

Project Topic- "Distance detector in Covid 19 situation"

"Lab Project"

Tinkercad Simulation link: Click here

"Distance Sensor in Covid 19 situation"

Purpose of this project:

We want to create a distance sensor among objects. It will help people during this pandemic situation. As we all are instructed to maintain a minimum safe distance of 6 feet from each other. But few ignorant people don't follow this rule. In this situation if our distance sensor measures the distance among people and the distance is much closer between people then it will turn on the buzzer, make a sound out of it and it will alert the people. And people will maintain a safe distance from each other.

Equipment:

1. Tinkercad Online circuit simulator
2. Arduino UNO R3
3. NeoPixel Ring 12 LED
4. Ultrasonic Distance Sensor
5. Breadboard
6. Piezo Buzzer
7. Wire

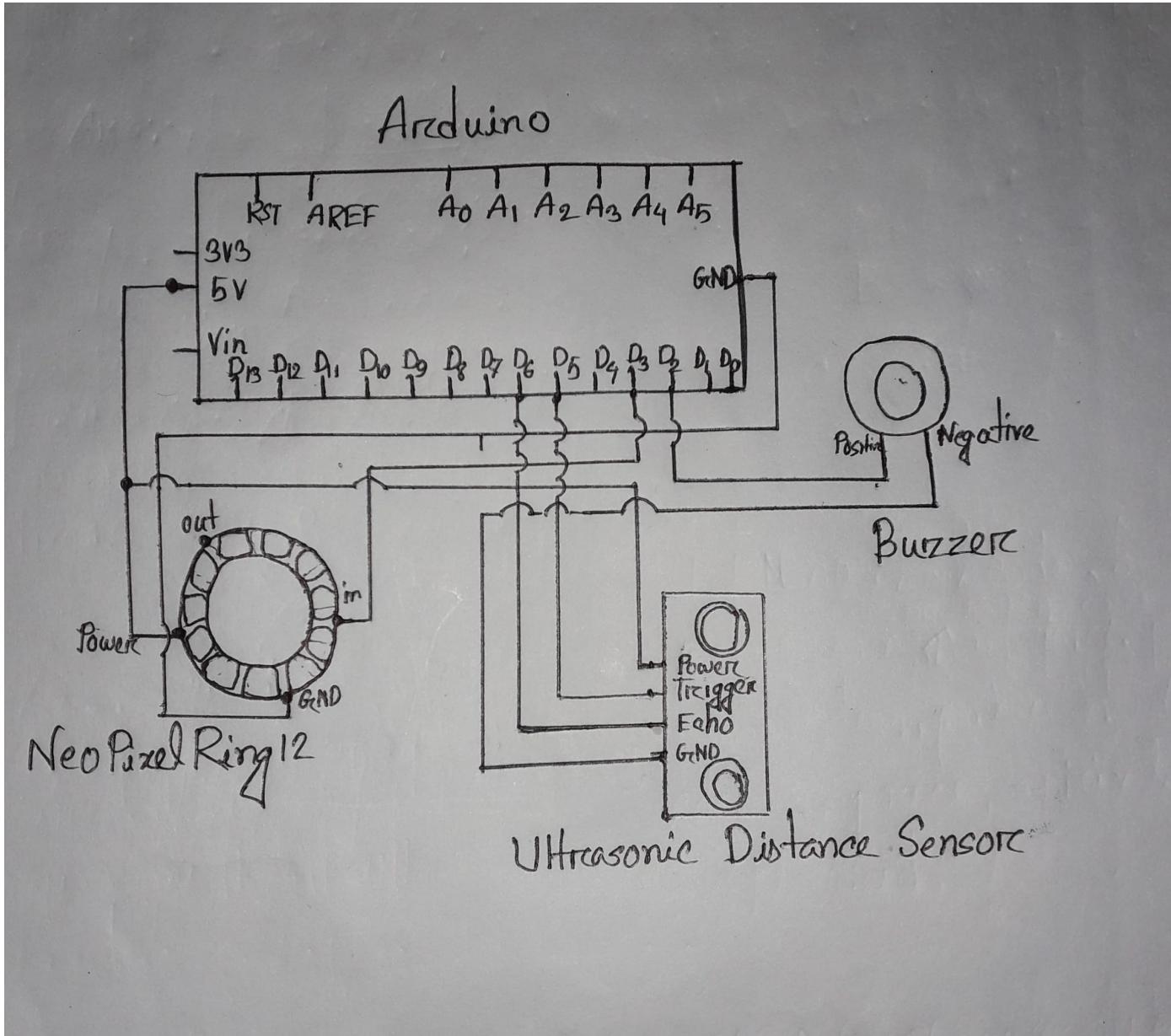
Description:

Arduino UNO R3: Arduino is an open source electronic circuit .In our project we use it as alternatives of other hardware devices. By using it we can get our desired voltage and it can read input and turn them into output.

