ASSIGNMENT

On

OFFICE CARE TINKERCAD DESIGN

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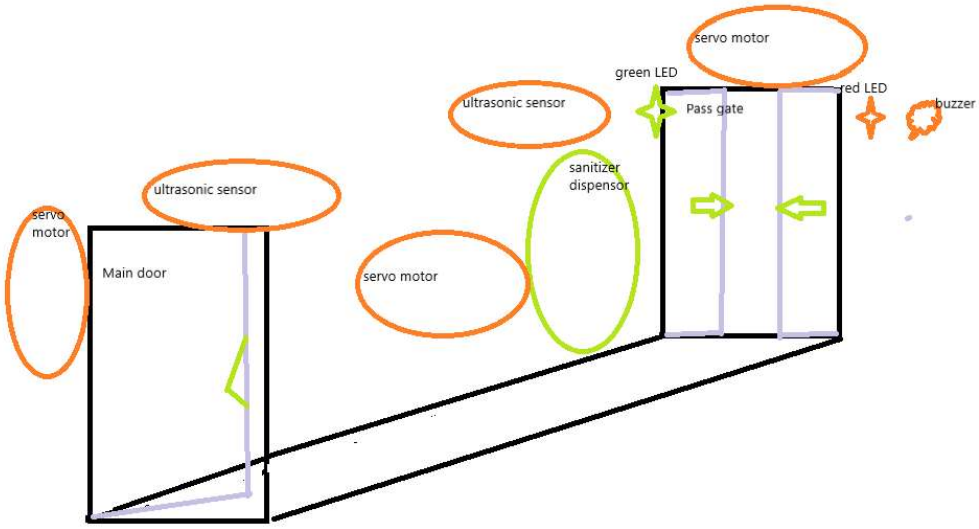
Description

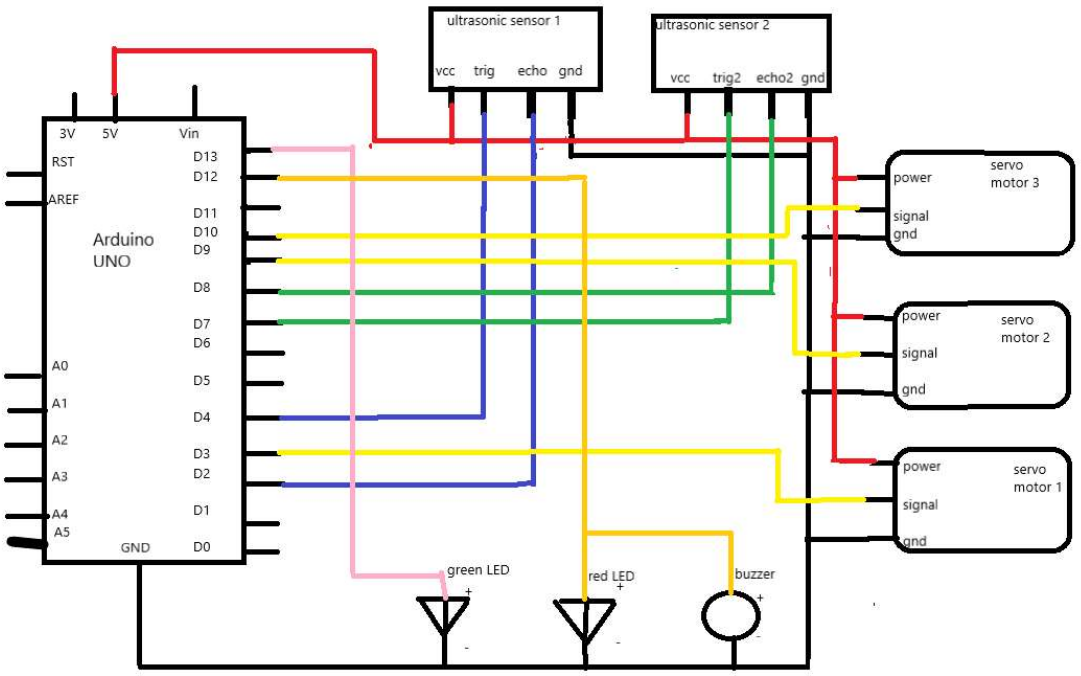
Due to the pandemic, life is really been on threat now for everyone especially for office going people. The same threat prevails for employees when customers visit their shops. As a thought of bringing relief upto an extent by proper sanitization in these cases, here is an IoT solution.

