VISVESVARAYA TECHNOLOGICAL UNIVERSITY

"JnanaSangama", Belagavi-18, Karnataka, India

MINI PROJECT REPORT

On

"COVID-19 SOCIAL DISTANCING REMINDER''

Submitted in partial fulfilment of the requirement for the degree of

BACHELOR OF ENGINEERING

in

MEDICAL ELECTRONICS

During academic year 2021 – 2022

By

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DAYANANDA SAGAR COLLEGE OF ENGINEERING

ShavigeMalleshwara Hills, Kumaraswamy Layout, Bangalore-560078

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DEPARTMENT OF MEDICAL ELECTRONICS ENGINEERING

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CERTIFICATE

This is to certify that the Mini-Project titled 'COVID – 19 social distancing reminder'is a bonafide work carried out by Nisarga V, Prakruthi. H. U, Laxmi bearing USN (1DS20MD025, 1DS20MD029, 1DS20MD018) respectively of 3rd semester, Department of Medical Electronics, DSCE an autonomous institute affiliated to **Visvesvaraya Technological University** and partial fulfilment for the Degree of **Bachelor of Engineering** during the year 2020-21. This certified that all the suggestion indicated has been incorporated**.** The mini-project report has been approved as it satisfies the academic requirements prescribed for the above said degree.

Signature of guide	Signature of project coordinator	Signature of HOD
Dr. Murigendrayya. M. H	**Prof. Suma. R. Nadig**	**Dr.V G Sangam**
Assistant professor	Assistant professor	Professor& Head
Dept. of ML	Dept. of ML	Dept. of ML
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DECLARATION

We, Nisarga V, Prakruthi. H. U, Laxmi, hereby declare that this mini-project entitled **"COVID 19 social distancing reminder"** embodies report of our mini-project work carried out under the guidance of **Prof. Murigendrayya. M. H,** Assistant Professor, Department of Medical Electronics, Dayananda Sagar College of Engineering, Bengaluru.

This mini-project report is submitted to **Visvesvaraya Technological University, Belagavi, Karnataka,** in partial fulfilment of requirements for the award of degree **Bachelor of Engineering** in **Medical Electronics** during the academic year **2020-21**. Further, the matter embodied in the miniproject report has not been submitted previously by anybody for the award of degree or diploma to any other University.

Place – Bengaluru Date:

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PRAKRUTHI. H. U(1DS20MD029)

LAXMI(1DS20MD018)

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Nisarga V
Prakruthi. H. U,
Laxmi

ABSTRACT

In present situation, social distancing is most important fact. Reasonably, the most reliable approach to slowing down the spread of the coronavirus is to keep away from others; prevention is better than cure. However, it would be irritating to turn around every thirty seconds and look if someone was approaching you. It would be helpful if there were a device that could warn others to keep away from you.

That is the purpose behind the 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.

CONTENTS

LIST OF TABLES AND FIGURES

CHAPTER 1

INTRODUCTION

Since COVID-19 has become a pandemic, the entire world fiinding ideas and methods to stop the spread of it. As the ground rule to stop the spread is to maintain social distance and wearing a mask while going out. The novel COVID or COVID-19 began spreading during 2019 December at first from China, the city guest Wuhan. In china, the infection is started from the creatures and spread generally as a pandemic circumstance everywhere on the world. Coronavirus infection communicates to others however coordinate actual contact with the influenced patients and through air. The infection straightforwardly hit the lung cells through respiratory arrangement of the patients and permits it to recreate the infection and makes an extreme irresistible problem in an exceptionally limited ability to focus time. Symptoms of COVID -19 the most widely recognized manifestations of COVID are dry hack, fever, windedness, discomfort and migraine. The quick send of COVID produce serious muscle torments and Empower the individuals with debilitate invulnerable framework got tainted by it without any problem. The outrageous phase of COVID-19 prompts demise of numerous people groups with extreme failing of lung and different organs of the body. Different examples of medicines are dealing with by the doctors everywhere on the world to find an effective meethod of restricting the infection being communicated to most exceedingly terrible stage.Research towards COVID-19 there are three significant networks helped with advanced innovations can be found in more certain commitment on battling against COVID-19.