Ultrasonic Distance Sensor: It creates an ultrasound which can travel through the air and when it detects an obstacle or object on its path then it considers the travel time and speed and then calculates the distance.So we use it to measure distance between our device and another person within 6 feet. Here the sensor works as a distance calculator and it is also an input device in our circuit.

NeoPixel Ring 12 LED: In a neopixel ring there are 12 ultra bright led lights arranged in a circle. According to our voltage variation we fixed three colors green,yellow and red. And it works as output.

Piezo Buzzer:It is our output. When our device detects any person within 6 feet then the buzzer will turn on and it makes a sound to alert us so that we can maintain our social distance perfectly.

Circuit Diagram:**Figure: Circuit Diagram**

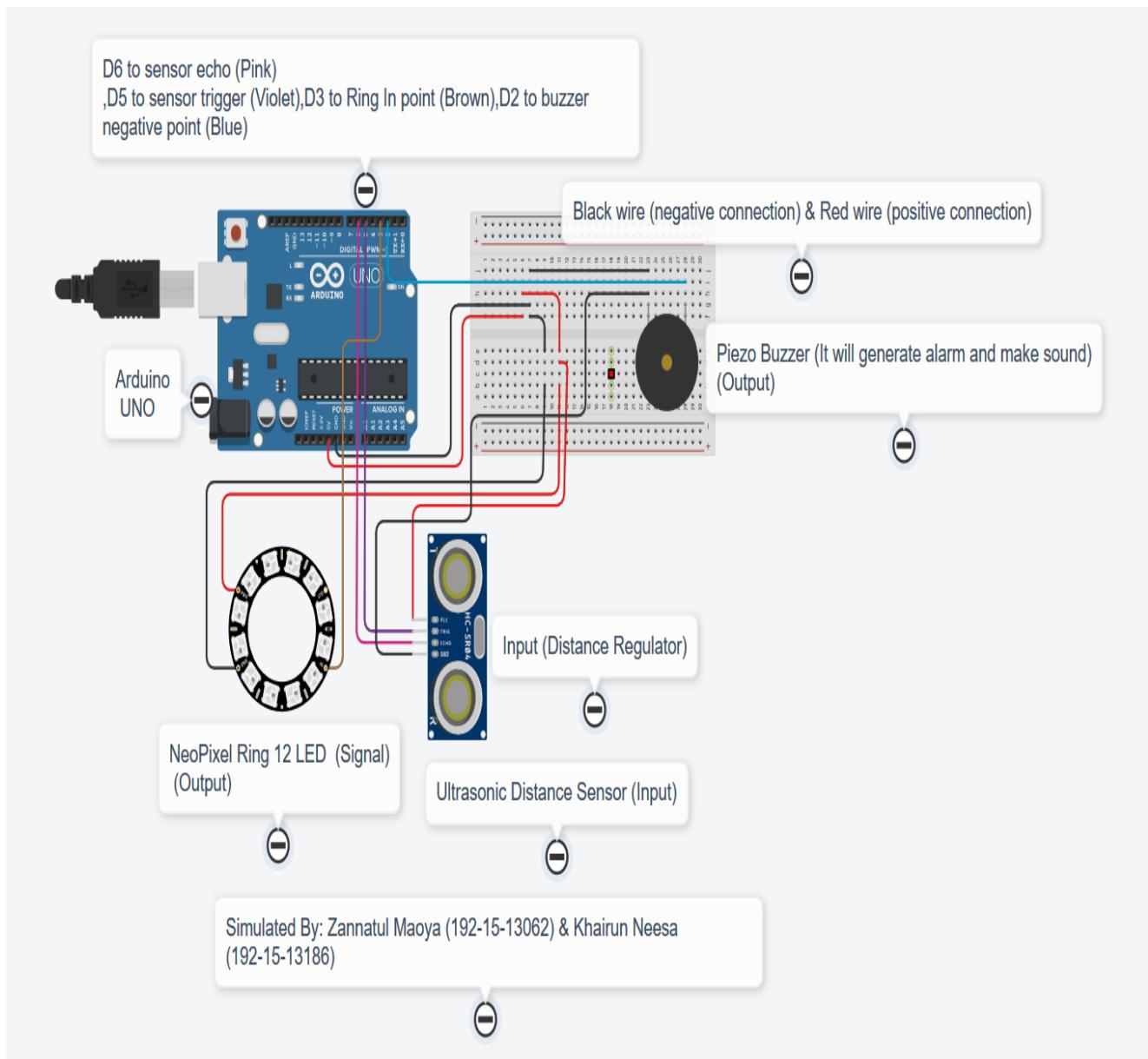


Figure: Circuit diagram in tinkercad

Procedure:

1. Opened a tinkerCAD simulator. Took all the components (Arduino UNO R3, NeoPixel Ring 12 LED, Ultrasonic Distance Sensor, Breadboard, Piezo Buzzer from the component section.
2. Gave connection wire in breadboard. Red wire indicates positive connection and black wire indicates negative connection. Placed the buzzer on the breadboard.
3. Pulled positive wire and negative wire from the breadboard and connected it respectively to arduino positive connection (+5v point) and ground.
4. Pulled positive wire and negative wire from the breadboard and connected it respectively to the neopixel ring power and ground.
5. Pulled positive wire from the breadboard and connected it to the Ultrasonic Distance Sensor power (Vcc) and negative point connected to buzzer negative point.
6. Connected Arduino D3 to Neopixel ring in point, Arduino D5 to sensor trigger point, Arduino D6 to sensor echo point and Arduino D2 to buzzer positive point.

