COVID-19 Detection in human beings using tinkercad

prepard by,

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Introduction:

Coronaviruses are a large family of viruses that are known to cause illness ranging from the common cold to more severe diseases such as Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS).A novel coronavirus (COVID-19) was identified in 2019 in Wuhan, China.

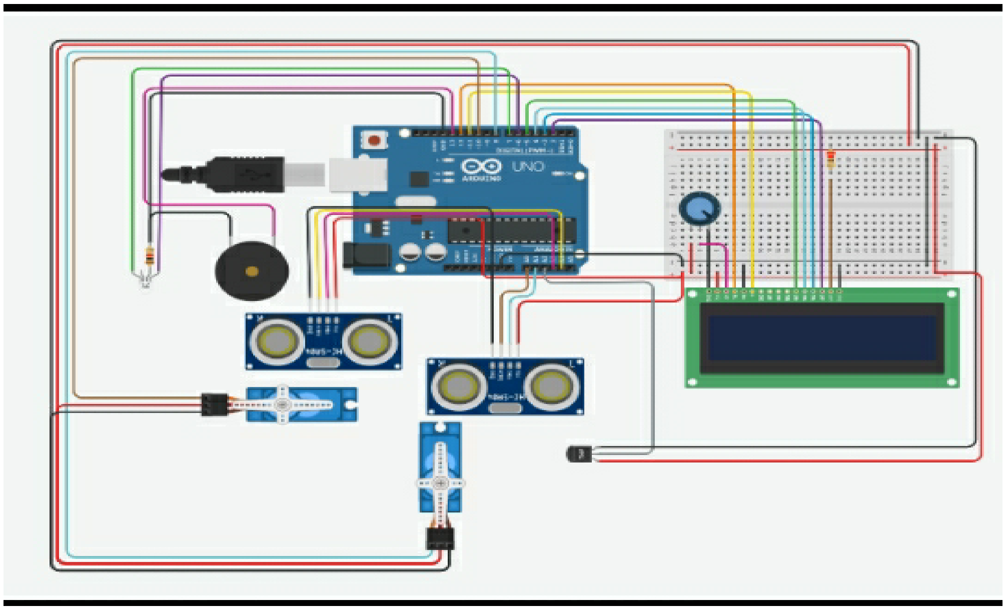
Along with laboratory testing, chest CT scans may be helpful to diagnose COVID-19 in individuals with a high clinical suspicion of infection.In this project we detect covid 19 dieses .

Idea describtion:

In this project we are creating a **COVID- 19 Human Detector** using Arduino, 16x2 LCD, Potentiometer,Ultrasonic Sensor & Buzzer in Tinkercad. The Ultrasonic sensor or Passive Ultrasonic Sensor is a digital sensor which detects the movement of Ultrasonic sound wave from Humans & Animals. If any ultrasonic sound wave is detected by the Ultrasonic sensor then the buzzer will beep and it shows the status on LCD that there is any human or not.

So, by using this circuit you can create an automated sanitize chamber or a machine to detect that there is any human or not from 7-8 m of distance. So, let’s get started by gathering the components for this project in Tinkercad.

Circuit daigram:



