Assignment 2

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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.

AURDINO CODE:

//Garage opens when vehicle is in proximity of 200cm or less to it

int t=2; //trigger=t

#define e 3 //echo=e

#include <Servo.h>

Servo s;

void setup()

{

  pinMode(2, OUTPUT);

  pinMode(3, INPUT);

  s.attach(5);

  Serial.begin(9600);

}

void loop()

```
{
  digitalWrite(t, LOW);
  digitalWrite(t, HIGH);
  delay(1000);
  digitalWrite(t, LOW);
  float dur=pulseIn(e,HIGH);
  float dis=(dur*0.034)/2;
  Serial.print("Distance in cm: ");
  Serial.println(dis);
  //it has maximum range of 4cm
  if(dis<=200)   // Garage opens when vehicle is in proximity of 125cm or less to it
  {
    for(int i=0;i<=180;i++)
    {
      s.write(i);
      delay(20);
    }
    delay(5000);
    Serial.println("Garage closing");
    for(int j=180;j>=0;j--)
    {
      s.write(j);
      delay(15);
    }
  }
  else
```
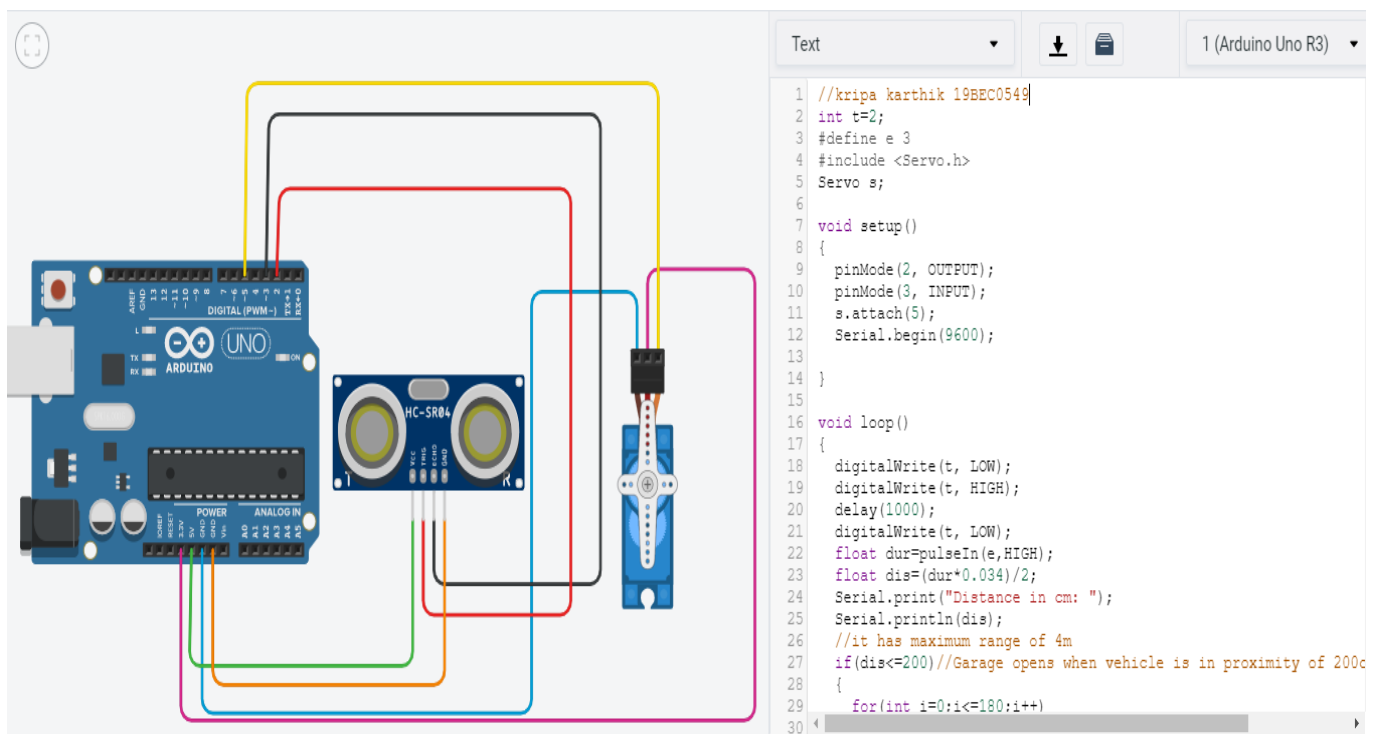
```
{
Serial.println("Vehicle not detected, Garage not opening");
}
delay(20);
}
```