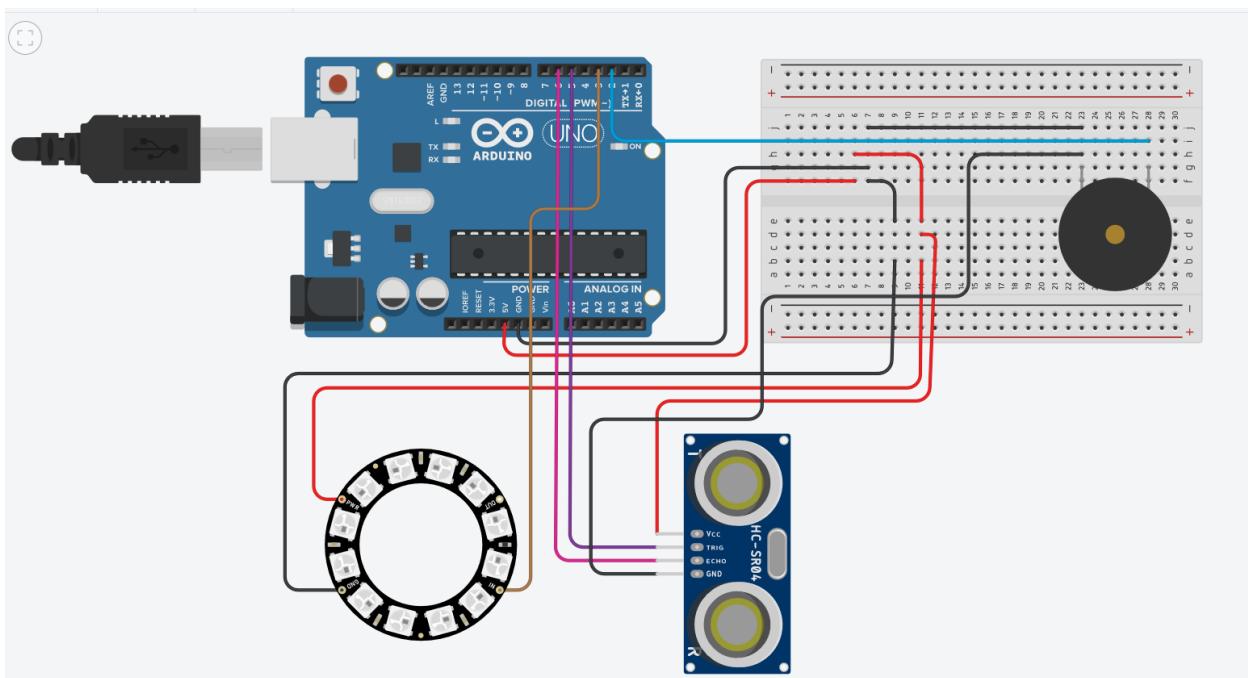
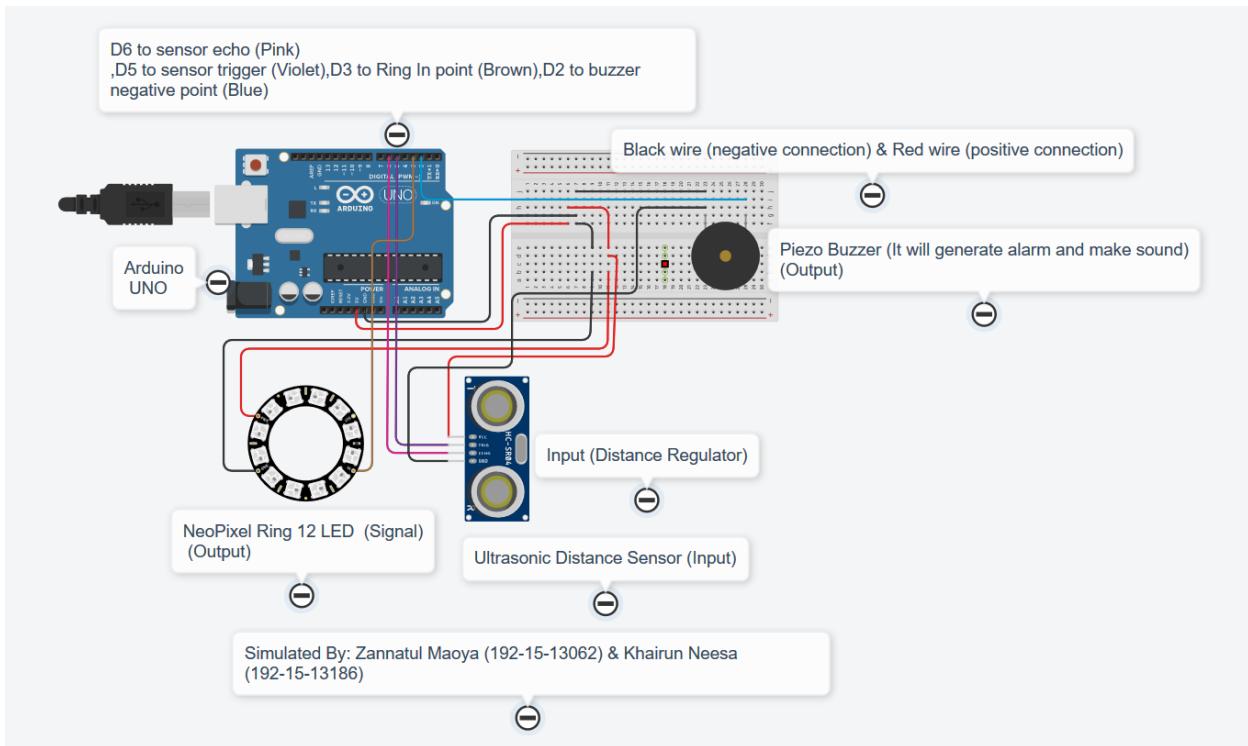
Advantages:

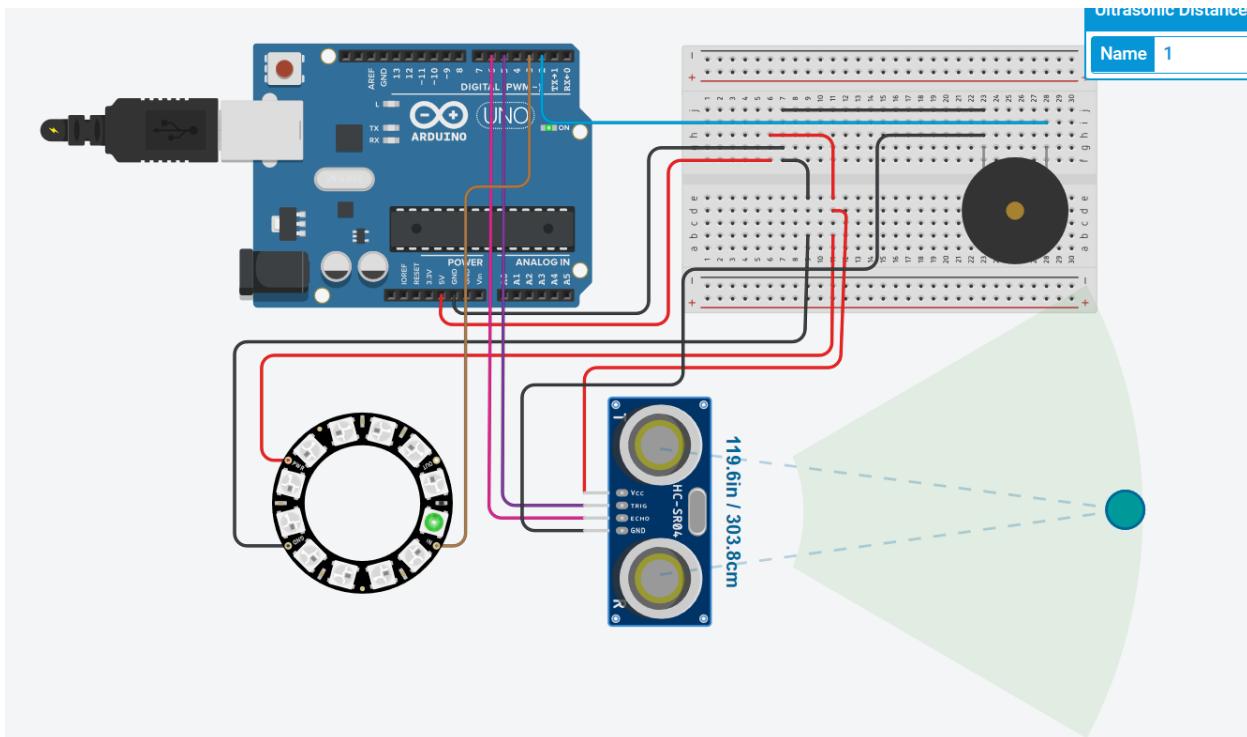
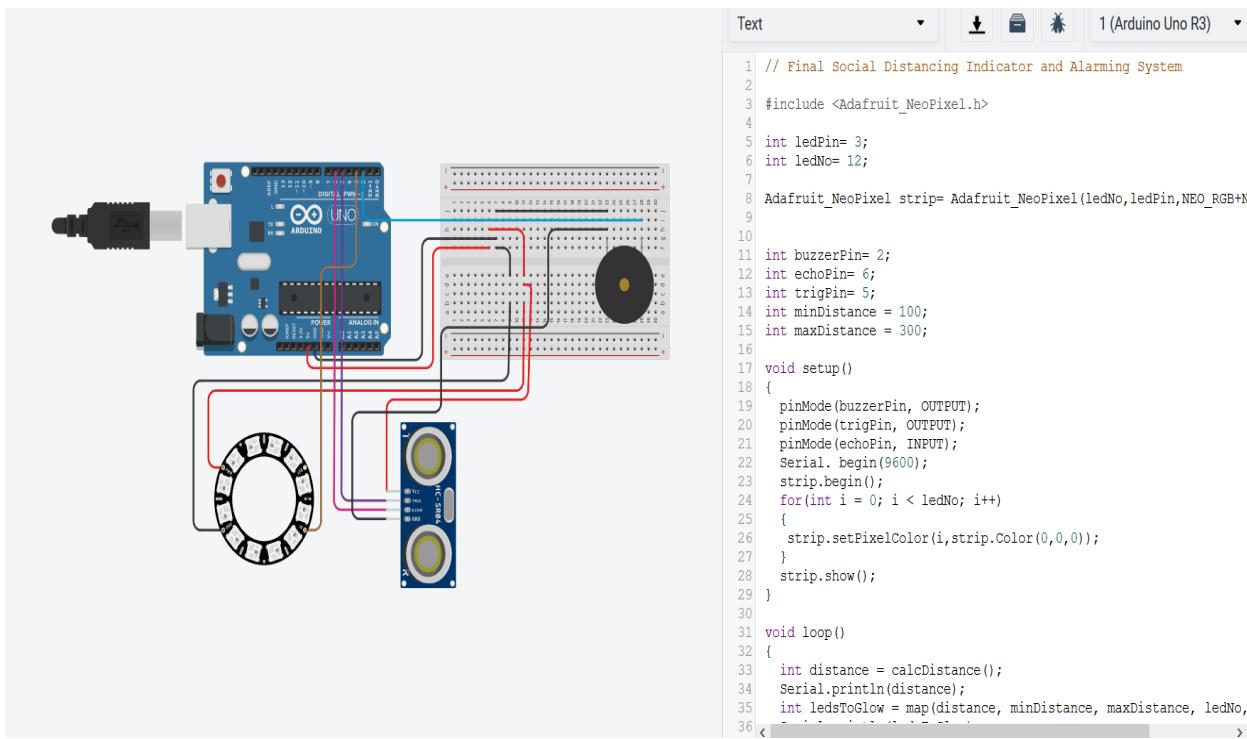
1. It will ensure safe distance among people.
2. People will have less chance of getting covid positive.
3. This device can be installed in any place.

