

IOT BASED SMART SOCIAL DISTANCING REMAINDER

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ABSTRACT :

The Internet of Things is a revolutionary domain that has the caliber to impact our lives and bring significant changes to the world. Several IoT applications have been envisioned to facilitate data driven and smart application for the user. Smart City and Intelligent Transportation System (ITS) offer a futuristic vision of smart, secure and safe experience to the end user, and at the same time efficiently manage the sparse resources and optimize the efficiency of city operations. However, outbreaks and pandemics like COVID-19 have revealed limitations of the existing deployments, therefore, architecture, applications and technology systems need to be developed for swift and timely enforcement of guidelines, rules and government orders to contain such future outbreaks. This work outlines novel architecture, potential use-cases and some future directions in developing such applications using Smart city.

With the significant increase in the cases of Covid-19, social distancing has become very important to secure us from virus. Social distancing is one of the most important defenses against the spread of COVID-19. This epidemic situation may keep on getting worst without social distancing and if we going on doing such activities without social distancing it may lead to virus affection. Physical distancing helps limit the spread of COVID-19 and it means we keep a distance of at least 1m from each other and avoid spending time in crowded places or in groups. But physical distancing may leads to spread of virus without knowing to our knowledge. To avoid this, IOT gives you a solution to overcome about it. To tackle this situation, the Social Distancing Reminder System using IOT can give a beneficial solution to keep the distance between each other and to maintain a proper health care. It detects and gives an alarm message and LCD flashes when the person approaches closer. It also measures the temperature of the people and gives an alarm message for that too. It is highly useful for us to detect easily.

INTRODUCTION :

The Internet of Things (IoT) is a well-defined scheme of interconnected computing tactics, digital, and mechanical devices possessing the capability of transmission of data over the defined network without having any human involvement at any level. There are a variety of IoT devices available that can help business leaders successfully implement physical distancing in their offices. Thermographic camera technology coupled with facial recognition can create a baseline for each employee and then assist in determining if an employee has a temperature outside of their norm. Other remote health monitoring may also take place with healthcare providers, helping employees determine on a daily basis if they are well enough to go into work. Social and physical distancing measures aim to slow the spread of disease by stopping chains of transmission of COVID-19 and preventing new ones from appearing. In the present pandemic situation, all the countries, including India, are fighting with COVID-19 and still looking for a practical and cost-effective solution to face the problems arising in several ways. Researchers in physical sciences and engineering are attempting to take such challenges, to grow new theories, to describe new study problems, to generate user-centred explanations, and to edify ourselves and the overall civilian. This brief review has aimed to provide awareness of this innovative technology and its significant applications for COVID-19 pandemic. During the time of required social distancing, this project measures how close you are to others for safety purpose. It detects how you are closer and the distance between one person to another and it also measures the temperature of the people and if you are getting close and the temperature is high, it gives a alarm message and the LCD flashes. so that you can identify and detect that you are close it is not safe. It could identify easily and protect us from virus transmission. It is highly beneficial for us during lockdown period. All high-risk patients are trackeily using the internet-based network. This technology is used for biometric measured easements like blood pressure, heartbeat and glucose level too not only for temperature.

EXISTING SYSTEM :

