A Theme Based Project Report

on

COVID SAFE ROOM

Submitted in partial fulfilment of the

Requirements for the award of the Degree of

BACHELOR OF ENGINEERING

IN

COMPUTER SCIENCE & ENGINEERING

BY

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DECLARATION BY THE CANDIDATE

We, **THUMMALAPALLI SHREYA and T SAI VARSHINI,** bearing hall ticket numbers, **1602-19-733-165 and 1602-19-733-160**, hereby declare that the project report entitled **"COVID SAFE ROOM"** Department of Computer Science & Engineering, VCE, Hyderabad, is submitted in partial fulfilment of the requirement for the award of the degree of **Bachelor of Engineering** in **Computer Science & Engineering**.

This is a record of bonafide work carried out by us and the results embodied in this project report have not been submitted to any other university or institute for the award of any other degree or diploma.

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BONAFIDE CERTIFICATE

This is to certify that the project entitled **"COVID SAFE ROOM"** being submitted by **THUMMALAPALLI SHREYA and T SAI VARSHINI,** bearing **1602-19-733-165 and 1602-19-733-160,** in partial fulfilment of therequirements for the award of the degree of Bachelor of Engineering in Computer Science & Engineering is a record of bonafide work carried out by him/her under my guidance.

Mr. P. Narsaiah

Assistant Professor

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ACKNOWLEDGEMENT

With immense pleasure, we record our deep sense of gratitude to our guide Mr. P. Narsaiah, Assistant Professor, Vasavi College of Engineering, Hyderabad, for the valuable guidance and suggestions, keen interest and thorough encouragement extended throughout the period of the project work. I consider myself lucky enough to be part of this project. This project would add as an asset to my academic profile.

We express our thanks to all those who contributed for the successful completion of our project work.

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1. ABSTRACT

COVID 19 has made a huge impact on the society, the new restriction has been imposed as in the number of users allowed in a particular room in offices, shops, etc. to maintain social distancing, along with social distancing regular temperature check at entrances of malls, the office is mandatory. In this project we stimulate a room where such necessary precautions are taken, we make use of a laser diode and receiver to detect the entrance of a person, when the project detect entrance it will check the temperature of the person if the temperature is less than the set temperature the person is allowed entry otherwise the entry is denied. only a pre-determined number of people are allowed in the room. The allowed temperature, the number of people allowed in the room as well as the number of people actively present in the room can be set/viewed using a Bluetooth App.

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3. INTRODUCTION

The worldwide spread of COVID-19 has forced us to adapt to a new way of life made of social distancing, avoidance of physical contact, and temperature checks before entering public places, to successfully limit the virus circulation. They are, in fact, very versatile devices that allow performing contactless human body temperature measurements, presence detection and people counting, and automation of appliances and systems, thus avoiding the need to touch them. As states and communities implement reopening plans during the COVID-19 pandemic, non-contact temperature assessment devices may be used as part of an initial check at entry points to identify and triage people who may have elevated temperatures. COVID 19 has had a significant impact on society; new restrictions have been imposed on the number of users allowed in a particular room in offices, shops, and other establishments to maintain social distancing; in addition to social distancing, regular temperature checks at the mall and office entrances are required. In this project, we stimulate a room where such precautions are taken, and we use an IR sensor to detect a person's entrance. When the project detects entrance, it checks the person's temperature; if the temperature is less than the set temperature, the person is allowed entry; otherwise, entry is denied. Only a certain number of persons are permitted to enter the room. A Bluetooth App may be used to set/view the permissible temperature, the number of persons allowed in the room, and the number of people actively present in the room.

3.1 OVERVIEW

This project uses two ultrasonic sensors to detect the persons entering and exiting the room. At the entrance gate, we put a pir sensor. A servo motor can be used to lift the gate up and down during the entry and exit of the persons. Another pir sensor is kept the exit gate. This is used to count the persons exiting the gate. At the entrance gate we also check the temperature of the person. If temperature exceeds the average body temperature it is classifies as fever and the person is not allowed.

