SIMULATION OF SOCIAL DISTANCING CAP

USING TINKERCAD

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PROJECT REPORT

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BONAFIDE CERTIFICATE

Certified that this project report " **Simulation of Social Distancing Cap using TinkerCAD** " is the bonafide work of **Kapil Raj (P191312),Linet M Shaji (P191314),Dhava Kumar (P191308),S. Chiranjeevi (P191307) and Y. Dayanand Kumar (P191321)** who carried out the project under my supervision for the course title MSCE07: Internet of Things.

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DECLARATION

We hereby declare that this project titled " **Simulation of Social Distancing Cap using TinkerCAD** " submitted for the course MSCE07: Internet of Things, Department of Computer Science, School of Mathematics and Computer Science, Central University of Tamil Nadu, Thiruvarur – 610 005, is a record of bonafide project work carried out by us under the guidance and supervision of Dr.R.Saranya, Department of Computer Science, Central University of Tamil Nadu, Thiruvarur – 610 005. This work is original and has not been submitted, in part or full to this or any other University / Institution.

Place: Thiruvarur

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ABSTRACT

This project presents a simulation using electronic components and IoT to maintain social distancing. In this pandemic it is very important to maintain social distance of at least 122 cm(4 feet) to prevent corona virus. The proposed system help us to maintain social distancing using the ultrasonic sensor and the Arduino Uno. In this simulation of social distancing cap, ultrasonic sensor is used to measure the distance between two people and if the distance is less than 122 cm it will give alert by producing low frequency buzzer sound and by glowing orange LED. Apart from this, when the object is very near to the sensor (distance less than 80 cm) it will give alert by producing high frequency buzzer sound and by glowing red LED. So the proposed simulation will give us two types of alert which help us to maintain social distancing.

1.INTRODUCTION

We all are facing the COVID-19 pandemic situation and due to this we also struggling with many problems. This deadly virus made us to reside in our home itself. We stayed in homes not for a day or weeks, it has been months staying in homes like house arresting ourselves. This corona virus took many lives in our world and we should be more precautions about being not affected by this virus. So mainly it will transfer through physical contact and through the daily use things also. To be free of this virus we should follow the important precautions in our daily life like having good hygiene, washing hands frequently, sanitizing the things we use, etc. One of the main precautions is maintaining social distance between the people.

This project is about the possibility of simulating a Social Distancing Cap using IoT and Simulation Software to maintain social distancing between people. This project uses the Arduino UNO and the electronic components such as Ultrasonic Sensor, Buzzer and the LEDs for simulation.

