

Assignment 2

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Question:

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.

Solution:

ScreenShot:

The screenshot displays a simulation environment for an Arduino Uno R3. The circuit includes an Ultrasonic Distance Sensor (HC-SR04) and a Servo Motor. The sensor's VCC is connected to the Arduino's 5V pin, GND to GND, and Trig to digital pin 4. The servo's VCC is connected to 5V, GND to GND, and the signal pin to digital pin 10. A green cone indicates the sensor's detection range, with a label '102.5in / 260.3cm'. The code in the background is as follows:

```
1 //CODE:
2 #include<Servo.h>
3 Servo s;
4 int t = 2;
5 int e = 3;
6 void setup()
7 {
8   pinMode(t, OUTPUT);
9   pinMode(e, INPUT);
10  s.attach(4);
11  Serial.begin(9600);
12 }
13
14 void loop()
15 {
16   digitalWrite(t, LOW);
17   digitalWrite(t, HIGH);
18   delayMicroseconds(10);
19   digitalWrite(t, LOW);
20   float dur = pulseIn(e, HIGH);
21   float dis = (dur * 0.0343)/2; //centimeters
22   Serial.print("Distance in cm: ");
23   Serial.println(dis);
24   s.write(0);
25   if(dis<=327)
26   {
27     for(int i=0;i<=100;i++)
28     {
29       s.write(i);
```

The Serial Monitor shows the following output:

```
Distance in cm: 112.88
Distance in cm: 112.88
Distance in cm: 112.88
Distance in cm: 258.97
Distance in cm: 267.66
Distance in cm: 211.00
Distance in cm: 333.55
Distance in cm: 325.39
```