3.2 METHODOLOGY

In this system, we use a lcd to display the number of people in the room. Initially, a variable count is initialized to zero. Every time, the pir sensor at the entry gate detects a person the count is incremented. This count is displayed on the lcd. When the person is detected on the exit pir sensor the count variable is decremented. A temperature sensor is used to check the temperature of the persons entering. If the temperature exceeds the average human temperature, then the entry is denied. If the number of persons exceeds the limit, then the entry is denied. The numbers of people in the room are displayed on the lcd. The temperature of the person who recently entered the room is displayed on the temperature.

4.COMPONENTS USED

1. ARDUINO UNO

Arduino is an open source hardware platform that is readily available for hobbyists & enthusiasts across the globe to build projects. It comes with an ATMEGA microcontroller that processes the data and facilitates the proper working of the IoT system.

FIGURE 2.1

2. PIR SENSOR:

A passive infrared sensor (PIR sensor) is an electronic sensor that measures infrared (IR) light radiating from objects in its field of view. They are most often used in PIR-based motion detectors. PIR sensors are commonly used in security alarms and automatic lighting applications. PIR sensors detect general movement, but do not give information on who or what moved. For that purpose, an imaging IR sensor is required.

FIGURE 2.2

3. LCD:

LCD (Liquid Crystal Display) is a type of flat panel display which uses liquid crystals in its primary form of operation. LEDs have a large and varying set of use cases for consumers and businesses, as they can be commonly found in smartphones, televisions, computer monitors and instrument panels.

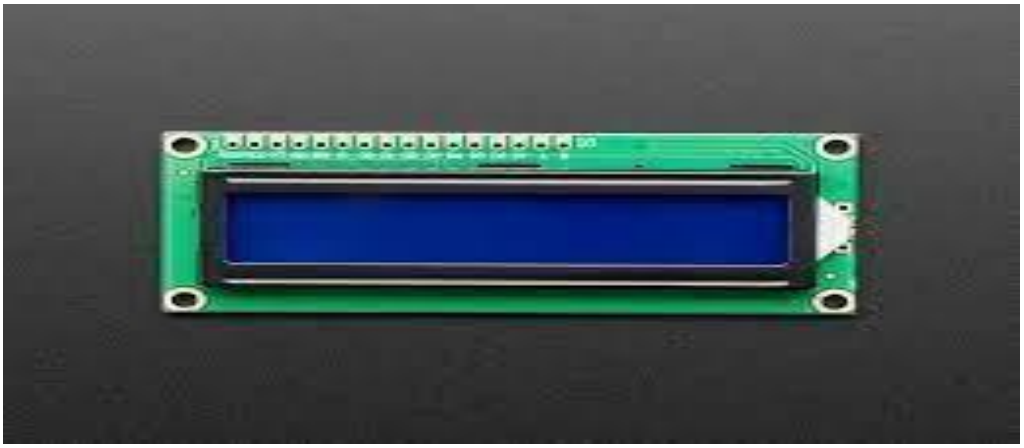


FIGURE 2.3

4. SERVO MOTOR:

A servo motor is a rotary actuator that allows for precise control of angular position. It consists of a motor coupled to a sensor for position feedback. It also requires a servo drive to complete the system. The drive uses the feedback sensor to precisely control the rotary position of the motor.

FIGURE 2.4

5.NON CONTACT TEMPERATURE DETECTION SENSOR

The MLX90614 is an infrared thermometer for non-contact temperature measurements. Both the IR sensitive thermopile detector chip and the signal conditioning ASIC are integrated in the same TO-39 can. Integrated into the MLX90614 are a low noise amplifier, 17-bit ADC and powerful DSP unit thus achieving high accuracy and resolution of the thermometer.