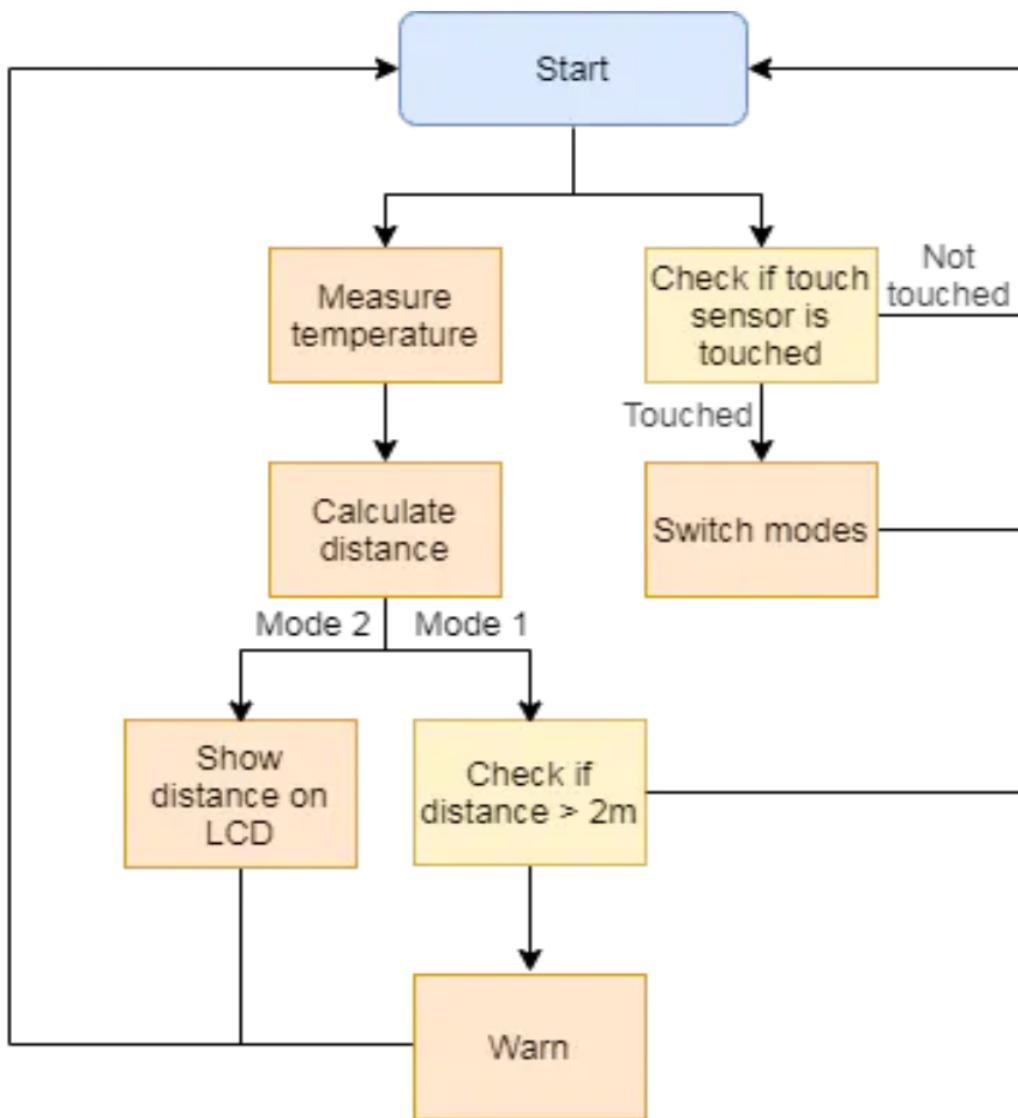
DISADVANTAGES :

Social distancing, also called “physical distancing,” means keeping a safe space between yourself and other people who are not from your household. To practice social or physical distancing, stay at least 6 feet (about 2 arms’ length) from other people who are not from your household in both indoor and outdoor spaces.

Social distancing should be practiced in combination with other everyday preventive actions to reduce the spread of COVID-19, including wearing cloth face coverings, avoiding touching your face with unwashed hands, and frequently washing your hands with soap and water for at least 20 seconds. COVID-19 spreads mainly among people who are in close contact (within about 6 feet) for a prolonged period. Spread happens when an infected person coughs, sneezes, or talks, and droplets from their mouth or nose are launched into the air and land in the mouths or noses of people nearby. The droplets can also be inhaled into the lungs. Recent studies indicate that people who are infected but do not have symptoms likely also play a role in the spread of COVID-19. Since people can spread the virus before they know they are sick, it is important to stay at least 6 feet away from others when possible, even if you—or they—do not have any symptoms. Social distancing is especially important for people who are at higher risk for severe illness from COVID-19. There are many social distancing tips and if we follow that correctly no problem but in case of not following may lead to virus affection. Without knowing we may go closer to somebody and talk, play or do something with them. It may lead to non-social distancing. For avoiding this we are using IOT based technique. It is a very good disadvantage of Physical social distancing.