Step 1: Components and Tool

You will need the following components and tools for creating this **COVID- 19**

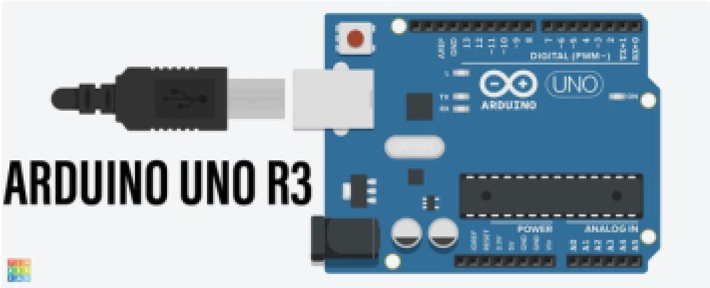
Human Detector Component

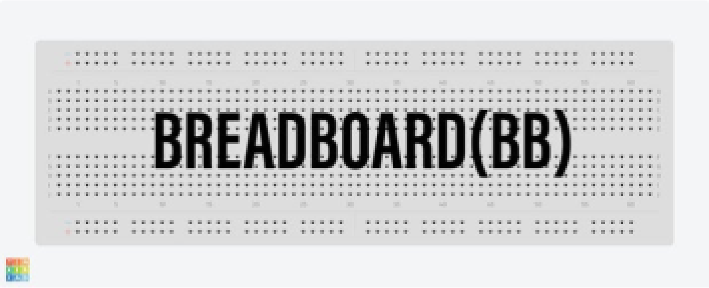
1. Arudiuno UNO R3,
2. Breadboard (BB),
3. 16x2 LCD,
4. 1k ohm Resistor,
5. 250 k ohm Potentiometer,

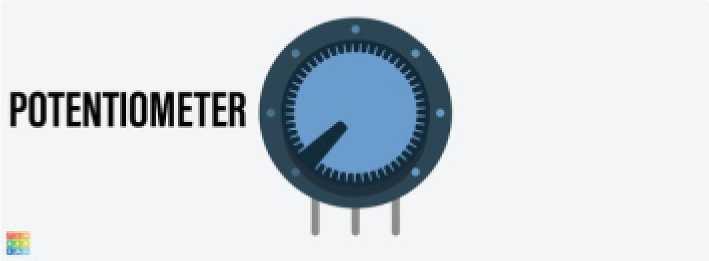
6. Ultrasonic sensor,
7. Buzzer.

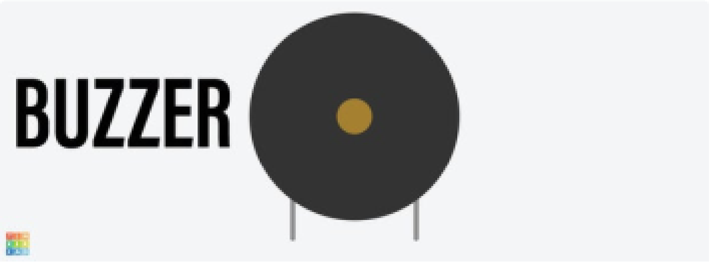
Tools

1. Tinkercad



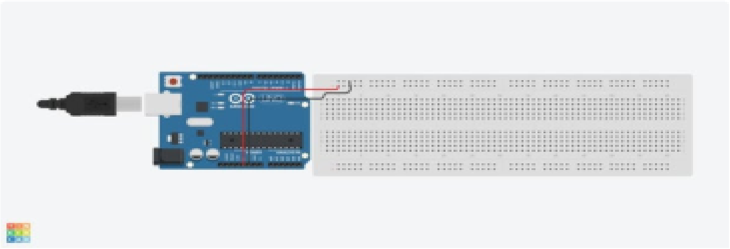






Step 2: Setting Up the Circuit (Give Power to the BreadBoard From Arduino)

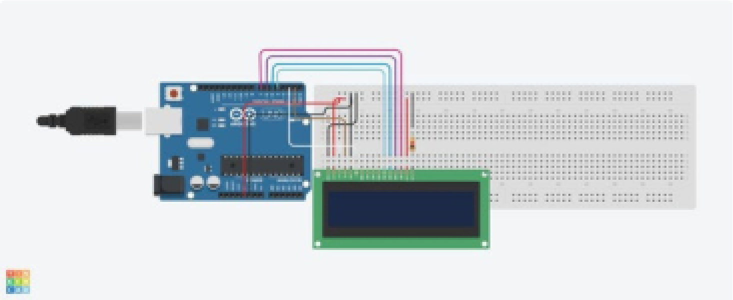
After gathering all the components in Tinkercad this time to wiring the circuit by interfacing with each other. So, first of all, we are giving a common +5v and GND connection on the breadboard rail as shown in the image.