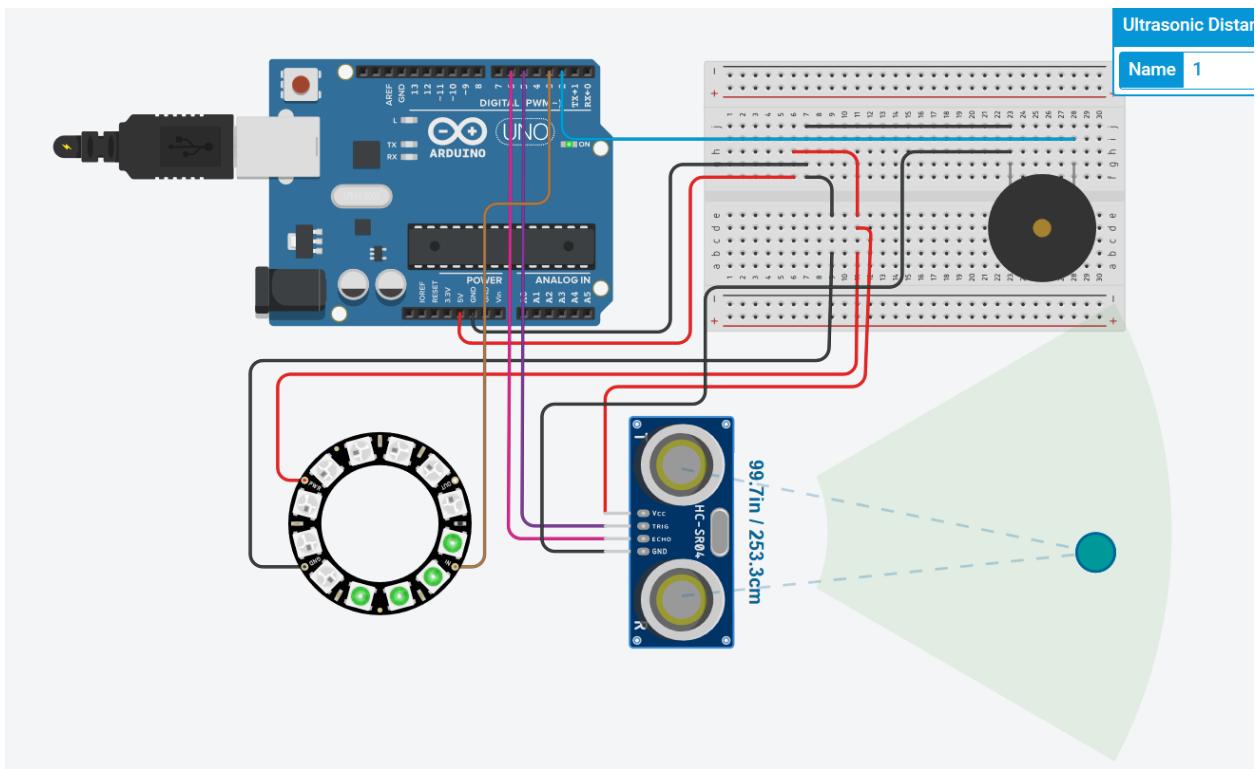
Disadvantages:

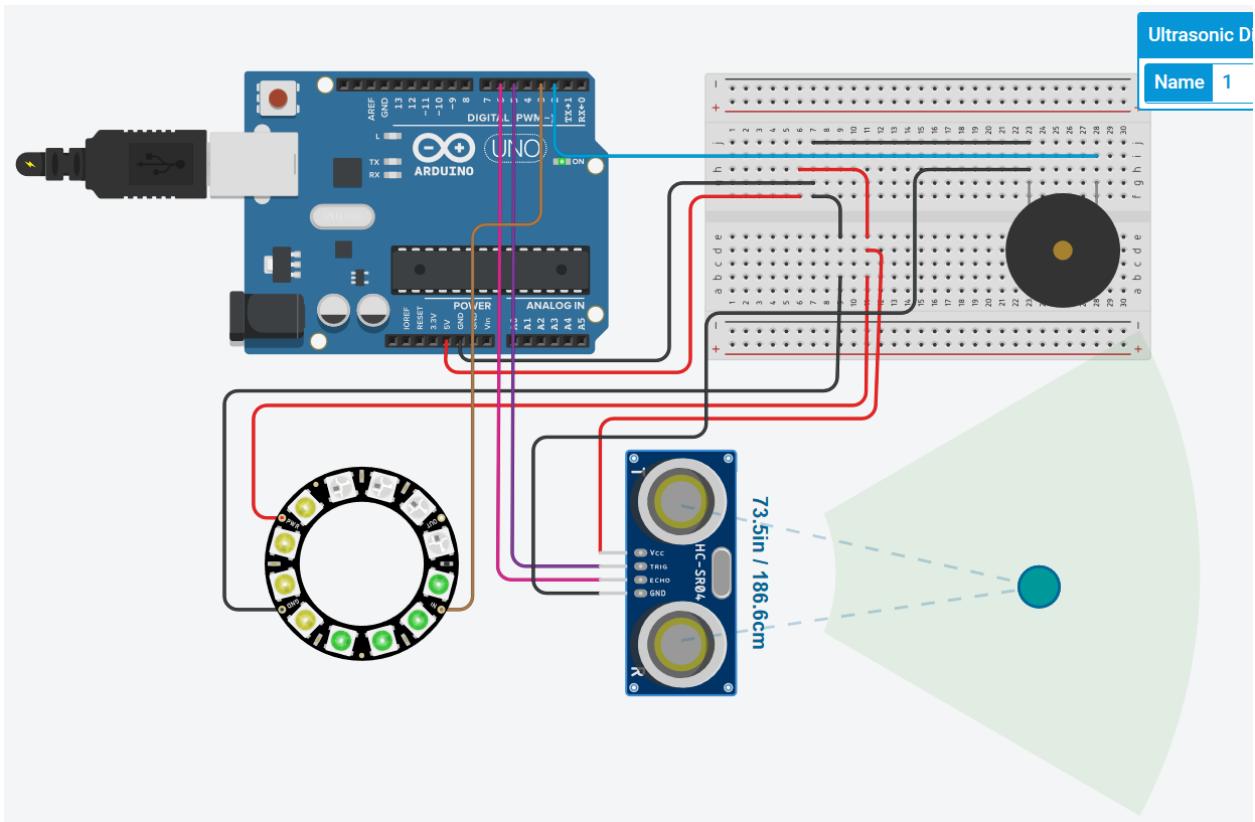
1. As we have only implemented it in a simulator we don't know its drawback and effectiveness as hardware or machine.
2. Clueless about its cost effectiveness and don't know if it is feasible to this situation or not.