In addition to the normal glass door of the office, there should be one another pass gate (pass gate like what we see at libraries or metro railway stations which opens when access is granted). When people come to the office, the glass door opens automatically as a sign of welcoming them. But when they pass the glass door and come inside, there is this pass gate. The pass gate will be opened only if they are sanitized. There are automatic sanitizer dispensers for this purpose. When the person stretches hands towards the dispenser, it dispenses the liquid and giving a few seconds for them to rub the liquid well on their hands, the pass gates will be opened for 3 seconds by simultaneously denoting the green light blink thrice and then with a long beep sound the red light turns on denoting the closure of gate. Here this a design of this using tinkercad.

Project design:



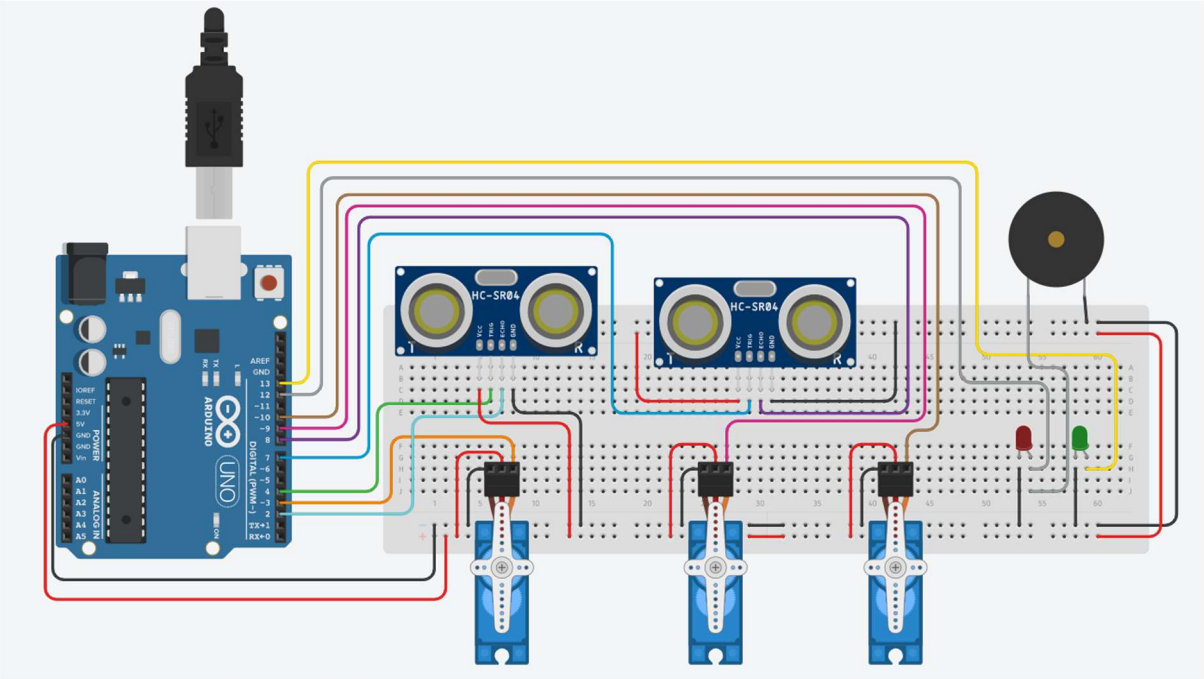
Circuit diagram:



Components:

Sl.no	Name	Quantity
1	Arduino UNO	1
2	Ultrasonic sensor	2
3	Servo motor	3
4	Green LED	1
5	Red LED	1
6	Buzzer	1
7	Breadboard	1

Simulation wiring in tinkercad:



Working:

At the entrance there is an ultrasonic sensor which will measure the distance from an object. When someone comes near to the main entrance door i.e here that distance is kept as 12 inches, the servo motor takes a 90 degrees rotation which intern opens the door. After 3 seconds the door will close if there is no more motion within 12 inch distance.

Then we come across the sanitizer dispenser which contains an ultrasonic sensor and a servo motor. When the person stretches his hands towards the dispenser, when hands reaches a distance of 2 inches from the dispenser the servo motor makes a 90 degree rotation which intern dispenses the sanitizer and after 2 sec the servo motor comes back to 0 degree which stops the dispense of sanitizer.

Then the person gets 5 sec to rub the sanitizer well on his hands, after this another servo motor at the pass gate takes a 360 degree rotation which intern opens the pass gate, at the same time the green led blinks thrice. After 3 sec the pass gate closes and while closing the red led glows and buzzer turns on for 2 seconds.

