 5;
const int en = 6;
const int d4 = 7;
const int d5 = 8;
const int d6 = 9;
const int d7 = 10;
Servo s;
LiquidCrystal lcd(rs,en,d4,d5,d6,d7);
void setup()
{
 s.attach(4);
 pinMode(2,OUTPUT);
 pinMode(3,INPUT);
 lcd.begin(16,2);
}

void loop()
{
 float distance = mot();
 dispsys(distance);
}

float mot()
{
 digitalWrite(2,LOW);
 digitalWrite(2,HIGH);
 delayMicroseconds(10);
 digitalWrite(2, LOW);
```

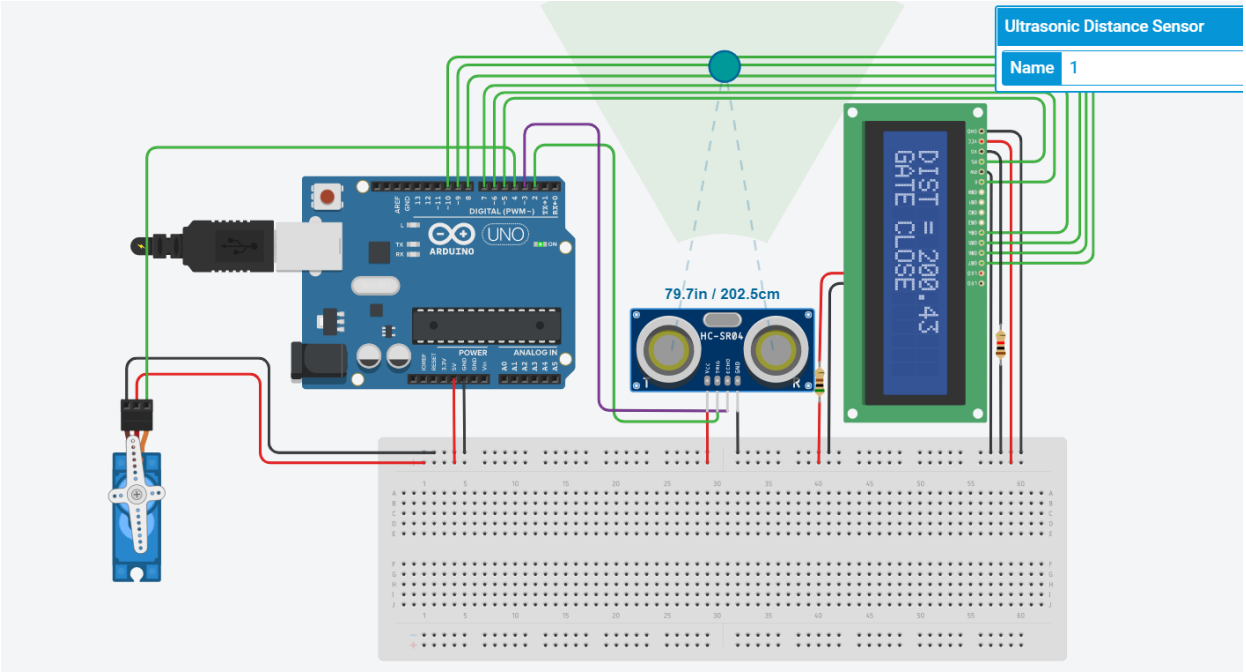
```
 float dur = pulseIn(3, HIGH);
 float dist = (dur * 0.0343)/2;
 return dist;
}

void dispsys(float dis)
{
 if(dis<=200)
 {
  lcd.clear();
            lcd.setCursor(0,0);
            lcd.print("DIST = ");
            lcd.print(dis);
  lcd.setCursor(0,1);
  lcd.print("GATE OPEN");
  s.write(90);
  delay(10000);
 }

 lcd.clear();
 lcd.setCursor(0,0);
 lcd.print("DIST = ");
 lcd.print(dis);
 lcd.setCursor(0,1);
 lcd.print("GATE CLOSE");
 s.write(0);
 delay(1000);
}
```

Output –

DISTANCE > 200 CM THEREFORE GATE IS CLOSED



DISTANCE < 200 CM THEREFORE GATE IS OPEN