2. PROBLEM DEFINITION & REQUIREMENTS

The objective of this project is to design a simulation of the social distancing cap to maintain social distancing.
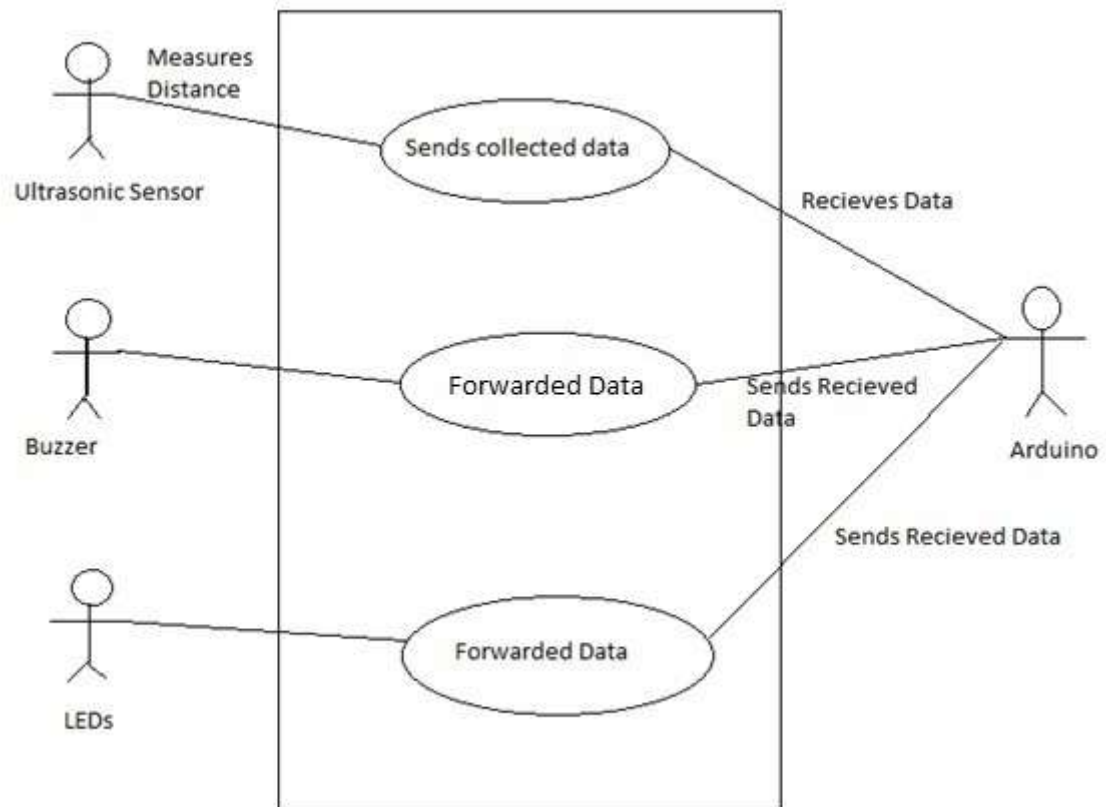
2.1. PROPOSED SYSTEM

The proposed system will help us to maintain social distancing using the ultrasonic sensor and the Arduino UNO. In this simulation of the social distancing cap, the ultrasonic sensor is used to measure the distance between the two peoples and if the distance is less than 122 cm it will give an alert by producing low frequency buzzing sound and by glowing orange LED. Apart from this, when the object is very near to the sensor (distance less than 80 cm) it will give an alert by producing high frequency buzzing sound and by glowing red LED. So the proposed the simulation will give us two types of alert which help us to maintain social distancing.

2.2. REQUIREMENT SPECIFICATION

i. Arduino Uno
ii. Ultrasonic Sensor
iii. Buzzer
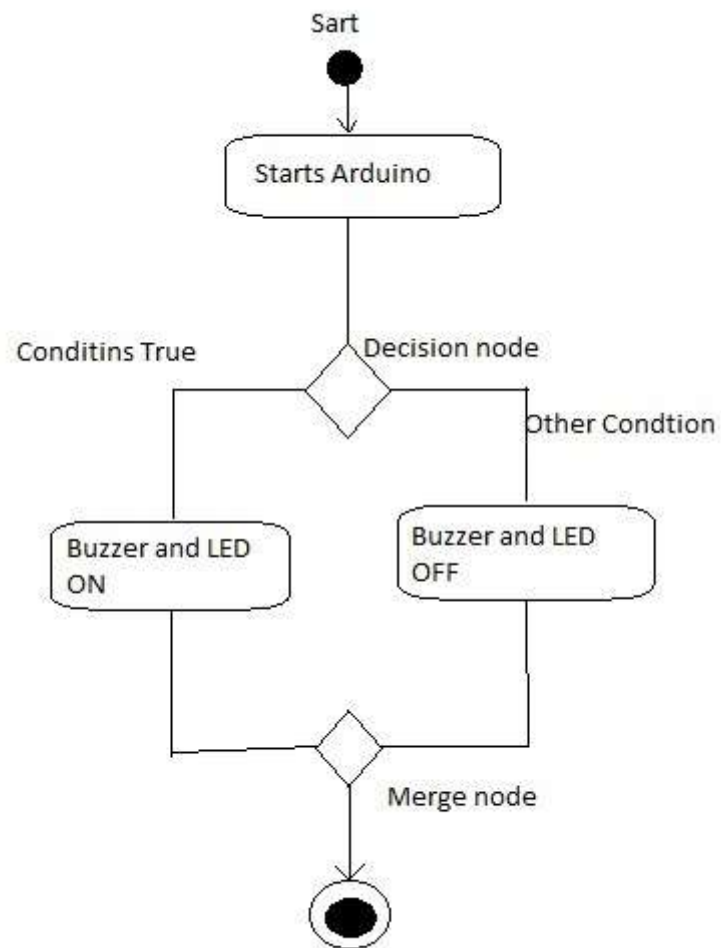iv. Led (Red and Orange)
v. Breadboard
vi. Jump wires