Program:

```
//call Servo library
#include <Servo.h>
//initialising the pins
//trig1,echo1 belongs to ultrasonic sensor 1 which is at the entrance
#define trig1 4
#define echo1 2
//trig2,echo2 belongs to ultrasonic sensor 2 which is at the sanitizer dispenser
#define trig2 7
#define echo2 8
//duration1,duration1 corresponding to ultrasonic sensor 1
long duration1=0;
float distance1=0;
//duration2,duration2 corresponding to ultrasonic sensor 2
long duration2=0;
float distance2=0;
//pin 3 corresponding to servo motor 1 at the entrance
Servo servo_3;
//pin 9 corresponds to servo motor 2 at the sanitizer dispenser
Servo servo_9;
//pin 10 corresponding to servo motor 3 at the pass gate
Servo servo_10;

void setup()
{
 servo_3.attach(3);
 servo_9.attach(9);
 servo_10.attach(10);
 pinMode(trig1,OUTPUT);
 pinMode(echo1,INPUT);
```

```
 Serial.begin(9600);
 pinMode(trig2,OUTPUT);
 pinMode(echo2,INPUT);
 Serial.begin(9600);
 //red led at pin 12
 pinMode(12,OUTPUT);
 //green led at pin 13
 pinMode(13,OUTPUT);

}

void loop()
{
 servo_3.write(0);
 servo_9.write(0);
 servo_10.write(0);
 //trigger the US pulse,listen to echo
 //stop the junk waves
 digitalWrite(trig1,LOW);
 delay(0.002);
 //start sound
 digitalWrite(trig1,HIGH);
 delay(0.01);
 digitalWrite(trig1,LOW);
 duration1=pulseIn(echo1,HIGH);
 //calculating the distance
 distance1=(duration1/58.138)*0.39;
 //serial monitor prints distance only if distance1 is less than or equal to 12 inch
 if(distance1<=12)
 {
  Serial.println(distance1);
```

```
}
//trigger the US pulse,listen to echo
//stop the junk waves
digitalWrite(trig2,LOW);
delay(0.002);
//start sound
digitalWrite(trig2,HIGH);
delay(0.01);
digitalWrite(trig2,LOW);
duration2=pulseIn(echo2,HIGH);
distance2=(duration2/58.138)*0.39;
//serial monitor prints distance only if distance2 is less than or equal to 2 inch
if(distance2 <= 2)
{
 Serial.println(distance2);
}
//if the distance measured by US sensor 1 is less than or equal to 12 inch
if(distance1 <= 12)
{
 //servo motor 1 takes a 90 degree rotation indicating the opening of main door
 servo_3.write(90);
 //it remains open for 3 sec
 delay(3000);
}
else
{
  //if distance measured by the US sensor 1 is greater than 12inch the servo motor 1 won't rotate indicating the main door is closed
  servo_3.write(0);
}
//if the US sensor 2 at the sanitizer dispenser is less than or equal to 2 inch
```

```
 if(distance2 <= 2)
{
 //servo motor 2 takes a 90 degree rotation indicating the sanitizer is dispensed
 servo_9.write(90);
  //time delay of 2 sec to dispense the sanitizer
 delay(2000);
  //servo motor comes back to 0 degree indicating the santizer dispense stops
 servo_9.write(0);
  //time delay of 5 sec to rub the sanitizer on hands
 delay(5000);
  //after 5 sec the servo motor 3 takes 360 degree turn indicating the pass gate opening
 servo_10.write(360);
  //at the same time green led glows
 digitalWrite(13,HIGH);
  //time delay of 1 sec ,for 1 sec green led turns on
 delay(1000);
  //green led turns off for o.5 sec
 digitalWrite(13,LOW);
 delay(500);
  //for 1 sec green led turns on
 digitalWrite(13,HIGH);
 delay(1000);
  //green led turns off for o.5 sec
 digitalWrite(13,LOW);
 delay(500);
   //for 1 sec green led turns on
 digitalWrite(13,HIGH);
 delay(1000);
  //green led turns off for o.5 sec
 digitalWrite(13,LOW);
 delay(500);
```

```
    //servo motor 3 comes back to 0 degree indicating the closure of pass gate
   servo_10.write(0);
    //by the closure of pass gate red led turns on for 2 sec along with this buzzer turns on
   digitalWrite(12,HIGH);
   delay(2000);
   // red led turns off
   digitalWrite(12,LOW);
  }

}
```