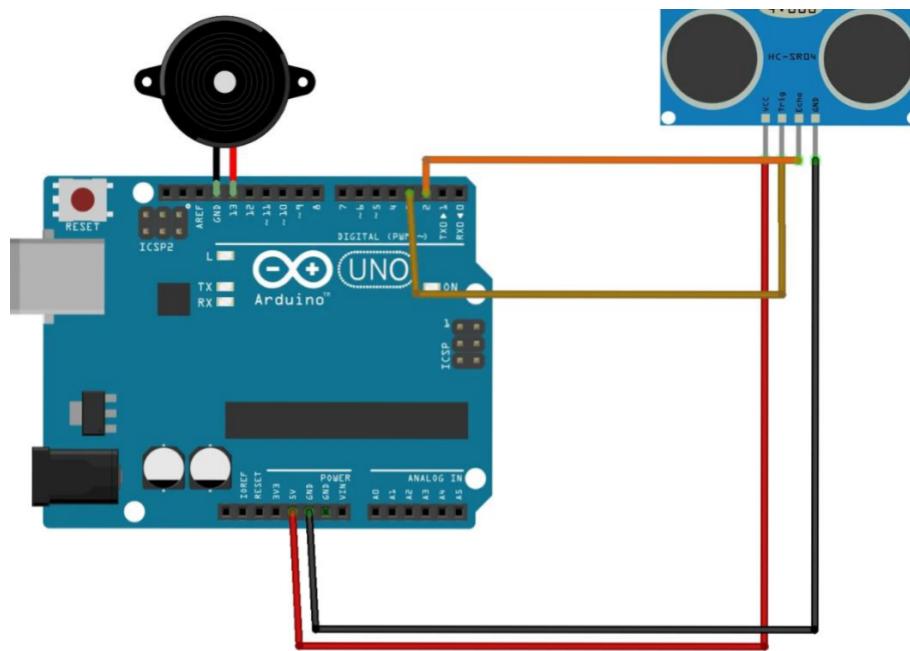
PROPOSED SYSTEM :

BLOCK DIAGRAM :



The simplified algorithm

CIRCUIT DIAGRAM :



WORKING PRINCIPLE :

The Arduino is used to measure the temperature. The temperature is used to calculate the distance with greater accuracy.

If the Arduino is on Mode 1 :

- If the distance is between 2m and 1m, the LCD backlight lights up and the LCD shows "Please keep away" and shows how far away the person is.
- If the distance is 1m - 50cm the backlight of the LCD flashes and the LCD shows "Keep away"
- If the distance is less than 50cm the backlight turns off and on twice a second and the LCD shows "STAY AWAY!"

If the Arduino is on Mode 2 :

