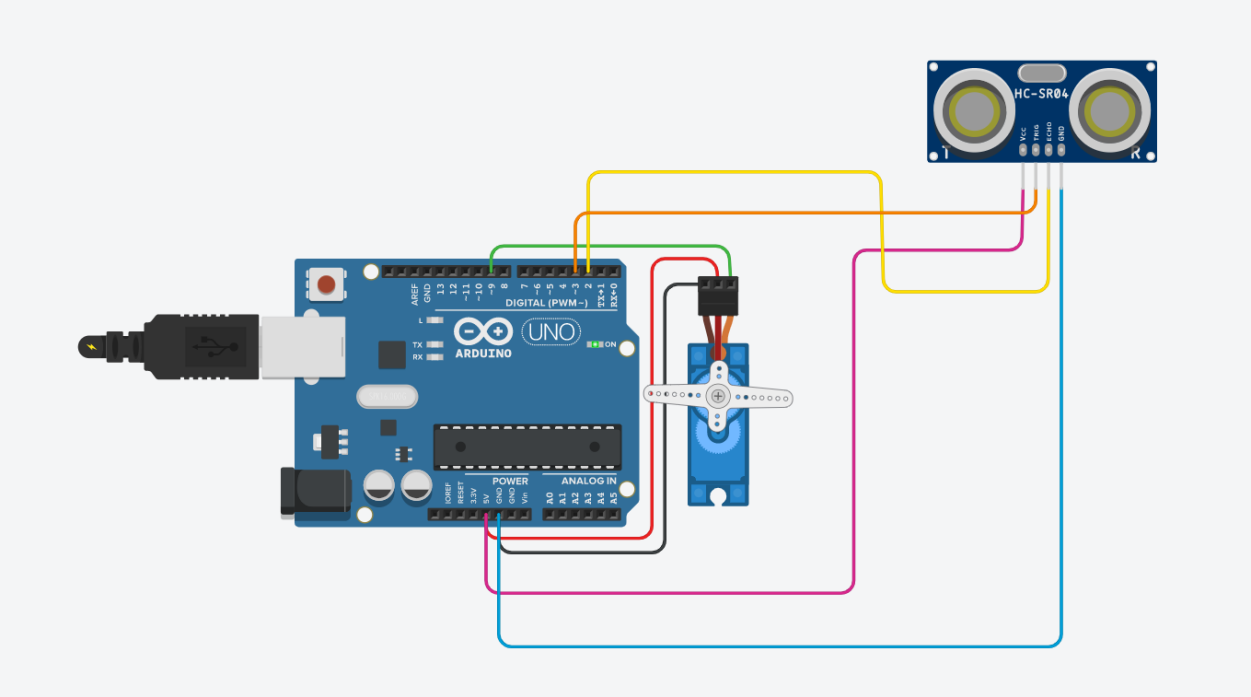
Assignment #2

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.

Arduino circuit consisting of Ultrasonic Distance Sensor and servo motor:



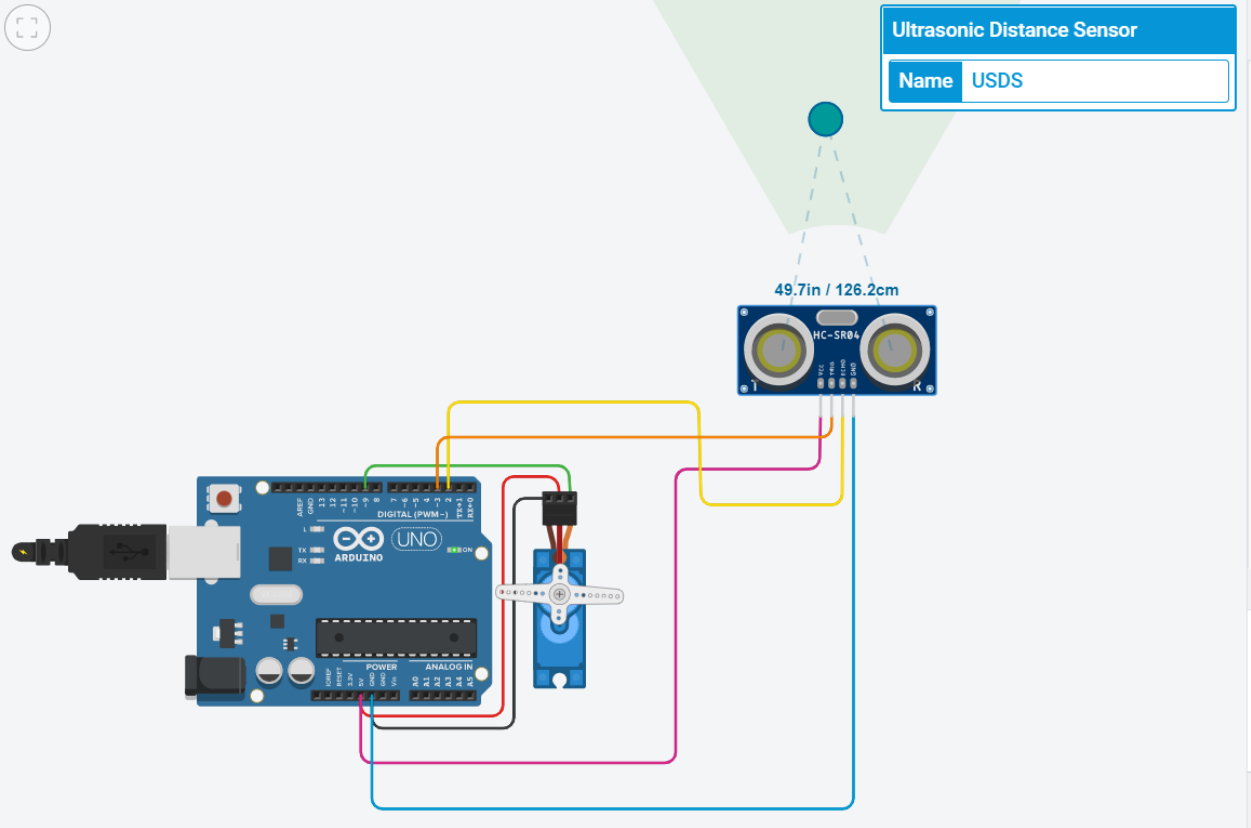
Code:

```
#include <Servo.h>
int trigPin=3; //setting pin 3 as trigger pin
int echoPin=2; //setting pin 2 as echo pin
Servo s;

void setup()
{
  s.attach(9); // attaching pin 9 to servo motor
  s.write(0); // Initializing the motor to zero degree
  pinMode(trigPin,OUTPUT); //setting trigger pin as Output
  pinMode(echoPin,INPUT);  //setting echo pin as Input
  Serial.begin(9600);

}

void loop()
{
  digitalWrite(trigPin, LOW);
  digitalWrite(trigPin, HIGH);//Sending a pulse for 10 ms
  delayMicroseconds(10);
  digitalWrite(trigPin, LOW);
  float dur = pulseIn(echoPin, HIGH); //duration of echo
  float dis = (dur * 0.0343)/2;
  Serial.print("Distance in cm: ");
  Serial.println(dis);
  if (dis<=300) // checking if the vehicle is in range of 3 meters
  {
    Serial.println("inside");
    s.write(90);    //If yes, then rotating servo motor to 90 degree
    delay(2000);
    s.write(0); // restoring it back to zero degree
  }
}

```

Test Cases:

Case 1:

When the vehicle is Inside the range i.e. 3 meters



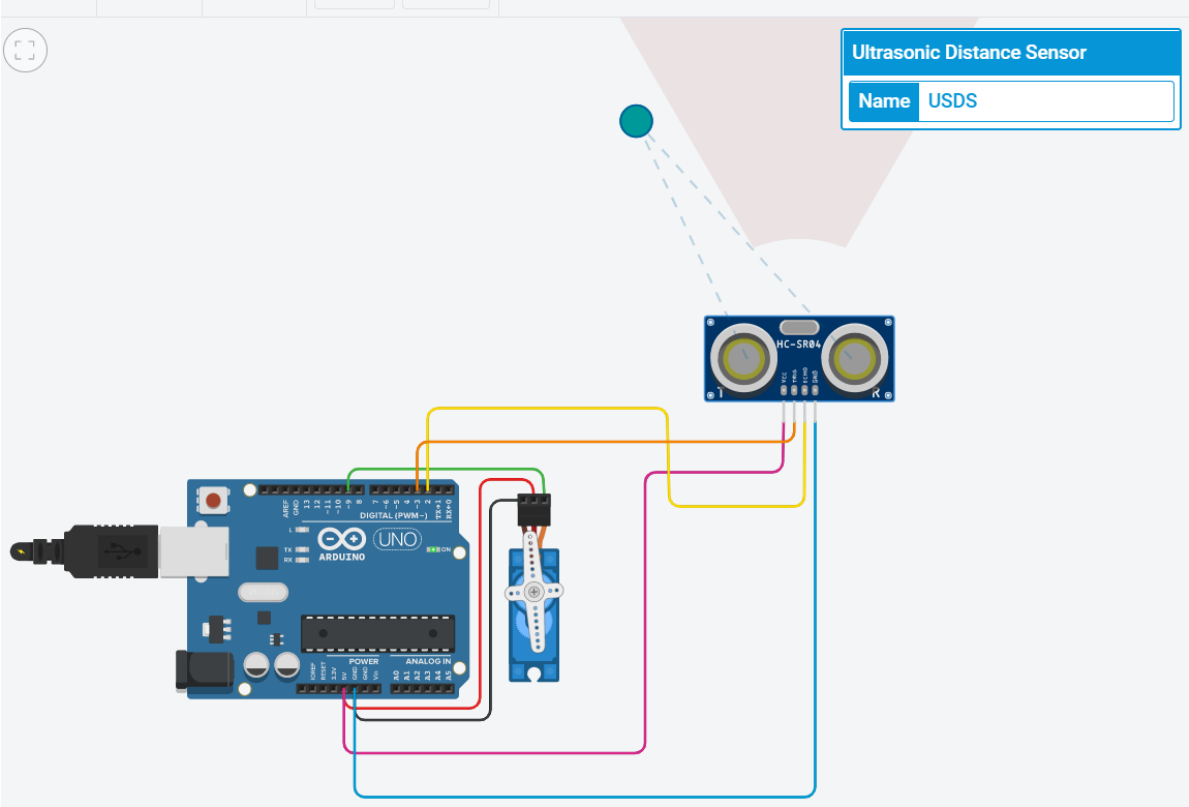
Output:

Serial Monitor

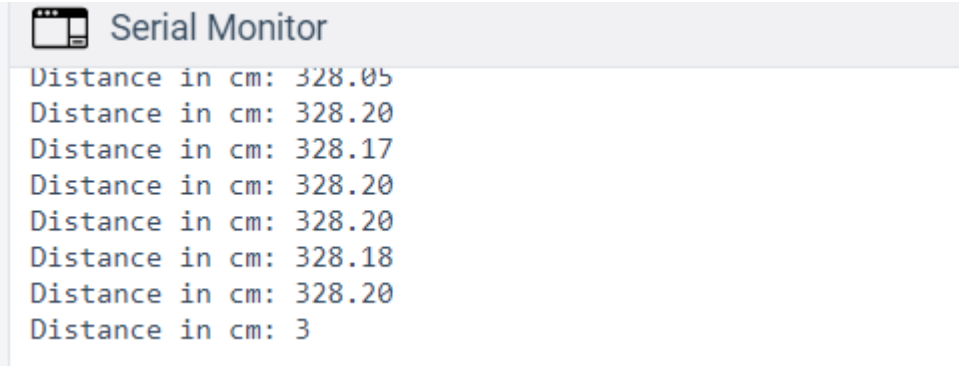
```
Distance in cm: 125.93
inside
Distance in cm: 124.23
inside
Distance in cm: 125.76
inside
Distance in cm: 124.22
inside
```

Case 2:

When it’s not in range of Ultrasonic Distance Sensor



Output:



Conclusion:

The trigger pin sends the pulse and when the vehicle is in range of Ultrasonic Distance Sensor ,and echo is experinced by USDS and the

servo motor rotates to 90 degrees hence open the gate and closes it after sometime.