The virus mainly spreads in those people; who are in close contact with each other (within 6 feet) for a long period. The virus spreads when an infected person sneezes, coughs, or talks, the droplets from their nose or mouth disperse through the air and affect nearby peoples. The droplets also transfer into the lungs through the respiratory system, where it starts killing lung cells. Recent studies show that individuals with no symptoms but are infected with the virus also play a part in the virus spread (W. C. D. C. Dashboard). Therefore, it is necessary to maintain at least 6 feet distance from others, even if people do not have any symptoms.

Social distancing is the one of the effective method for fight against Covid-19. We saw lot of the projects for social distancing. Social distancing badge, Social distancing helmet, etc… But the mechanism of all the devices are same. Today we discuss about the working of these type of devices. For making this, we need a microcontroller (here we use Arduino uno), ultrasound sensor, touch sensor, buzzer and potentiometer.

CHAPTER 2

LITERATURE SURVEY

[1] Dubov A, Shoptawb S. The value and ethics of using technology to contain the COVID-19 epidemic. The American Journal of Bioethics. 2020 Jul 2;20(7):W7-11.

[2] Ghai M, Gupta R. Ultrasonic sensor based social distancing device. International Journal of Sensor Networks. 2021;36(3):139-45.

[3] Shah J, Gala H, Pattni K, Kanani P. Arduino Based Temperature, Mask Wearing and Social Distance Detection for COVID-19. InInternational Conference on Internet of Things and Connected Technologies 2021 Jul 29 (pp. 148-161). Springer, Cham.

[4] Anguraj K, VM R, JamunaRani M, Ashok S. Distance Monitoring Alarm For Covid 19 Using Ultrasonic Sensor. Annals of the Romanian Society for Cell Biology. 2021 Apr 27:11571-8.

CHAPTER 3

OBJECTIVES

1.Development system that alerts the people to maintain a 2-meter distance.

2.Impementing two functions that operating in two modes

Mode1:Alerting if someone’s come close to the person.

Mode2: Measuring the temperature and the distance.

3.To formulate a system which works with the components available to produce the above desire results and evaluate its effectiveness.

CHAPTER 4

COMPONENTS AND COST

Components	Cost
AURDINO UNO	Rs 400
ULTRASONIC SENSOR	Rs 175
TOUCH SENSOR	Rs 50
BUZZER	Rs 50
JUMPING WIRES	Rs 100
ROTARY POTENTIOMETER	Rs 120
BREADBOARD	Rs 100
LCD DISPLAY	Rs 100
TOTAL	Rs1100

Table 4.1: components and cost

CHAPTER 5

METHODOLOGY

1].CIRCUITINTERFACING :

The aurdino measures the temperature. The temperature is used to calculate the distance with greater accuracy.

If the aurdino is on mode 1:If the distance is between 2m and 1m, the LCD back-light lights up and the LCD shows “please keep away” and how far away the person is. If the distance is 1m to 50cm the back light off the LCD flashes and LCD shows “keep away ”. If the distance is less than 50 cm the back light turns off and on twice a second and the LCD shows “stay away ”. If the aurdino is on mode 2:The LCD shows the distance on the top and the temperature on the bottom of the screen.