Step 3: Interface 16x2 LCD With Arduino

After completing the above step this time to interfacing a 16x2 LCD with Arduino. So, for this follow the following connections and above schematic-

1. GND pin (LCD) --> GND rail (Breadboard),
2. Power pin (LCD) --> +5v rail (Breadboard),
3. LED Cathode pin (LCD) --> GND rail (Breadboard) with 1k ohm resistor,
4. LED Anode pin (LCD) --> +5v rail (Breadboard),
5. Read/Write pin (LCD) --> GND rail (Breadboard),
6. RS pin (LCD) --> Digital pin 1 (Arduino),
7. Enable pin (LCD) --> Digital pin 2 (Arduino),
8. DB4 (LCD) --> Digital pin 4 (Arduino),
9. DB5 (LCD) --> Digital pin 5 (Arduino),
10. DB6 (LCD) --> Digital pin 6 (Arduino),
11. DB7 (LCD) --> Digital pin 7 (Arduino).

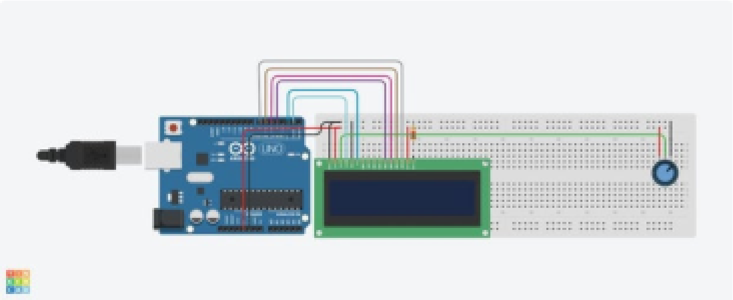


Step 4: Interface Potentiometer With 16x2 LCD

After interfacing LCD with Arduino this time to interfacing potentiometer with LCD for the LCD contrast. So, for this

see the following connection with LCD -

1. Terminal 1 (Potentiometer) --> +5v rail (Breadboard),
2. Terminal 2 (Potentiometer) --> GND rail (Breadboard),
3. Wiper pin (Potentiometer) --> Contrast pin (LCD).



Step 5: Interface Ultrasonic Sensor With Arduino

Place your Ultrasonic sensor on the breadboard and connect it with Arduino with the following Connections:

1. GND pin --> GND rail (BreadBoard),
2. Power Pin--> +5v rail (BreadBoard),
3. Signal Pin --> Digital pin 13 (Arduino).

Step 6: Interface Buzzer With Arduino and Complete Your Circuit

When the human detected so for this, we are using a buzzer for beeping. Interface the buzzer using the following connection

1. Positive pin (Buzzer) --> Digital pin 9 (Arduino),
2. Negative Pin (Buzzer) --> Ground pin (Arduino).

After interfacing all the components your circuit has been completed for Covid-19 Human Detector .

Step 7: Writing the Code (Include the Required Libraries)

Now, we will write our **COVID- 19 Human Detector** Code. So, in this lesson, you will learn to write code that connects the LCD, PIR sensor, Buzzer and Arduino with each other

So, first of all, in our program, we will include the required libraries. So, here we are importing the LCD library with the following command

```
#include <LiquidCrystal.h>
```

Step 8: Create a LCD Object

After that create an LCD object using LiquidCrystal() function to define the RS, EN, D4, D5, D6, D7 pin no. The code is following for defining the pins

```
LiquidCrystal lcd (1,2,4,5,6,7);
```

Step 9: Define the Global Variables

So, after importing the required libraries and creating the object next step to define all global variables for sensor and buzzer with the following code

```
int pir_sensor =13;

int pir_reader;

int buzzer = 9;
```

Step 10: Configure the Void Setup Function ()