SCREENSHOTS


```
1  //kripa karthik 19BEC0549
2  int t=2;
3  #define e 3
4  #include <Servo.h>
5  Servo s;
6
7  void setup()
8  {
9    pinMode(2, OUTPUT);
10   pinMode(3, INPUT);
11   s.attach(5);
12   Serial.begin(9600);
13
14 }
15
16 void loop()
17 {
18   digitalWrite(t, LOW);
19   digitalWrite(t, HIGH);
20   delay(1000);
21   digitalWrite(t, LOW);
22   float dur=pulseIn(e,HIGH);
23   float dis=(dur*0.034)/2;
24   Serial.print("Distance in cm: ");
25   Serial.println(dis);
26   //it has maximum range of 4m
27   if(dis<=200)//Garage opens when vehicle is in proximity of 200c
28   {
29     for(int i=0;i<=180;i++)
30
```

Top code panel:

```
18   digitalWrite(t, LOW);
19   digitalWrite(t, HIGH);
20   delay(1000);
21   digitalWrite(t, LOW);
22   float dur=pulseIn(e,HIGH);
23   float dis=(dur*0.034)/2;
24   Serial.print("Distance in cm: ");
25   Serial.println(dis);
26   //it has maximum range of 4m
27   if(dis<=200)//Garage opens when vehicle is in proximity of 200c
28   {
29     for(int i=0;i<=180;i++)
30     {
31       s.write(i);
32       delay(20);
33     }
34   delay(5000);
35   Serial.println("Garage closing");
36   for(int j=180;j>=0;j--)
37     {
38       s.write(j);
39       delay(15);
40     }
41   }
42   else
43   {
44     Serial.println("Vehicle not detected, Garage not opening");
45   }
46   delay(20);
47
```
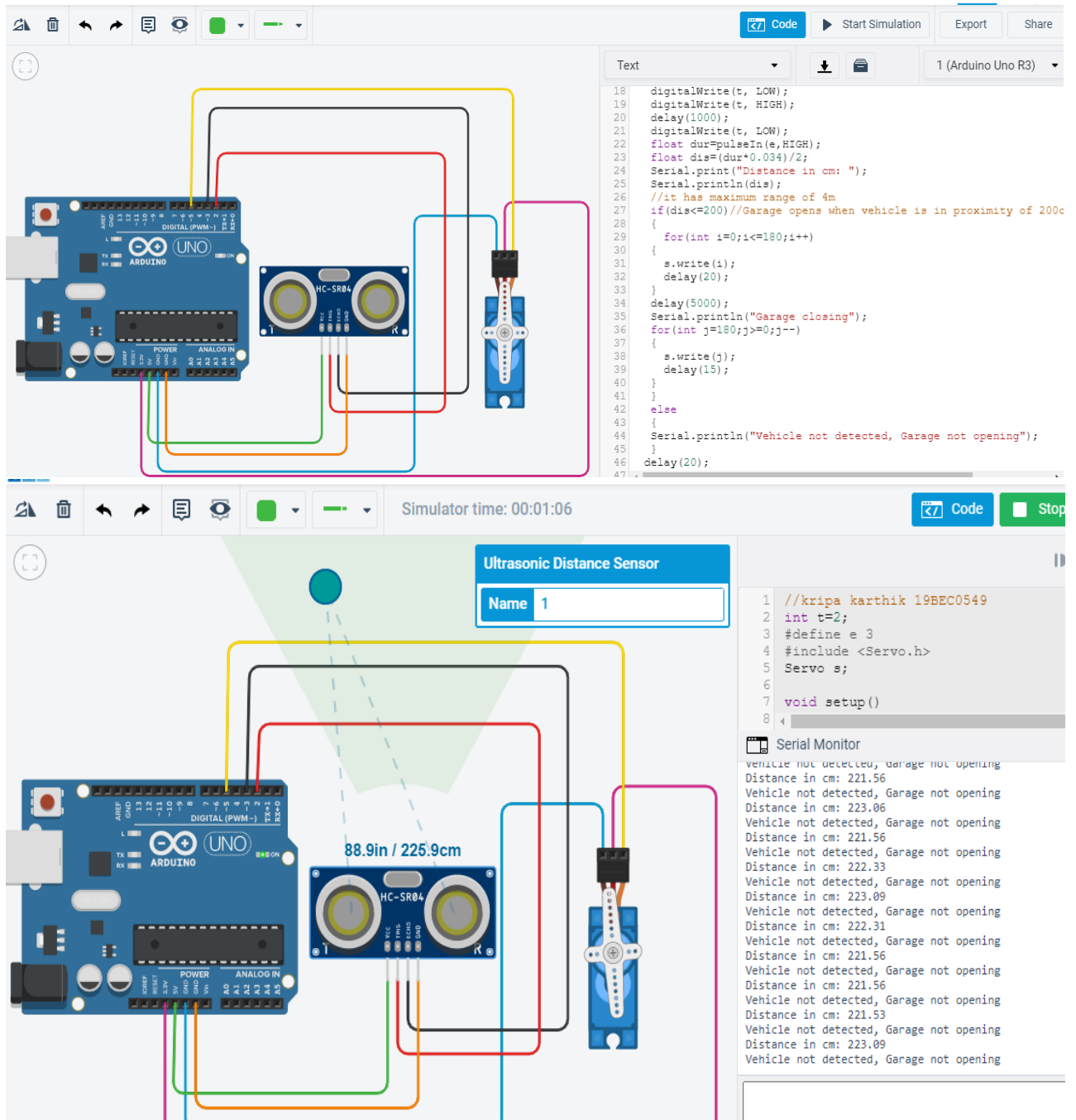
Bottom panel — Ultrasonic Distance Sensor, Name: 1, 88.9in / 225.9cm

```
1  //kripa karthik 19BEC0549
2  int t=2;
3  #define e 3
4  #include <Servo.h>
5  Servo s;
6
7  void setup()
8
```