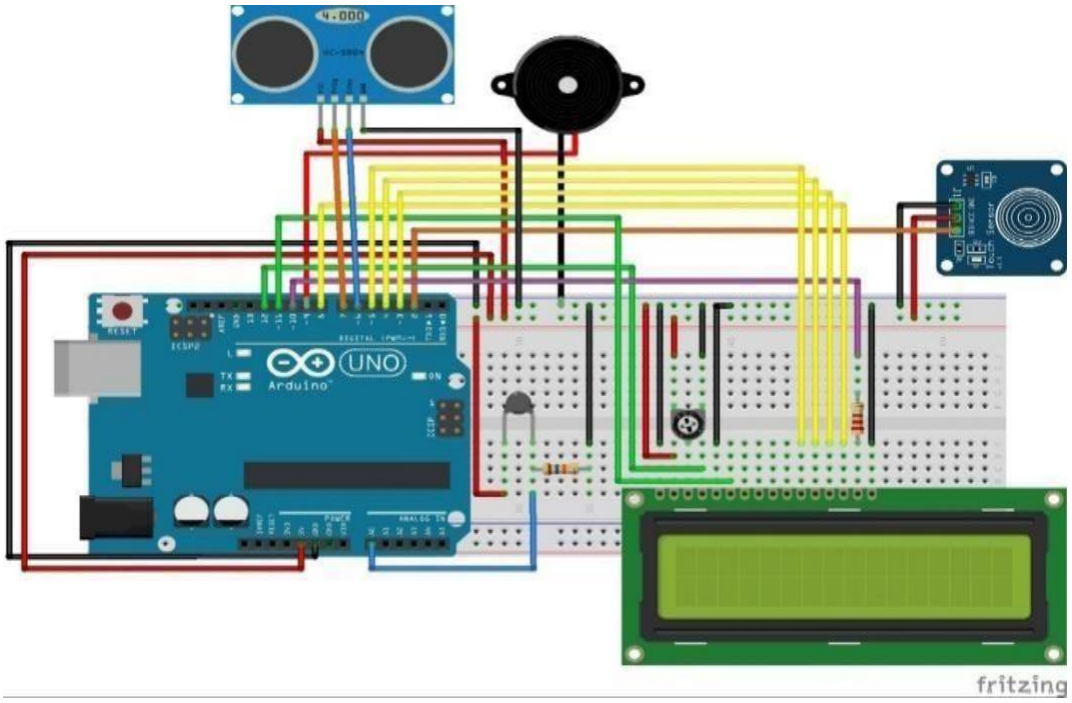

Fig 5.1: circuit interfacing

2]Workflow:

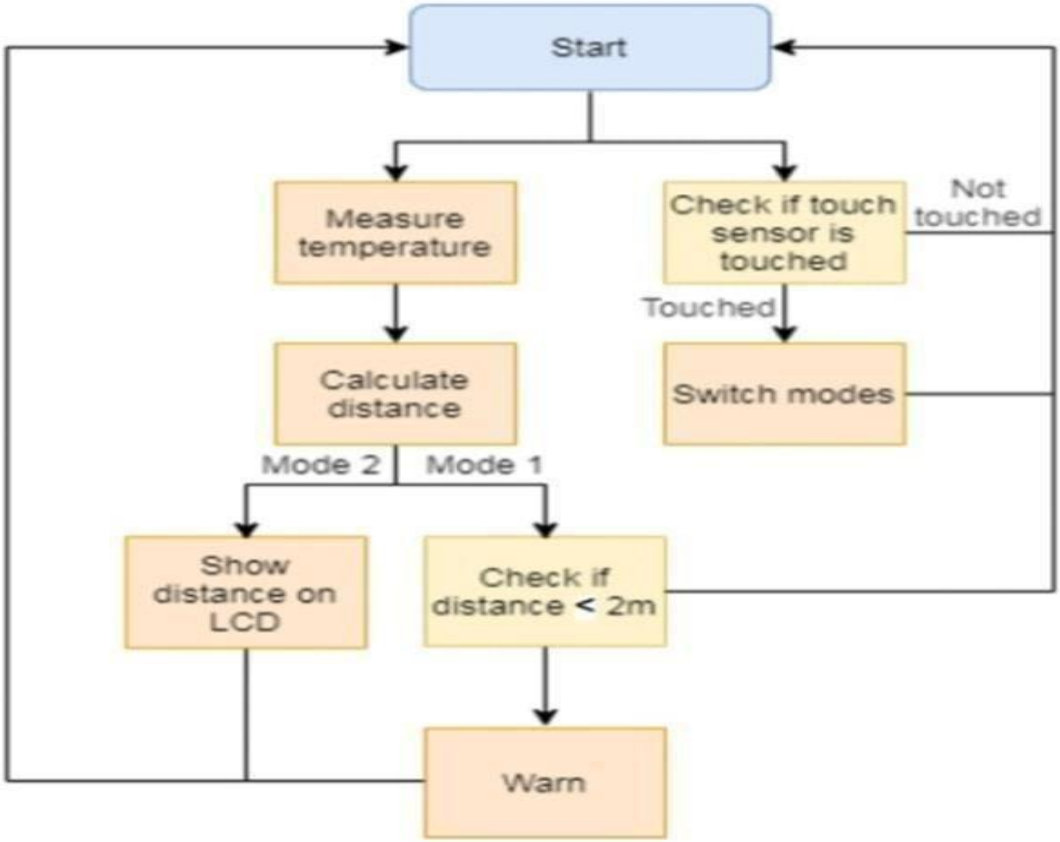

Fig 5.2: A simplified algorithm

3] SOFTWARE USED:

Arduino IDE software

• It is used for writing code, compiling the code to check if any errors are there and Uploading the code to the Arduino.

• It is a cross-platform software which is available for every Operating System like Windows, Linux, macOS. It supports C/C++ language.

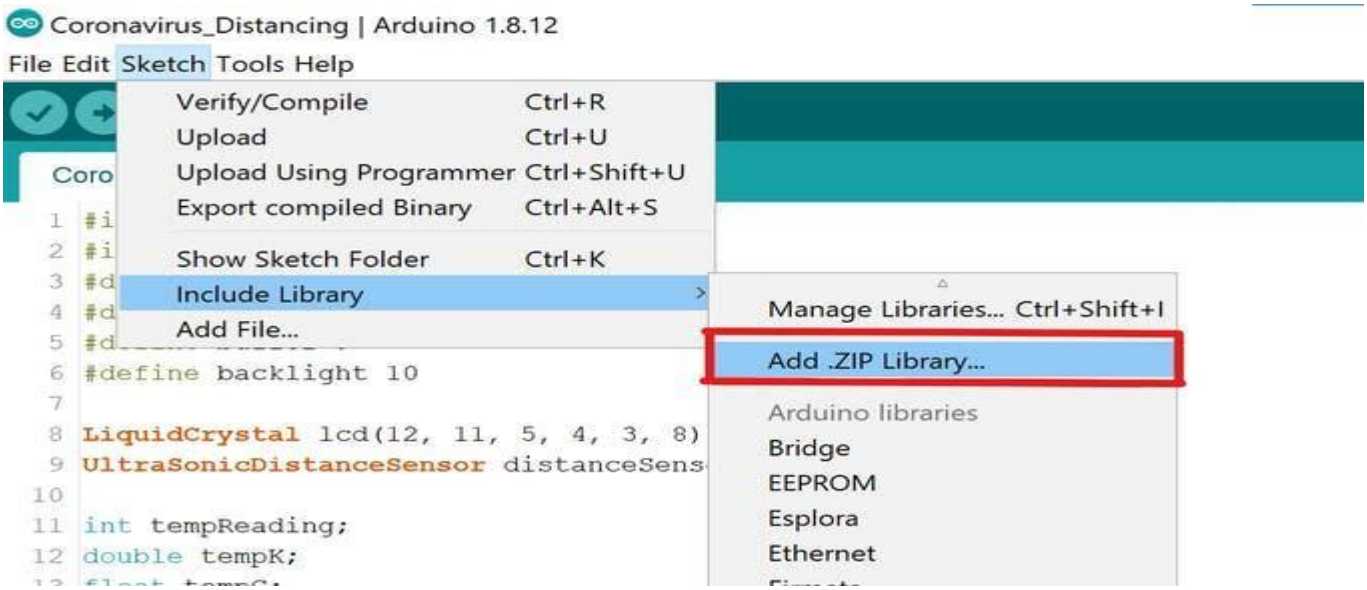

Fig 5.3: Importing a library

After importing the library ,we can upload the code to the aurdino uno board.