In void setup function we define only those functions which we want to execute only one time when the program is started. So in the void setup, we are writing the following lines of code

```
pinMode(13,INPUT);// For set the PIR signal pin as input mode

pinMode(buzzer,OUTPUT);// For set the Buzzer pin as OUTPUT mode

lcd.begin(16,2); //Start the 16x2 LCD lcd.setCursor(4,0);// Set the LCD Cursor using


lcd.setCursor

lcd.print("COVID-19");//Print the message on LCD lcd.setCursor(2,1); //Again set

the LCD cursor

lcd.print("HUMAN DETECTOR"); //Again print the another message on different
line

delay(2000); //Set the delay lcd.clear(); // clear the LCD
```

Step 11: Configure the Void Loop Function:

This is a loop function of Arduino where we define all the functions and actions which we want to run in a loop. So, in this function, we write the following lines of code

```
pir_reader = digitalRead(pir_sensor); // Read the pir sensor using digitalRead function

if (pir_reader ==1){//Use the if – else condition to trigger the action when the input is
high

digitalWrite(buzzer,HIGH); //Set the pin HIGH of Buzze lcd.setCursor(4,0); //Set the cursor

of LCD lcd.print("There is"); //Print the message on LCD lcd.clear(); //Clear the LCD

lcd.setCursor(4,1); //Set the cursor of LCD
lcd.print(" Human"); //Print the message on LCD

}

else{ //use the else condition digitalWrite(buzzer,LOW); //Set the pin low of Buzzer

lcd.clear(); //Clear the LCD

lcd.setCursor(4,0); //Set the cursor of LCD lcd.print("There is"); //Print the message

on LCD lcd.setCursor(4,1); //Set the cursor of LCD lcd.print("No Human"); //Print the

message on LCD delay(500); //Give a delay
```

Step 12: Test the Circuit

Now test the circuit of Covid-19 Human Detector by click on Start Simulation

Button. See the above video. Some Important points about this Circuit in Real World:

1. After powering it will take a maximum of 60 seconds for initialization,
2. This will take 5-6 seconds for reading another entry,
3. In the sunniest area, this sensor will not work properly,
4. You can increase/decrease the sensitivity and time by using its inbuilt pots.

Step 13: Other Projects by Using This Circuit:

The other project ideas you can make by using only this COVID-19 Human Detector but with some modification of code:

1. Automated Sanitize Chamber,
2. Thief Detector.

So, think about these above projects and make your own.

Project code:

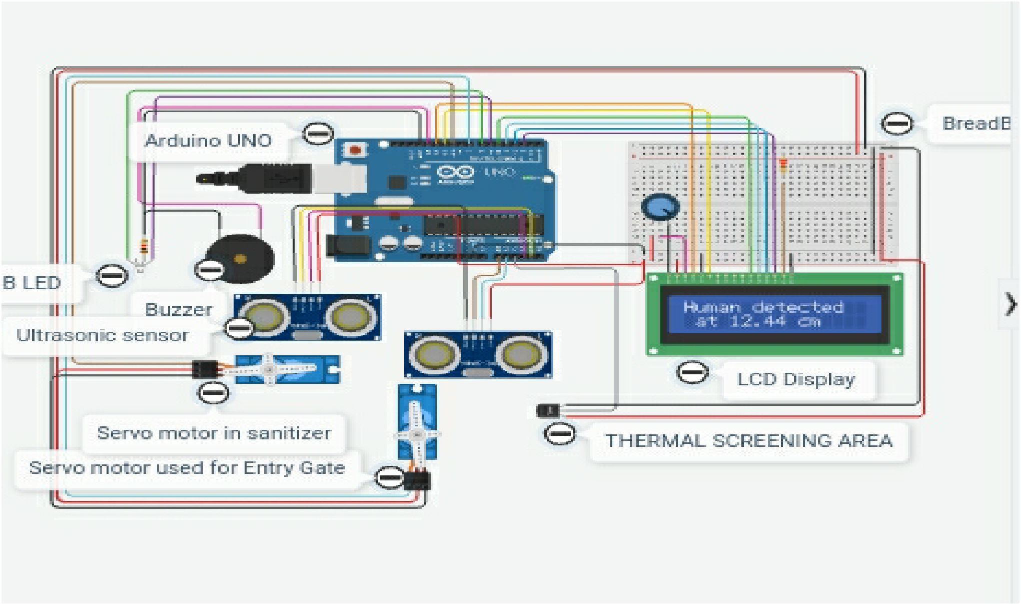
```
#include <LiquidCrystal.h>  // to Include LiquidCrystal Library
#include <Servo.h>          //to Include servo library

LiquidCrystal lcd(12, 11, 5, 4, 3, 2); //the numbers are the port numbers that are connected to the
pins on the LCD from left to right (LCD is right-side-up).
Servo enter;  //  Creating Object
Servo senitizer;  //  Creating Object

//Declaring and Initializing the all variables

int Temp;
float volts;
float celcius;
float fahrenheit;

int trigPin = A1;
int echoPin = A0;
float duration;
float distance;

int newtrigPin = A3;
int newechoPin = A4;
float newduration;
float newdistance;

int Red = 6;
int Green = 7;
int Alarm =13;

int tmp = A2;

int counting = 0;
int i = 0;
int j = 0;
int k = 0;
int a = 0;
int b = 0;


void setup()
```

```
{
    pinMode(Temp, INPUT);  // pin no and mode
            pinMode(Red, OUTPUT);
            pinMode(Green, OUTPUT);
            pinMode(Alarm, OUTPUT);
            pinMode(trigPin, OUTPUT);
            pinMode(echoPin, INPUT);
    pinMode(newtrigPin, OUTPUT);
            pinMode(newechoPin, INPUT);
            Serial.begin(9600);
            lcd.begin(16, 2);
    enter.attach(8);
    enter.write(0);
    senitizer.attach(10);
    senitizer.write(0);

}

void loop()
{

  digitalWrite(newtrigPin, LOW);
  delayMicroseconds(2);
  digitalWrite(newtrigPin, HIGH);
  delayMicroseconds(10);
  digitalWrite(newtrigPin, LOW);
  newduration = pulseIn(newechoPin,HIGH);
  newdistance = ((newduration*0.034)/2);
  if(newdistance <= 15 && k==0)
    {
      k = 1;
      senitizer.write(90);
      delay(1000);
      senitizer.write(0);
      delay(1000);
    }
  if(newdistance>15)
    {
      k = 0;
    }

  digitalWrite(trigPin, LOW);
  delay(2);
  digitalWrite(trigPin, HIGH);
  delay(10);
  digitalWrite(trigPin, LOW);
  duration = pulseIn(echoPin,HIGH);
  distance= duration*0.034/2;

  if (distance <= 20 && distance >= 10)
     {

         a=0;
         if(b==0)
          {
```