Serial Monitor:

```
Vehicle not detected, Garage not opening
Distance in cm: 221.56
Vehicle not detected, Garage not opening
Distance in cm: 223.06
Vehicle not detected, Garage not opening
Distance in cm: 221.56
Vehicle not detected, Garage not opening
Distance in cm: 222.33
Vehicle not detected, Garage not opening
Distance in cm: 223.09
Vehicle not detected, Garage not opening
Distance in cm: 222.31
Vehicle not detected, Garage not opening
Distance in cm: 221.56
Vehicle not detected, Garage not opening
Distance in cm: 221.56
Vehicle not detected, Garage not opening
Distance in cm: 221.53
Vehicle not detected, Garage not opening
Distance in cm: 223.09
Vehicle not detected, Garage not opening
```

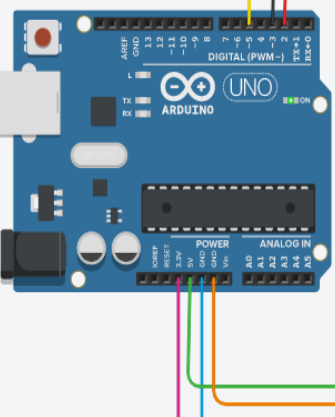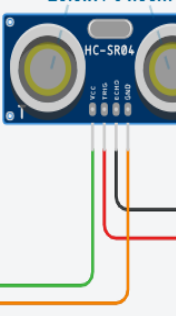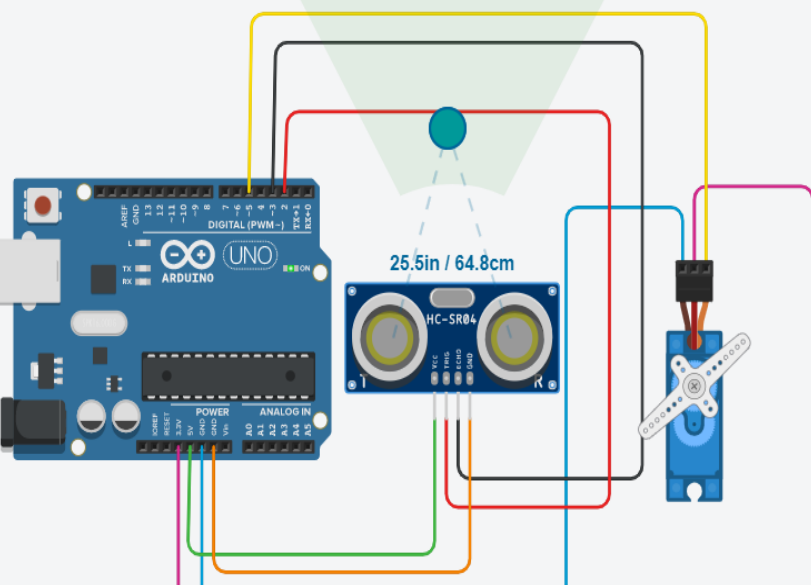**When the object is detected at distance greater than 200 the garage will be closed.**

When the object is detected at a distance less than 200 the garage opens and remains open for 5sec as we have given the delay like that and then closes

Simulator time: 00:01:54

Code Stop Simulatio

Ultrasonic Distance Sensor

Name 1

25.5in / 64.8cm

HC-SR04

ARDUINO UNO

```
1  //kripa karthik 19BEC0549
2  int t=2;
3  #define e 3
4  #include <Servo.h>
5  Servo s;
6
7  void setup()
8  {
9    pinMode(2, OUTPUT);
10   pinMode(3, INPUT);
11   s.attach(5);
12   Serial.begin(9600);
13
14 }
15
16 void loop()
17 {
18   digitalWrite(t, LOW);
19
```

Serial Monitor

Distance in cm: 223.06
Vehicle not detected, Garage not opening
Distance in cm: 63.92
Garage closing
Distance in cm: 63.92
Garage closing
Distance in cm: 62.39
Garage closing