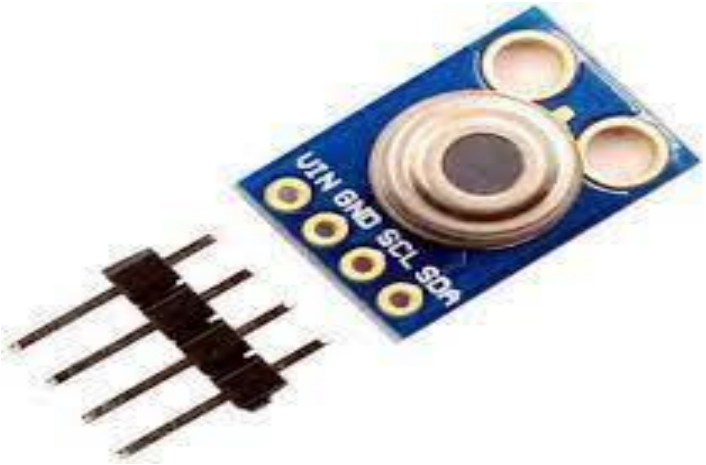


FIGURE 2.5

5. CIRCUIT DIAGRAM:

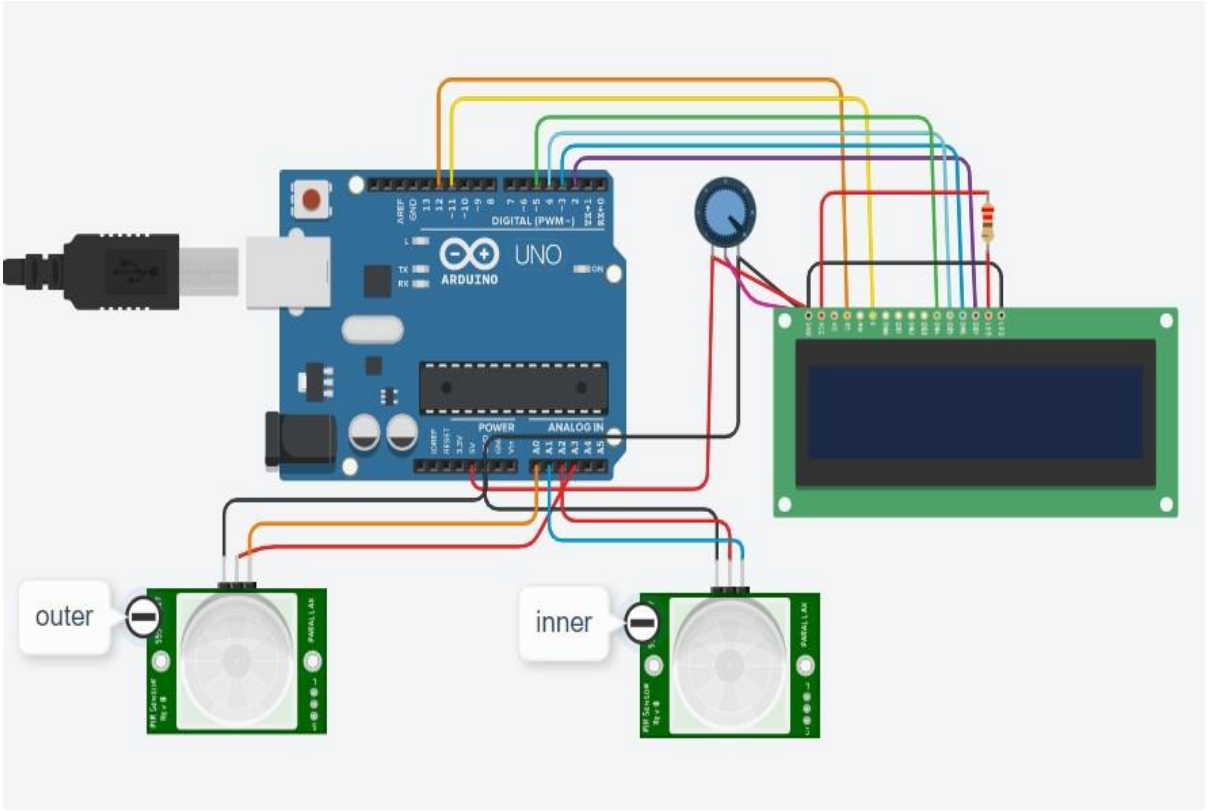


FIGURE 2.6

6. SYSTEM REQUIREMENTS

Hardware:

- Arduino UNO
- PIR sensor
- Servo Motor
- Non Contact Temperature Sensor
- Input devices: Mouse, Keyboard
- Output devices: LCD

Software:

- Chrome 76.0 or above
- Windows 7 or above

7. IMPLEMENTATION:

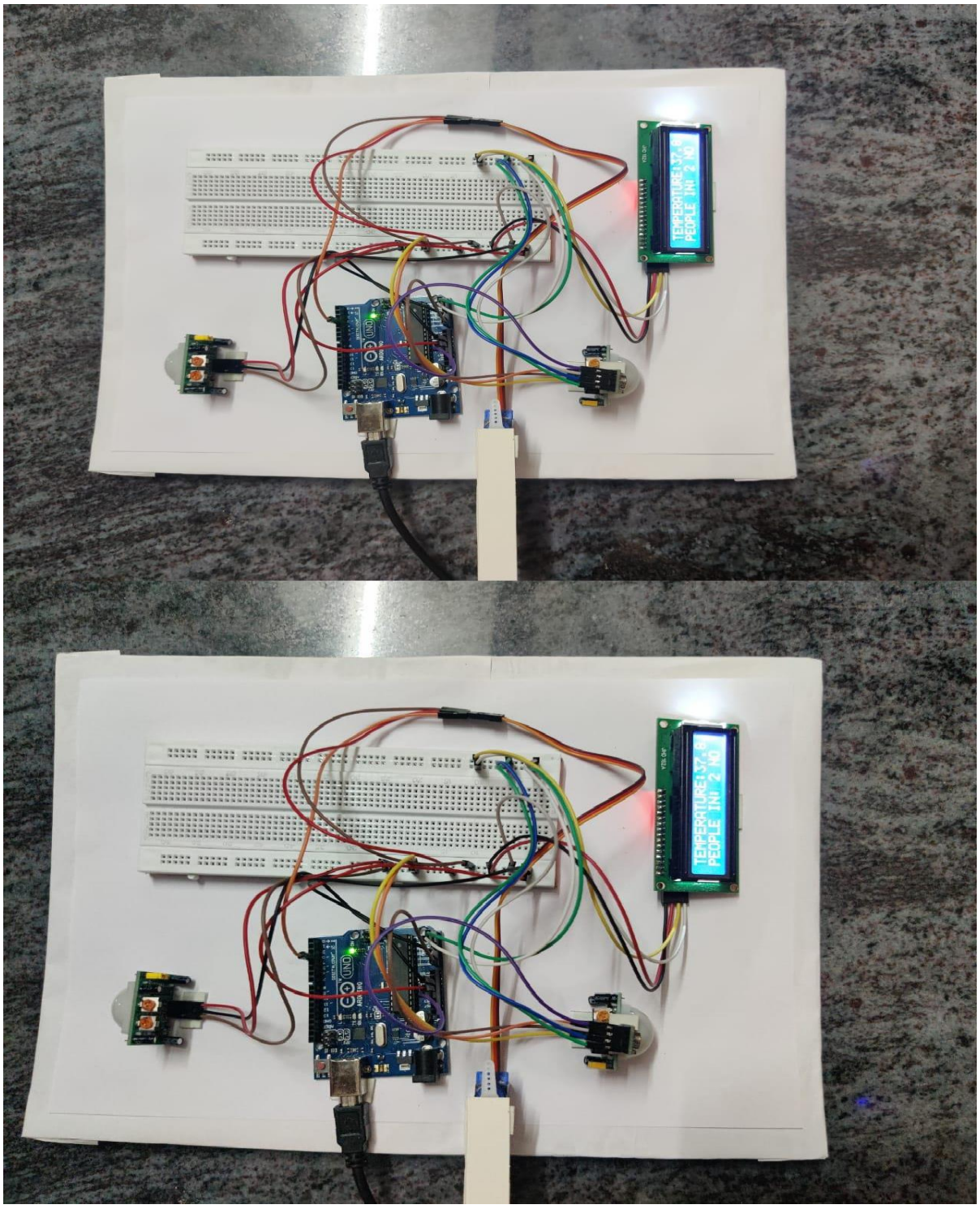
```
#include <LiquidCrystal_I2C.h>
#include<Wire.h>
#include<Servo.h>
#include <Adafruit_MLX90614.h>
Adafruit_MLX90614 mlx = Adafruit_MLX90614();
int in = 15;
int inpr = 16;
int out = 14;
int outpr = 17;
int ppl = 0;
int flag=0;
//LiquidCrystal lcd(12, 11, 5, 4, 3, 2);
LiquidCrystal_I2C lcd(0x27,16,2);
bool pi = 0;
bool po = 0;
Servo s1;
void setup() {
  pinMode(15, INPUT);
  pinMode(14, INPUT);
  pinMode(16, OUTPUT);
  pinMode(17, OUTPUT);
  lcd.init();
  lcd.backlight();
  lcd.print("TEMPERATURE:");
```