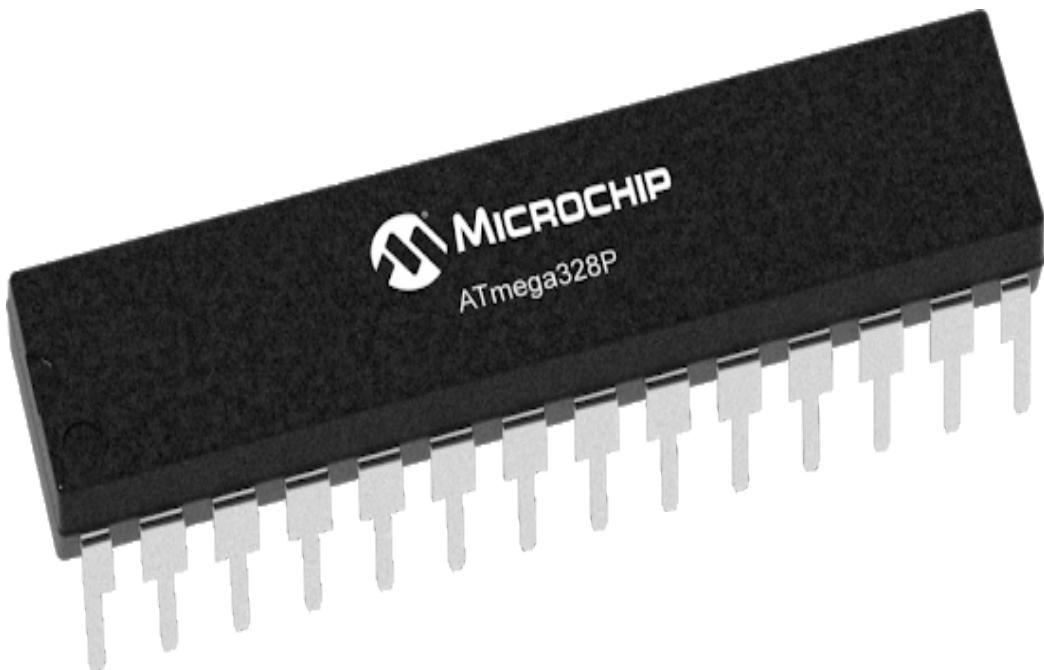
- The LCD shows the distance on the top and the temperature on the bottom of the screen.

Purpose of project :

To alert others to maintain a 2-meter distance from you. It is a 2-in-1 as the thermistor is not only used to add accuracy to the distance measurement (the speed of sound changes depending on the temperature) but it also means that – by using a button or a touch sensor to switch between the modes – it can have two modes: alerting if someone comes close to you (Mode 1) and measuring the temperature and the distance (Mode 2). The measuring mode shows the temperature and the distance on the LCD.

CONTROLLER USED :

1. ARDUINO UNO - (ATmega328p)



FEATURES OF ARDUINO UNO (ATmega328p) :

Arduino Uno is a microcontroller board based on the ATmega328.
ATMEGA328P – Simplified Features

CPU	8-bit AVR
Number of Pins	28
Operating Voltage (V)	+1.8 V TO +5.5V
Number of programmable I/O lines	23
Communication Interface	Programmable Serial USART(2,3 PINS)
Analog Comparators	1(12,13 PINS)
External Oscillator	0-20MHz @ 4.5V to 5.5V
Internal Oscillator	8MHz Calibrated Internal Oscillator
Program Memory or Flash memory	32Kbytes[10000 write/erase cycles]
ADC Module	6channels, 10-bit resolution ADC

REASON FOR USING ARDUINO UNO (ATmega328p) :

- ATMEGA328P is a high performance, low power controller from Microchip.
- ATMEGA328P is an 8-bit microcontroller based on AVR RISC architecture.

SENSORS USED :

1. ULTRASONIC SENSOR



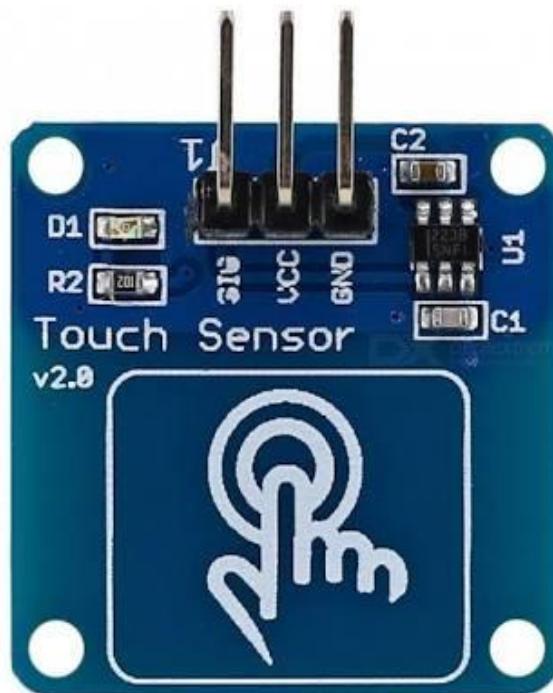
REASON :

In this project, I have used Ultrasonic Sensor which helps us to maintain the distance. If any person comes within the range then the alarm continues to ring and the LCD flashes.