CHAPTER 6

RESULTS

When the hardware connections and software are ready, just run the aurdino code (given below) on the computer . It will print the value of temperature read from the sensor and the distance between the person. If the distance is very less the buzzer is on and alerts the person to keep away .

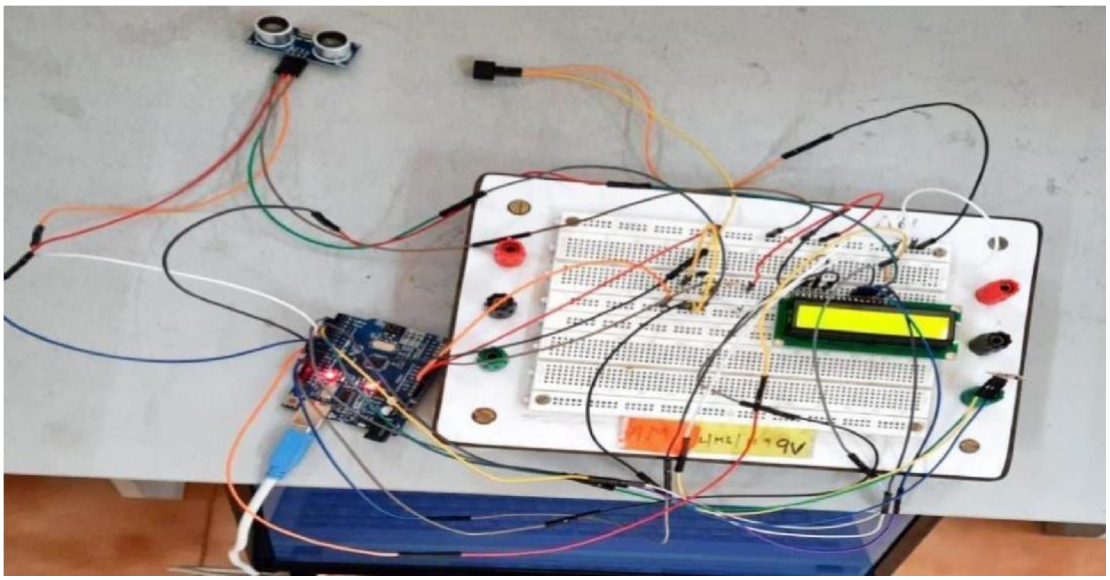

Fig 6.1 Hardware connections

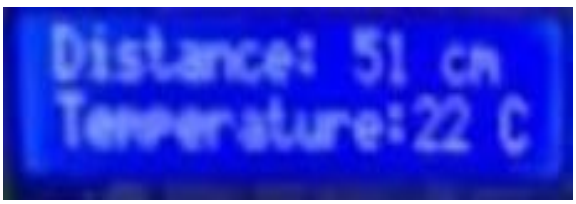

Fig 6.2:Distance and temperature Lcd

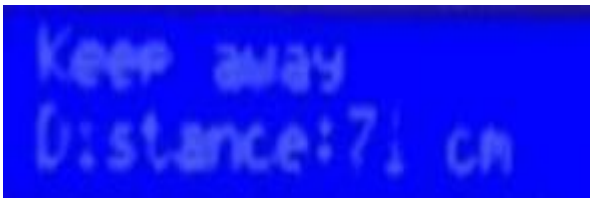

Fig 6.3:Messages displayed on lcd

CHAPTER 7

CONCLUSION AND DISCUSSION

Our device is user-friendly and compatible for all age groups. It can be easily carried by the user. Aurdinounosoftware help the user to run the code and alert the people to maintain a 2-meter distance by measuring the distance and temperature. Thus prevent the spreading of COVID 19 virus.