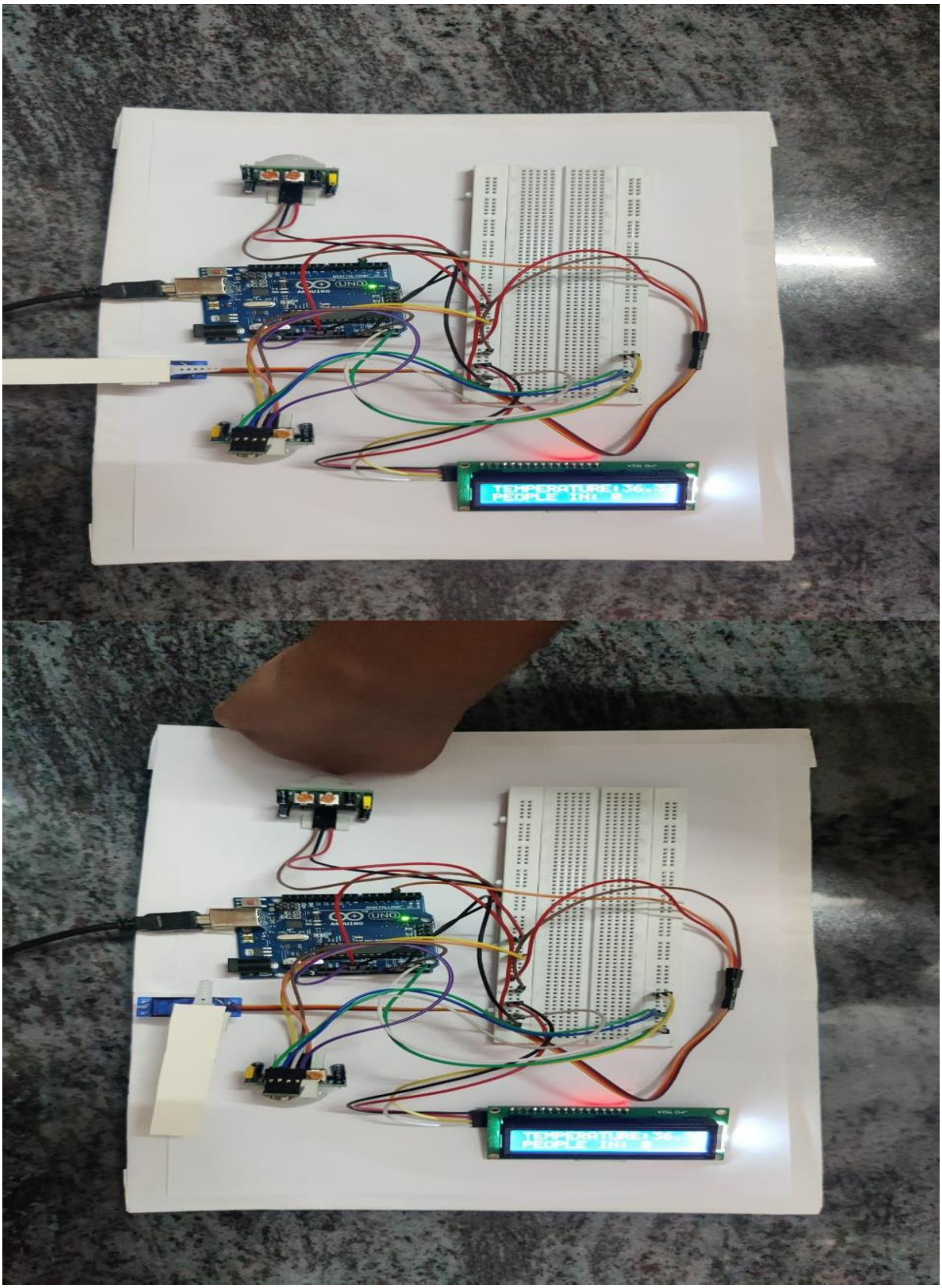
```
  lcd.setCursor(0, 1);
  lcd.print("PEOPLE IN:");
  s1.attach(3);
  s1.write(0);
  Serial.begin(9600);
  mlx.begin();
}

void loop() {
  digitalWrite(outpr, HIGH);
  digitalWrite(inpr, HIGH);
  pi = digitalRead(in);
  po = digitalRead(out);


  if (po == 1){
     if(((mlx.readObjectTempC())>=36) && ((mlx.readObjectTempC())<38)){
        ppl++ ;
        flag=1;
        lcd.setCursor(12,0);
        lcd.print(mlx.readObjectTempC());
        //delay(500);
     }
  }
    if (pi == 1 && (ppl>0 && ppl<3)){
```