FUNCTIONS :

- An ultrasonic sensor is an instrument that measures the distance to an object using ultrasonic sound waves.
- An ultrasonic sensor uses a transducer to send and receive ultrasonic pulses that relay back information about an object's proximity.

TOUCH SENSOR :

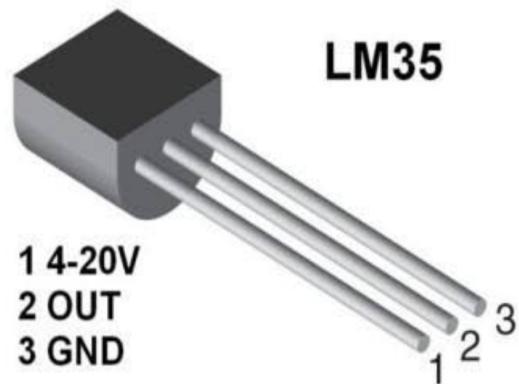


REASON : It is used to touch between the modes also to change the modes.

FUNCTIONS :

- A touch sensor is an electronic sensor used in detecting and recording physical touch. It is also known as tactile sensors.
- A touch sensor detects touch or near proximity without relying on physical contact. Present day touch sensors can replace mechanical buttons and switches.

TEMPERATURE SENSOR :



REASON : It is used to detect the temperature of the person and gives a message.

FUNCTIONS :

- Temperature Sensors measure the amount of heat energy or even coldness that is generated by an object or system, allowing us to “sense” or detect any physical change to that temperature producing either an analogue or digital output.

LIST OF TOOLS AND SOFTWARE USED :