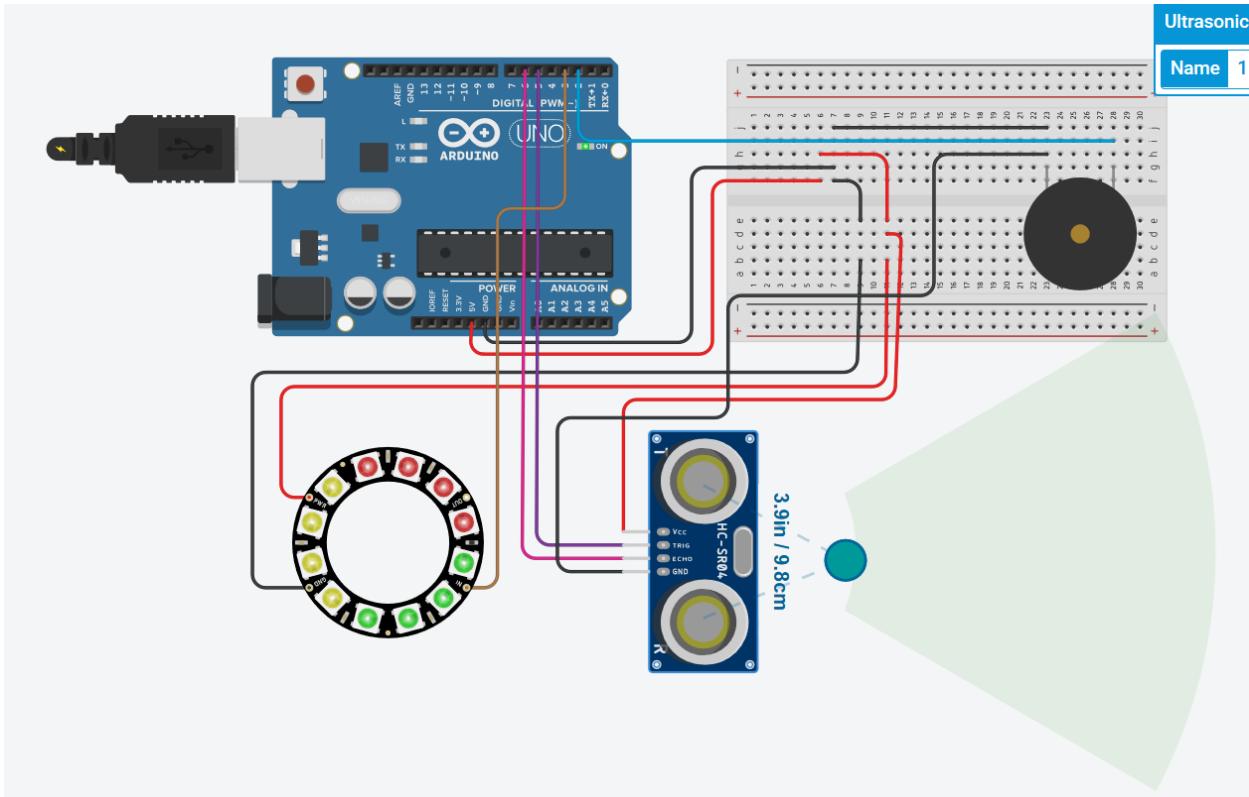
Project ScreenShot:











Simulated code:

```
// Social Distancing Indicator and Alarming System

#include <Adafruit_NeoPixel.h>

int ledPin= 3;
int ledNo= 12;
Adafruit_NeoPixel strip= Adafruit_NeoPixel(ledNo,ledPin,NEO_RGB+NEO_KHZ800);
int buzzerPin= 2;
int echoPin= 6;
int trigPin= 5;
int minDistance = 100;
int maxDistance = 300;
void setup()
```

```
{  
    pinMode(buzzerPin, OUTPUT);  
    pinMode(trigPin, OUTPUT);  
    pinMode(echoPin, INPUT);  
    Serial.begin(9600);  
    strip.begin();  
    for(int i = 0; i < ledNo; i++)  
    {  
        strip.setPixelColor(i,strip.Color(0,0,0));  
    }  
    strip.show();  
}  
  
void loop()  
{  
    int distance = calcDistance();  
    Serial.println(distance);  
    int ledsToGlow = map(distance, minDistance, maxDistance, ledNo, 1);  
    Serial.println(ledsToGlow);  
    if(ledsToGlow == 12)  
    {  
        digitalWrite(buzzerPin, HIGH);  
    }  
    else  
    {  
        digitalWrite(buzzerPin, LOW);  
    }  
    for(int i = 0; i < ledsToGlow; i++)
```

```
{  
if(i < 4)  
{  
    strip.setPixelColor(i,strip.Color(50,0,0));//green,red,blue  
}  
else if(i >= 4 && i < 8)  
{  
    strip.setPixelColor(i,strip.Color(50,50,0));//green,red,blue  
}  
else if(i >= 8 && i < 12)  
{  
    strip.setPixelColor(i,strip.Color(0,50,0));//green,red,blue  
}  
}  
for(int i = ledsToGlow; i < ledNo; i++)  
{  
    strip.setPixelColor(i,strip.Color(0,0,0));  
}  
strip.show();  
delay(50);  
}  
int calcDistance()  
{  
    long distance,duration;  
    digitalWrite(trigPin, LOW);  
    delayMicroseconds(2);  
    digitalWrite(trigPin, HIGH);
```

```
delayMicroseconds(10);

digitalWrite(trigPin, LOW);

duration = pulseIn(echoPin, HIGH);

distance = duration/29/2;

if(distance >= maxDistance)

{

distance = maxDistance;

}

if(distance <= minDistance)

{

distance = minDistance;

}

return distance;

}
```

Thank You