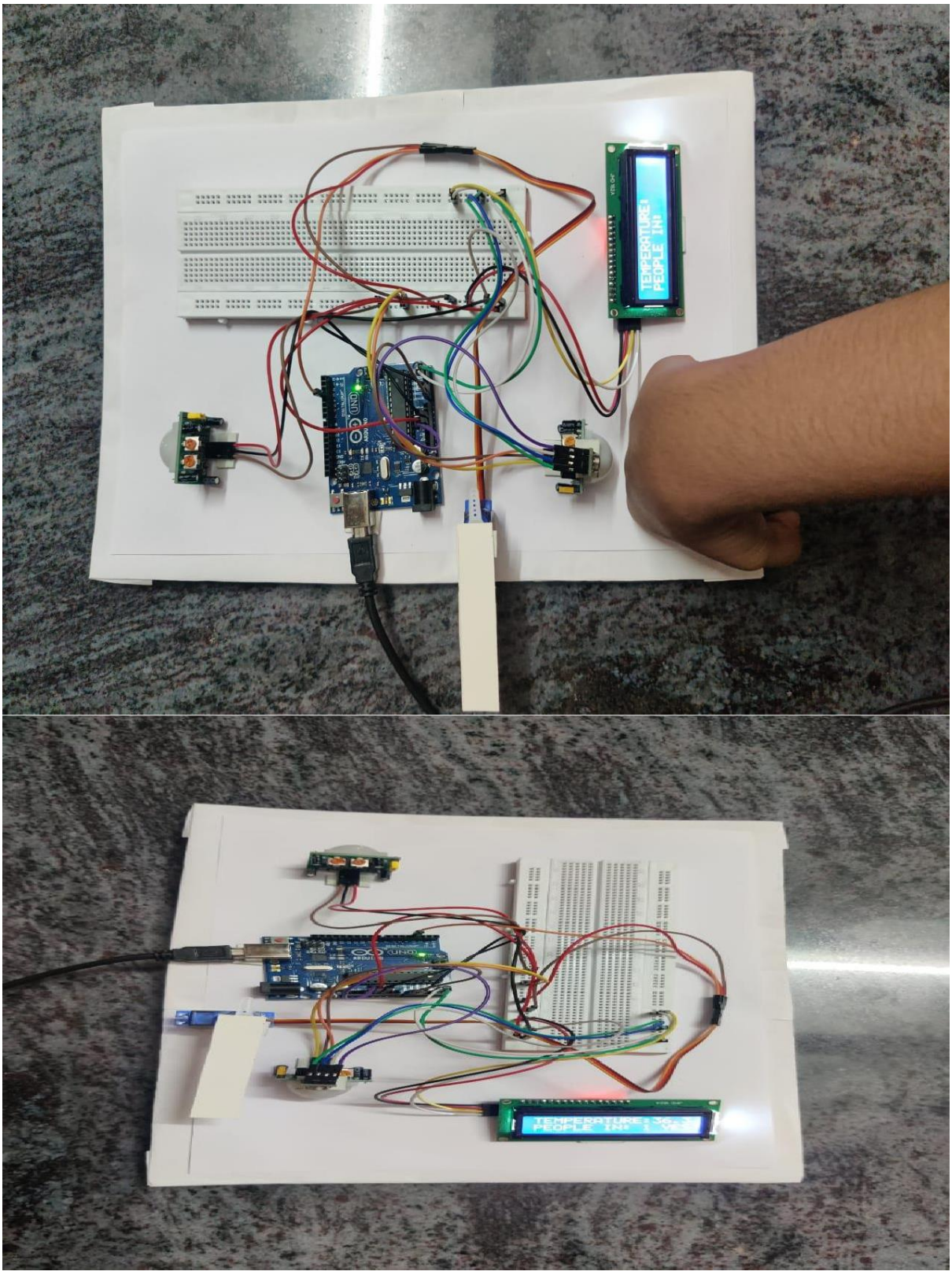
```
  ppl--;
  flag=1;
  lcd.setCursor(11,1);
  lcd.print(ppl);
  lcd.setCursor(13,1);
  lcd.print(" ");
  delay(1000);
      s1.write(90);
      delay(2000);
      s1.write(0);
  //delay(500);
}
ppl = constrain(ppl, 0, 50);

if (flag == 1 &&  ppl <= 2){
    if(((mlx.readObjectTempC())>=36) && ((mlx.readObjectTempC())<38)){
      lcd.setCursor(11,1);
      lcd.print(ppl);
      lcd.setCursor(13,1);
      lcd.print("YES");
      delay(1000);
      s1.write(90);
      delay(2000);
      s1.write(0);
      flag=0;
```