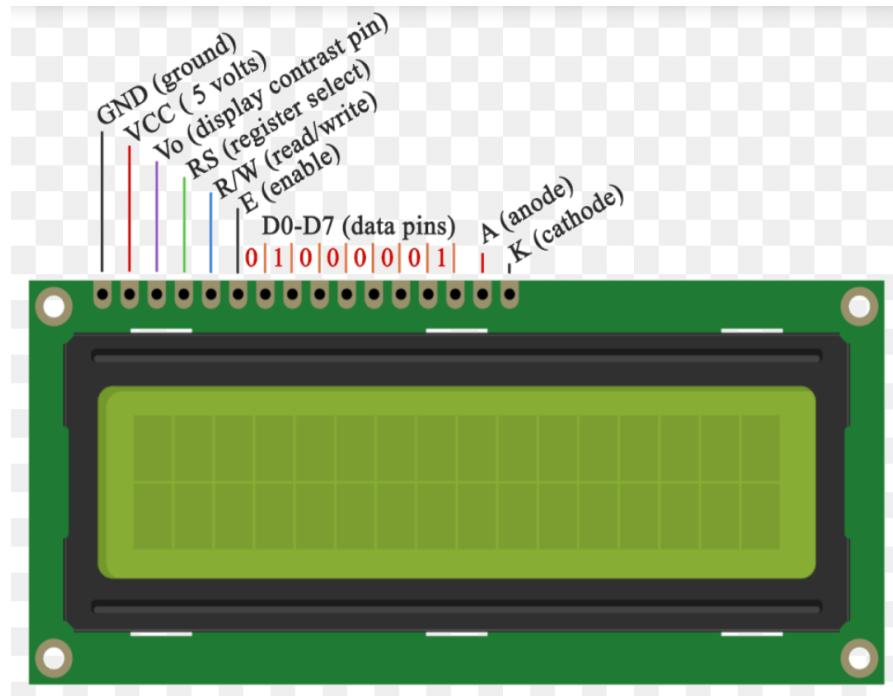
1.NTC THERMISTOR



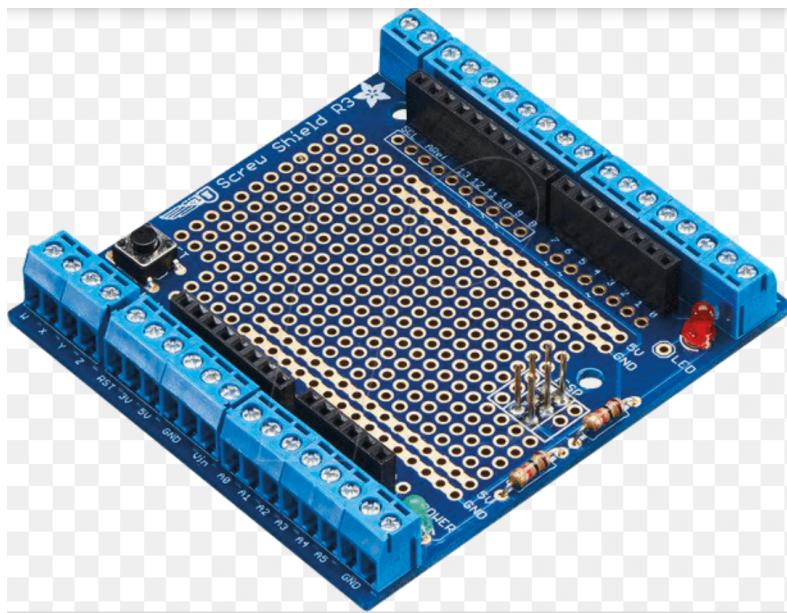
2.ROTATORY POTENTIOMETER



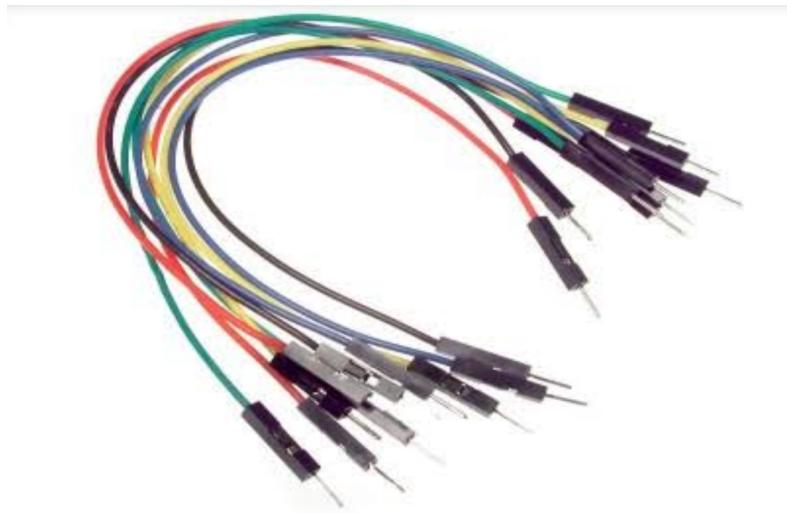
3.ELEGOO 16x12 LCD DISPLAY :



4.ARDUINO PHOTO SHIELD :



5.JUMP WIRES :



6.RESISTOR :



7.ADAFRUIT MINI BREADBOARD :



SOFTWARE USED :