3. SYSTEM ANALYSIS

3.1 USE CASE DIAGRAM

3.2 ACTIVITY DIAGRAM
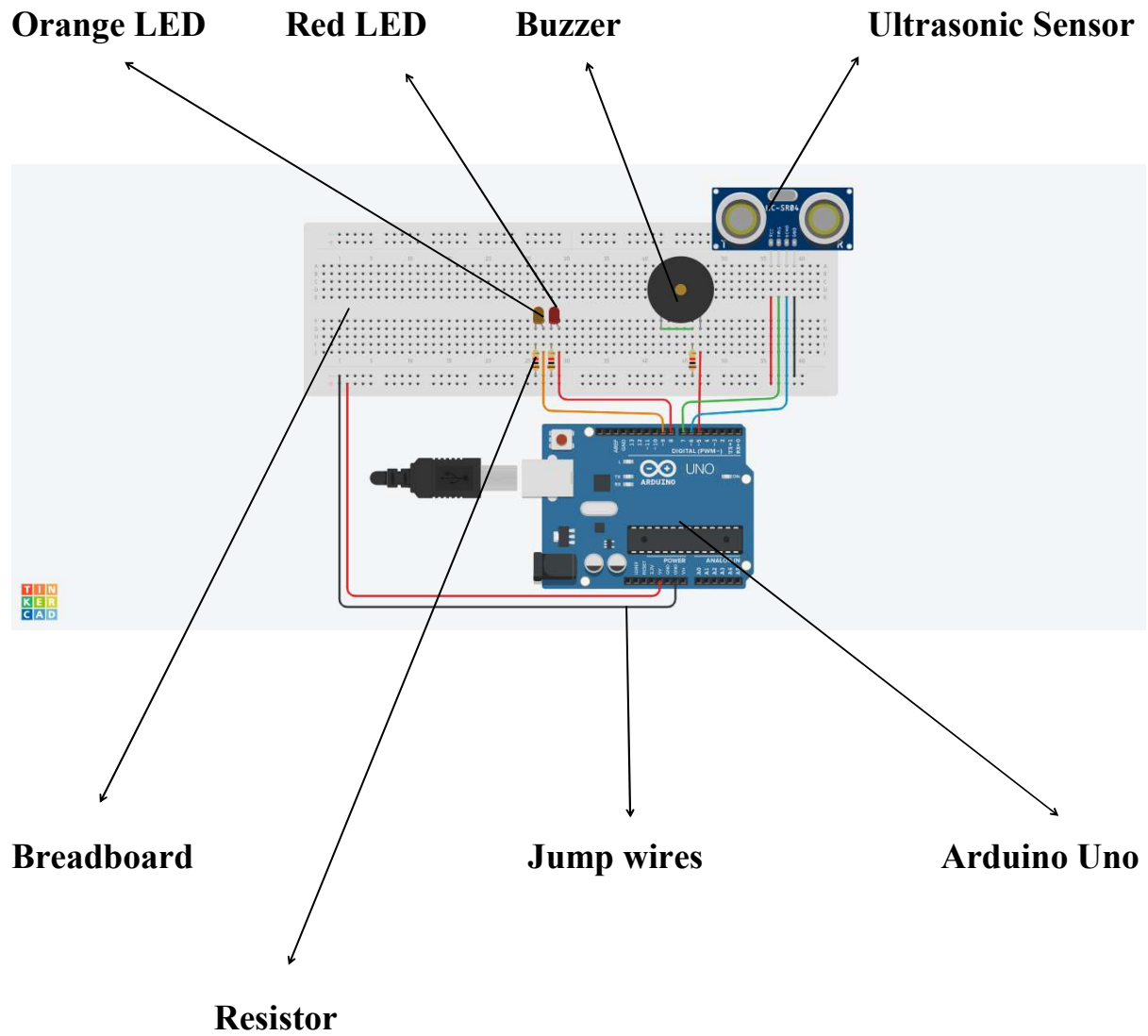
Sart

Starts Arduino

Conditins True

Decision node

Other Condtion

Buzzer and LED ON

Buzzer and LED OFF

Merge node

4. SYSTEM DESIGN

4.1 ARCHITECTURAL DESIGN

Orange LED   Red LED   Buzzer   Ultrasonic Sensor

Breadboard   Jump wires   Arduino Uno

Resistor

5. IMPLEMENTATION & SCREENSHOTS

Source Code:

//Defines the pins that connected to the I/O pins of the Arduino Uno Board

```
#define trigPin 7

#define echoPin 6

#define orange 9

#define red 8

#define buzzer 5

int sound = 150;

int sound1 = 300;
```

// Code for configuring pins as input or output

```
void setup(){

  Serial.begin (9600);

  pinMode(trigPin, OUTPUT);

  pinMode(echoPin, INPUT);

  pinMode(orange, OUTPUT);

  pinMode(red, OUTPUT);

  pinMode(buzzer, OUTPUT);

}
```

// **code for continuously measuring the distance between object and the sensor and to provide alert by glowing LED and by producing buzzer code**

```
void loop() {

  long duration, distance;

  digitalWrite(trigPin, LOW);

  delayMicroseconds(2);

  digitalWrite(trigPin, HIGH);

  delayMicroseconds(10);

  digitalWrite(trigPin, LOW);

  duration = pulseIn(echoPin, HIGH);

  distance = (duration/2) / 29.1;

  if (distance <=122) {

    digitalWrite(orange, HIGH);

    sound1 = 150;

  }

  else {

    digitalWrite(orange,LOW);

  }

  if (distance <=80) {

    digitalWrite(red, HIGH);

    sound = 300;
```

```
  }else {
     digitalWrite(red,LOW);
  }
  if (distance <= 80){
     Serial.print(distance);
     Serial.println(" cm");
     tone(buzzer, sound);
  }else if(distance>80 && distance<=122){
     Serial.print(distance);
     Serial.println(" cm");
     tone(buzzer, sound1);
  }else {
   Serial.println("Out of range");
   noTone(buzzer);
}
delay(500);
  }
```

Output:

Serial Monitoring:

```
Serial Monitor
12 cm
Out of range
35 cm
43 cm
58 cm
73 cm
35 cm
35 cm
```
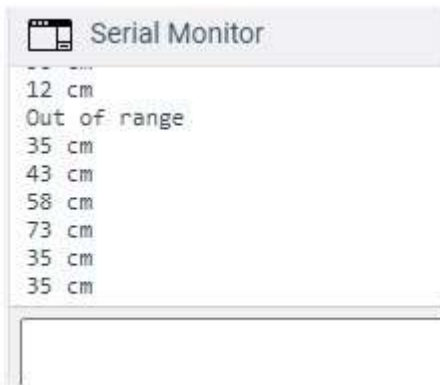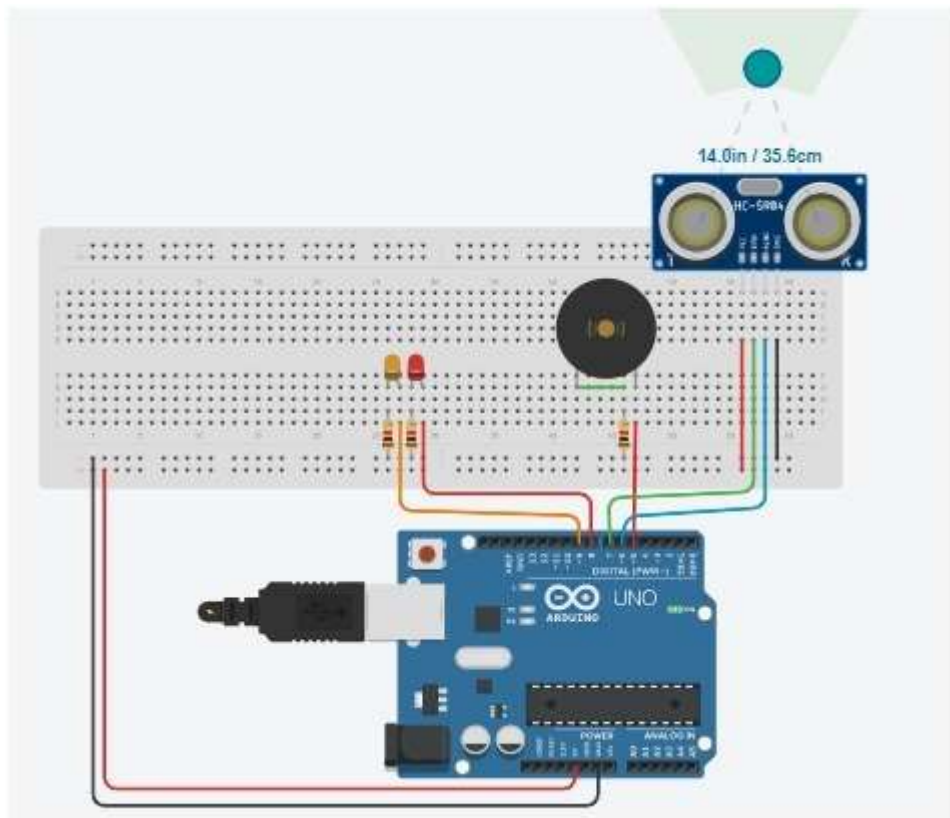
When the orange LED is blinking:
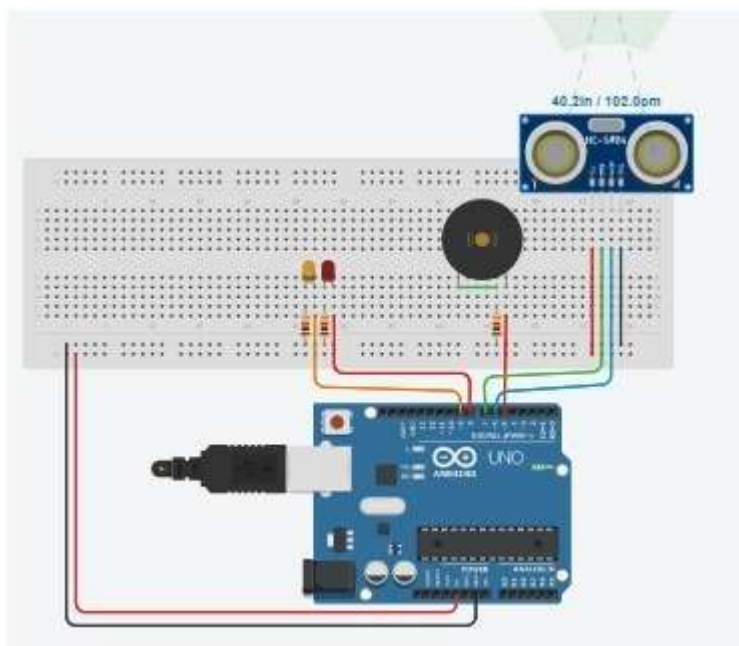
It will warn us by the glow of orange LED when the distance is between 80 and 122 cm.

When red LED is blinking:

It will warn us by the glowing red LED when the distance is less than 80 cm.

CONCLUSION

This system will help us to maintain the social distance when we have to go out into the middle of the people in some urgency and necessary conditions. We can helpful to the government by following the precautions suggested by our government. It is our responsibility as a citizen to maintain social distancing among ourselves. Through this system we can detect the distance and it will warn us and also opposite person. Therefore, we can reduce the spread of this COVID-19 and we can start our normal and happy life once we get rid of this dangerous virus.

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