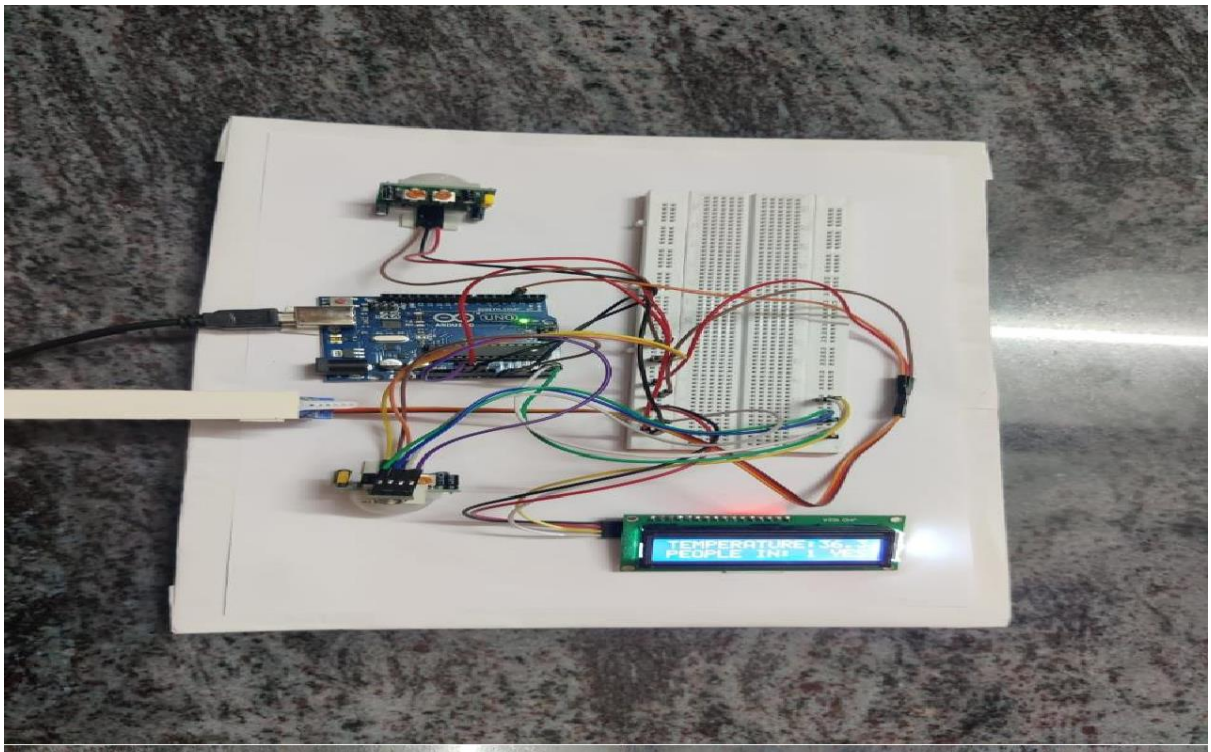
```
    }
  }
  else if(ppl==0){
    lcd.setCursor(13,1);
    lcd.print("  ");
  }
  else if( ppl>=3 ){
    if(((mlx.readObjectTempC())<36) || ((mlx.readObjectTempC())>=38)){
      lcd.setCursor(13,1);
     lcd.print("NO ");
     //delay(500);
  }
  }
  delay(500);
}
```