- ARDUINO IDE - For compilation

CODE :

```
#include <HCSR04.h>
#include <LiquidCrystal.h>
#define trigPin 7
#define echoPin 6
#define buzzer 9
#define backlight 10
LiquidCrystal lcd(12, 11, 5, 4, 3, 8);
UltraSonicDistanceSensor distanceSensor(trigPin, echoPin);
int tempReading;
double tempK;
```

```
float tempC;
int rounded;
int temp_round;
volatile boolean modes = 0;
double distance;

void setup() {
    lcd.begin(16, 2);
    attachInterrupt(0, changeMode, FALLING);
    pinMode(2, INPUT);
    pinMode(buzzer, OUTPUT);
    pinMode(backlight, OUTPUT);
    digitalWrite(backlight, HIGH);
    backlightOn();
}

void loop() {
    tempReading = analogRead(A0);
    tempK = log(10000.0 * ((1024.0 / tempReading - 1)));
    tempK = 1 / (0.001129148 + (0.000234125 + (0.0000000876741 *
tempK * tempK )) * tempK );
    tempC = tempK - 273.15;
    distance = distanceSensor.measureDistanceCm(tempC);
    temp_round = round(tempC);
    if (modes == 1) {
        backlightOn();
        if (distance >= 300 || distance <= 0) {
            rounded = 0;
            lcd.clear();
            lcd.print("Out of range");
        }
    }
}
```

```
lcd.setCursor(0, 1);
lcd.print("Temperature:" + String(temp_round) + " C");
}
else {
    rounded = round(distance);
    lcd.clear();
    lcd.print("Distance: ");
    lcd.print(rounded);
    lcd.print(" cm");
    lcd.setCursor(0, 1);
    lcd.print("Temperature:" + String(temp_round) + " C");
}
} else {
    if (distance >= 300 || distance <= 0) {
        rounded = 0;
        lcd.clear();
        backlightOff();
    }
    else {
        rounded = round(distance);
        if (distance >= 200) {
            backlightOff();
            lcd.clear();
        }
        else if (distance <= 200 && distance > 100) {
            backlightOn();
            lcd.clear();
            lcd.print("Please keep away");
            lcd.setCursor(0, 1);
            lcd.print("Distance:");
        }
    }
}
```

```
lcd.print(rounded);
lcd.print(" cm");
}

else if (distance <= 100 && distance > 50) {
    backlightOn();
    lcd.clear();
    lcd.print("Keep away");
    lcd.setCursor(0, 1);
    lcd.print("Distance:");
    lcd.print(rounded);
    lcd.print(" cm");
    delay(200);
    buzz();
    backlightOff();
    delay(100);
    unbuzz();
    backlightOn();
    delay(100);
}

else if (distance <= 50) {
    backlightOn();
    lcd.clear();
    lcd.print("STAY AWAY!");
    lcd.setCursor(0, 1);
    lcd.print("Distance:");
    lcd.print(rounded);
    lcd.print(" cm");
    delay(200);
    buzz();
    backlightOff();
```

```
    delay(200);
    unbuzz();
    backlightOn();
    delay(200);
    buzz();
    backlightOff();
    delay(200);
    unbuzz();
    backlightOn();

}
```

```
}
```

```
}
```

```
}
```

```
delay(700);
```

```
}
```

```
void changeMode() {
    modes = !modes;
}
```

```
void backlightOn() {
    digitalWrite(backlight, HIGH);
}
```

```
void backlightOff() {
    digitalWrite(backlight, LOW);
}
```

```
void buzz() {
    digitalWrite(buzzer, HIGH);
}
```

```
void unbuzz() {  
    digitalWrite(buzzer, LOW);  
}
```

OUTPUT :



APPLICATIONS :

- It is used in all the offices,homes, playgrounds,outside areas and everywhere for safety purposes.
- It is used for the officers to detect more easily to avoid virus transmission.
- It is used to measure the temperature of the person carefully and update it in all the places like banks,airports etc.
- It works very finely in all places to avoid transmission of virus you may fix anywhere.It is weightless and incapable of medium.
- It is highly beneficial to us in all ways like measuring temperature and maintaining distances.

CONCLUSION :

Hence it will produce an alarm message and LCD flash when the distance between person to person is closer and when the temperature is high. By this message we conclude that we should stay away from that.