Assignment – 2

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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. Jumper Wires
5. Resistor

Working - We use an ultrasonic sensor to detect the distance to vehicle from the garage. Based on the distance if the vehicle is 300cm = 3 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 30 seconds and then automatically close.

Circuit Diagram –
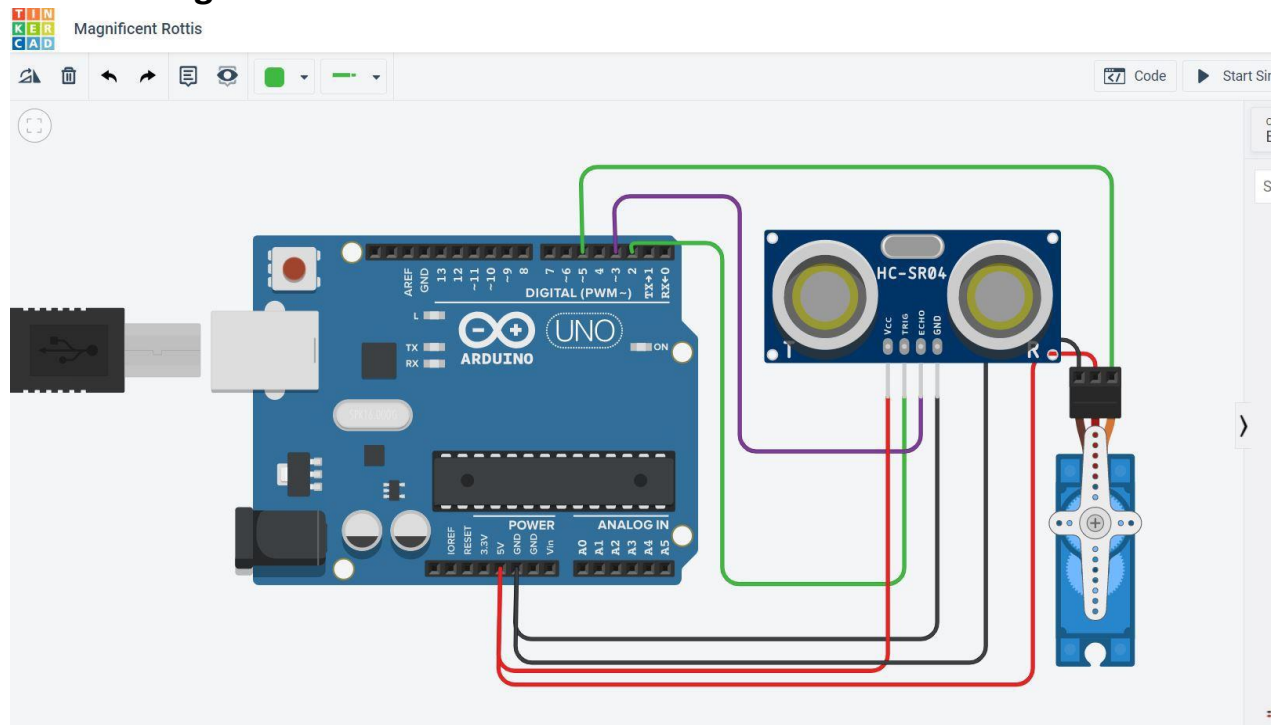
Arduino Code –

```cpp
#include<Servo.h>
Servo s;
void setup()
{
pinMode(2, OUTPUT);
pinMode(3,INPUT);
s.attach(5);
Serial.begin(9600);
s.write(0);
}
void loop()
{
  digitalWrite(2, LOW);
digitalWrite(2, HIGH);
delayMicroseconds(10);
digitalWrite(2,LOW);
float dur=pulseIn(3,HIGH);
float dis = (dur * 0.0343)/2;
if(dis<=300)
{
Serial.println("Door Opening");
for(int i=0;i<=180;i++)
{
s.write(i);
delay(100);
}
delay(30000);
Serial.println("Door Closing");
for(int j=180;j>=0;j--)
{
s.write(j);
delay(100);
}
}
 }
```

Output –

The Tinkercad simulation interface titled "Magnificent Rottis" showing an Arduino Uno connected to an HC-SR04 ultrasonic sensor and a servo motor, with the following code:

```cpp
#include<Servo.h>
Servo s;
void setup()
{
  pinMode(2, OUTPUT);
  pinMode(3,INPUT);
  s.attach(5);
  Serial.begin(9600);
  s.write(0);
}

void loop()
{
  digitalWrite(2, LOW);

  digitalWrite(2, HIGH);
  delayMicroseconds(10);
  digitalWrite(2,LOW);
  float dur=pulseIn(3,HIGH);
  float dis = (dur * 0.0343)/2;
  if(dis<=300)
  {
    Serial.println("Door Opening");
    for(int i=0;i<=180;i++)
    {
```

Serial Monitor output:

```
Door Opening
Door Closing
Door Opening
Door Closing
```