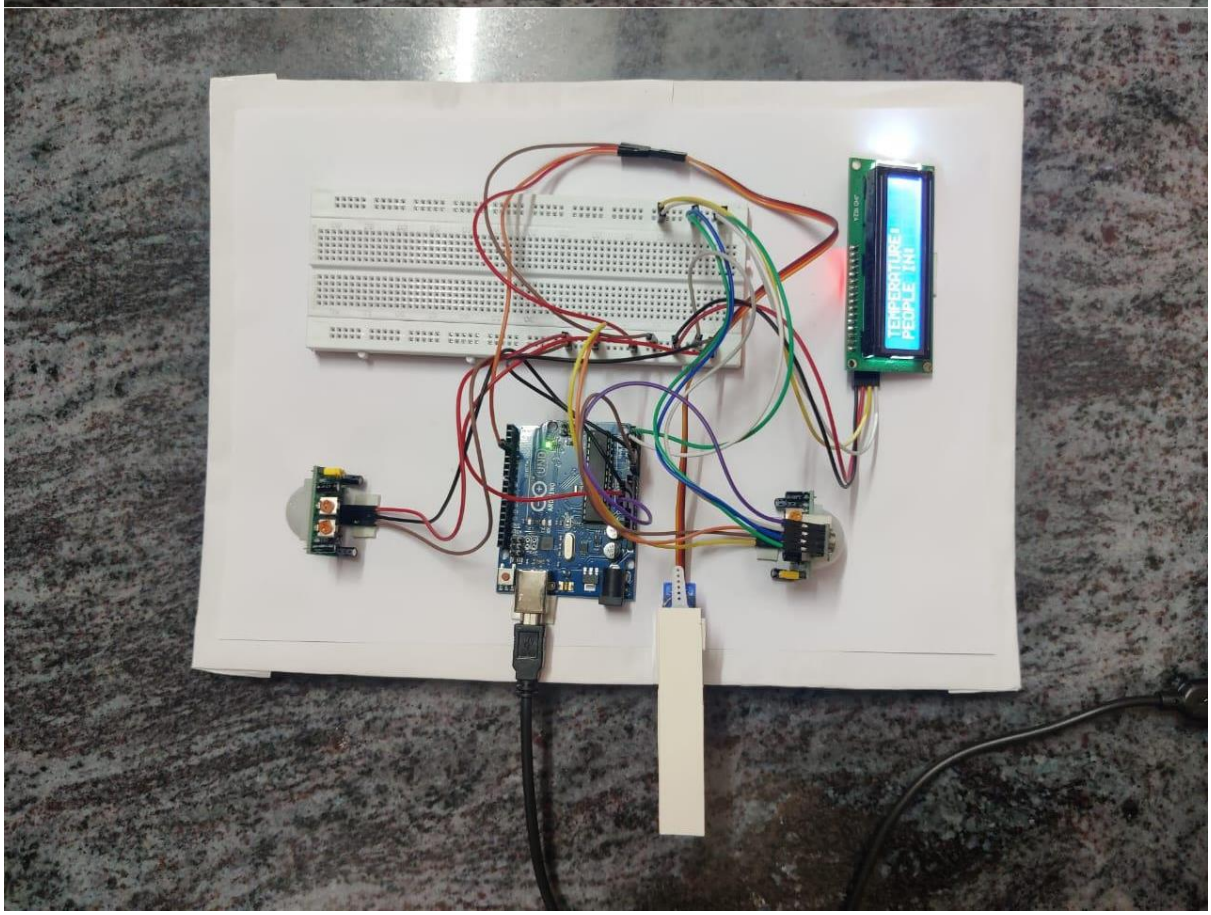
8. OUTPUT:






TEMPERATURE:
PEOPLE IN:


TEMPERATURE
PEOPLE IN


TEMPERATURE
PEOPLE IN

9. CONCLUSION AND FUTURE WORK

The main of this project to enhance the precautions taken for a public meeting during the pandemic times without any manpower. This is very useful in public places, especially in places where there is more crowd. When there is heavier flow of a people it becomes difficult for normal human to measure the temperature of each and every person, In those cases this project can be very useful.

In future this project can be expanded by allowing the system to detect age, gender and many more for statistical references. Elements of Artificial Intelligence can also be included in this project.

10. REFERENCES

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