❖ FUTURE SCOPE:

1.To make the device as a wearable product.
2.Identify the person who is not following social distancing.
3.Recognize the person who has high temperature.

CHAPTER 8

REFERENCES

1) M. Cristani, A. D. Bue, V. Murino, F. Setti and A. Vinciarelli, “The Visual Social Distancing Problem,” in IEEE Access, vol. 8, pp. 126876.

2) A. H. Ahamad, N. Zaini and M. F. A. Latip, "Person Detection for Social Distancing and Safety Violation Alert based on Segmented ROI," 2020 10th IEEE International Conference on Control System, Computing and Engineering (ICCSCE), Penang, Malaysia, 2020, pp. 113118, doi:10.1109/ICCSCE50387.2020.9204934.

3) D. Garg, P. Goel, S. Pandya, A. Ganatra and K. Kotecha, "A Deep Learning Approach for Face Detection using YOLO," 2018 IEEE Punecon, Pune, India, 2018, pp. 1-4, doi:10.1109/PUNECON.2018.8745376.

4) Vaid, S., Kalantar, R. & Bhandari, M. Deep learning COVID-19 detection bias: accuracy through artificial intelligence. International Orthopaedics (SICOT) 44,

5) M. Cristani, A. D. Bue, V. Murino, F. Setti and A. Vinciarelli, "The Visual Social Distancing Problem, in IEEE Access, vol. 8

6) Sohan, M.F. (2020). So You Need Datasets for Your COVID-19 Detection Research Using Machine Learning? ArXiv, abs/2008.05906

7) M. Matsumoto, K. Kaneta, M. Naruoka, H. Tanaka and K. Takano, "Tracking Positions of Human body Parts Based on Distance Measurement with Sound Wave,” 2017 31st International Conference on Advanced Information Networking and Applications Workshops (WAINA), Taipei, 2017, pp. 514-518, doi: 10.1109/WAINA.2017.135.

8) M. Hatt, C. Parmar, J. Qi and I. El Naqa, "Machine (Deep) Learning Methods for Image Processing and Radiomics," in IEEE Transactions on Radiation and Plasma Medical Sciences, vol. 3, no. 2, pp.1108, March 2019, doi: 10.1109/TRPMS.2019.2899538.

CHAPTER 9

APPENDIX

HC-SR04 Sensor Features

Operating voltage: +5V
Theoretical Measuring Distance: 2cm to 450
Practical Measuring Distance: 2cm to 80cm
Accuracy: 3mm
Measuring angle covered: <15°
Operating Current: <15mA
Operating Frequency: 40Hz

Specification of arduinouno microcontroller:

Microcontroller: Microchip ATmega328P[7]
Operating Voltage: 5 Volts
Input Voltage: 7 to 20 Volts
Digital I/O Pins: 14
PWM Pins: 6 (Pin # 3, 5, 6, 9, 10 and 11)[9]
UART: 1
I2C: 1
SPI: 1
Analog Input Pins: 6
DC Current per I/O Pin: 20 mA
DC Current for 3.3V Pin: 50 mA
Flash Memory: 32 KB of which 0.5 KB used by bootloader
SRAM: 2 KB
EEPROM: 1 KB
Clock Speed: 16 MHz
Length: 68.6 mm
Width: 53.4 mm
Weight: 25 g
ICSP Header: Yes
Power Sources: DC Power Jack & USB Port

Code

```
#include <HCSR04.h>
#include <LiquidCrystal.h>
#define trigPin 7
#define echoPin 6
#define buzzer 9
#define backlight 10

LiquidCrystallcd(12, 11, 5, 4, 3, 8);
UltraSonicDistanceSensordistanceSensor(trigPin, echoPin);

InttempReading;
Double tempK;
Float tempC;
Int rounded;
Inttemp_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);
}
```