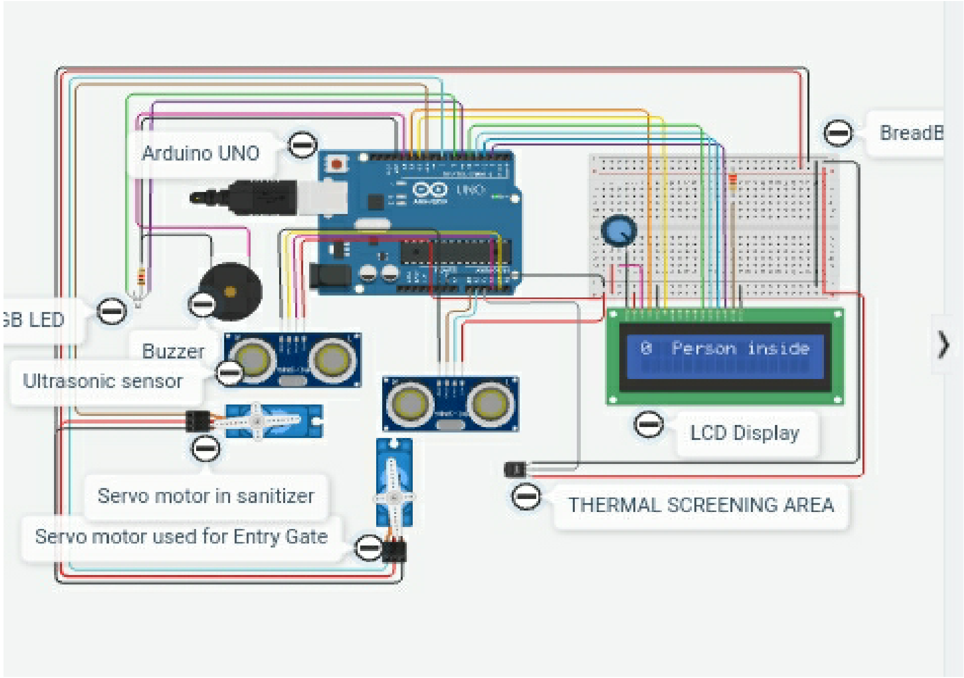
```
   lcd.clear();
                    lcd.print("Human detected");Serial.print("Human detected at ");
                    Serial.print(distance,2);Serial.print(" cm \n");
   lcd.setCursor(0, 1);
            lcd.print(" at "); lcd.print(distance,2); lcd.print(" cm ");
   delay(2000);
   lcd.clear();
            lcd.setCursor(0, 0);
            lcd.print(counting);
            lcd.setCursor(2, 0);
            lcd.print(" Person inside");
   Serial.print(counting);
   Serial.println(" Person inside");
            delay(2000);
   b=1;
}

Temp = analogRead(A2);
volts = (Temp / 965.0) * 5;
celcius = (volts - 0.5) * 100;
fahrenheit = (celcius * 9 / 5 + 32);

if(fahrenheit > 98.6)
 {
   enter.write(0);
   digitalWrite(Green,LOW);
   digitalWrite(Red,HIGH);
   tone(Alarm,200);
   lcd.setCursor(0, 0);
   lcd.print("Temp. is ");lcd.print(fahrenheit,1);
   lcd.setCursor(0, 1);
   lcd.print(" i.e. not Normal  ");
   Serial.print("Temp. is ");Serial.print(fahrenheit,1);
   Serial.println(" degree F, i.e. not Normal ");
   delay(2000);
   i=0;
 }

else
 {
   if(i==0)
    {
            noTone(Alarm);
                              digitalWrite(Red,LOW);
                              digitalWrite(Green,HIGH);

       if(counting<4)
       {
              enter.write(90);
        counting++;
       }
       else
       {
                                        lcd.setCursor(0, 1);
                                        lcd.print("No more entry");
```

```
                                      Serial.println("No more entry");
           }
                               delay(2000);
                               lcd.clear();
                               lcd.setCursor(0, 0);
                               lcd.print("Temp. is ");lcd.print(fahrenheit,2);
                               lcd.setCursor(0, 1);
                               lcd.print("Normal Temp.        ");
                               Serial.print("Temp. is ");Serial.print(fahrenheit);
                               Serial.println("  degree F , Normal Temp.        ");
                               delay(2000);
                               i=1;
                       }
               }
         }

  else
        {
        digitalWrite(Green,LOW);
        digitalWrite(Red,LOW);
    enter.write(0);
               noTone(Alarm);
    if(a==0)
    {
               Serial.println("\n No Human detected \n");
               lcd.clear();
               lcd.setCursor(0, 0);
               lcd.print("No Human ");
               lcd.setCursor(0, 1);
               lcd.print("detected ");
               i=0; j=0; b=0;
      a=1;
    }
  }
}
```

Output:



```
Human detected
 at 12.44 cm
```



```
0 Person inside
```