

Automatic Room Temperature Controller

IOT, ROBOTICS, EMBEDDED SYSTEMS

Internship Project-1

BACHELOR OF TECHNOLOGY

(ELECTRONICS AND COMMUNICATION ENGINEERING)

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ABSTRACT:

In this project we have seen how to build a automatic room temperature controller system. By this project we can control the temperature of the room and to maintain the temperature of a room to a constant temperature. This project is very useful to all the people because in winter season the temperatures will fall drastically to a very low temperatures at that we need to turn on the heater and in summer seasons the temperatures increases drastically so we need to turn on cooler to reduce the temperature and to maintain the temperature to a constant. By this project we can automatically turn on the heater in winter season and we can automatically turn on the cooler in summer season.

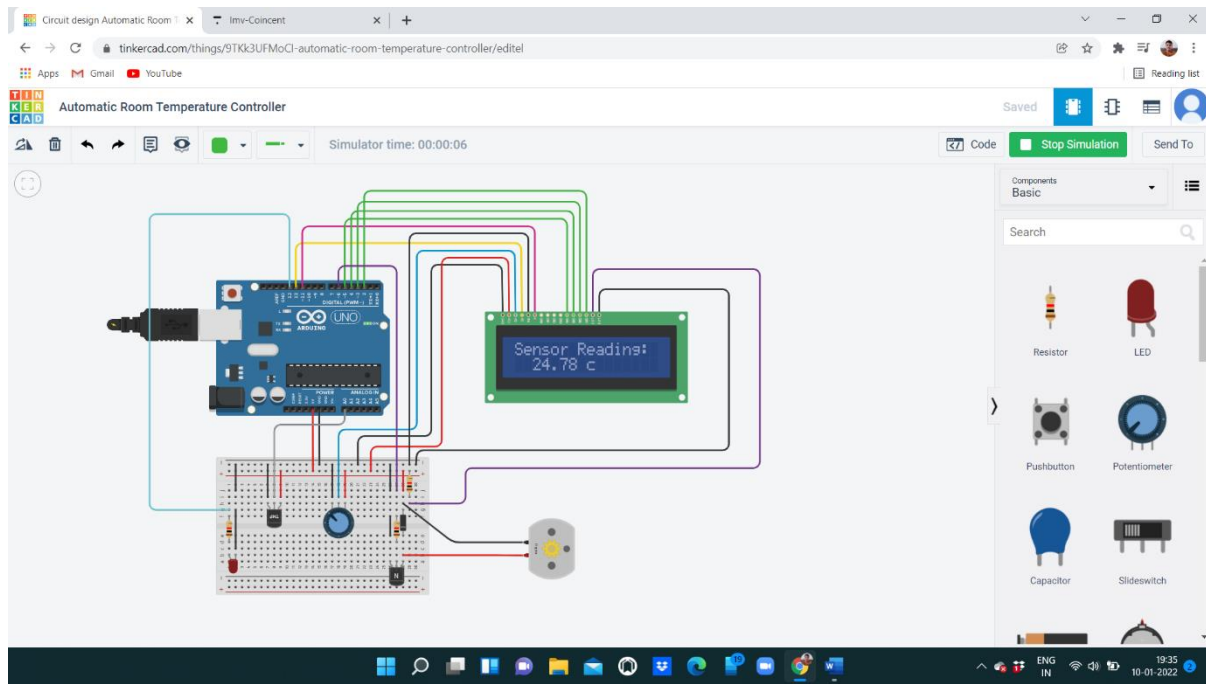
INDRODUCTION:

Automatic room temperature controlling is required in many places such as server rooms, houses, industries, etc. So this project can be very useful in understanding the basics, how you can control the temperature at your home. You can take this project which can be used anywhere. Here the temperature is controlled by using fan and heater. We are going to do this with a temperature sensor. It can be done in various other ways as well. With a thermistor or other sensors like a contactless temperature sensor. But thermistor usually needs contact of the surface and contactless sensors can be costly. In this project, we are going to discuss making a Automatic Room Temperature Controller using Arduino.

As the name implies, a temperature controller is an instrument used to control temperatures, mainly without extensive operator involvement. A controller in a temperature control system will accept a temperature sensor such as a thermocouple as input and compare the actual temperature to the desired control temperature, or setpoint. It will then provide an output to a control element. A good example would be an application where the controller takes an input from a temperature sensor and has an output that is connected to a control element such as a heater or fan. The controller is usually just one part of a temperature control system, and the whole system should be analysed and considered in selecting the proper controller.

METHADODOLOGY:

This is the circuit diagram of the Automatic room temperature controller system.



CODE:

```
const int temp_trans_pin=A0;
const int Heater_pin=13;
const int FAN_pin=6;
//set the range of the desired temperature
float MinTemp=20, MaxTemp=25; //Room Temp[20-25]
#include<LiquidCrystal.h>
LiquidCrystal LCD (12, 11, 5, 4, 3, 2);
void setup(){
LCD.begin(16,2);
pinMode(Heater_pin, OUTPUT);
pinMode(FAN_pin, OUTPUT);
LCD.print("Room Temp(C):");
LCD.setCursor(2,1);
LCD.print(MinTemp); LCD.print("-"); LCD.print(MaxTemp);
delay(2000);
}
void loop(){
float Equ_volt, SensorTemp;
Equ_volt=analogRead(temp_trans_pin)*5.0/1023;
SensorTemp=100.0*Equ_volt-50.0;
LCD.clear();
LCD.print("Sensor Reading: ");
LCD.setCursor(2,1);
LCD.print(SensorTemp); LCD.print(" c");
delay(2000);
if (SensorTemp>MaxTemp){
```

```

    LCD.clear();
    LCD.print("Temp is HIGHER!");
    LCD.setCursor(0,1); LCD.print("Turn on FAN!");
    for (int i=0; i<=255; i++){
        analogWrite(FAN_pin, i);
    }
    delay(2000);
    LCD.clear();
    LCD.print("Now Temp is OK!");
    LCD.setCursor(0,1);
    LCD.print("Turn off FAN!");
    for (int i=255; i>=0; i--){
        analogWrite(FAN_pin, i);
    }
    delay(2000);
}

else if (SensorTemp<MinTemp){
    LCD.clear();
    LCD.print("Temp is LOWER!");
    LCD.setCursor(0,1);
    LCD.print("Turn on HEATER!");
    digitalWrite(Heater_pin, HIGH);
    delay(3000);
    LCD.clear();
    LCD.print("Now Temp is OK!");
    LCD.setCursor(0,1);
    LCD.print("Turn off HEATER!");
    delay(1000);
    digitalWrite(Heater_pin, LOW);
    LCD.clear();
}

else if (SensorTemp>MinTemp &&SensorTemp<MinTemp){
    LCD.clear();
    LCD.print("Now Temp NORMAL!");
    LCD.setCursor(2,1);
    LCD.print("Turn off ALL!");
    delay(1000);
    LCD.clear();
}

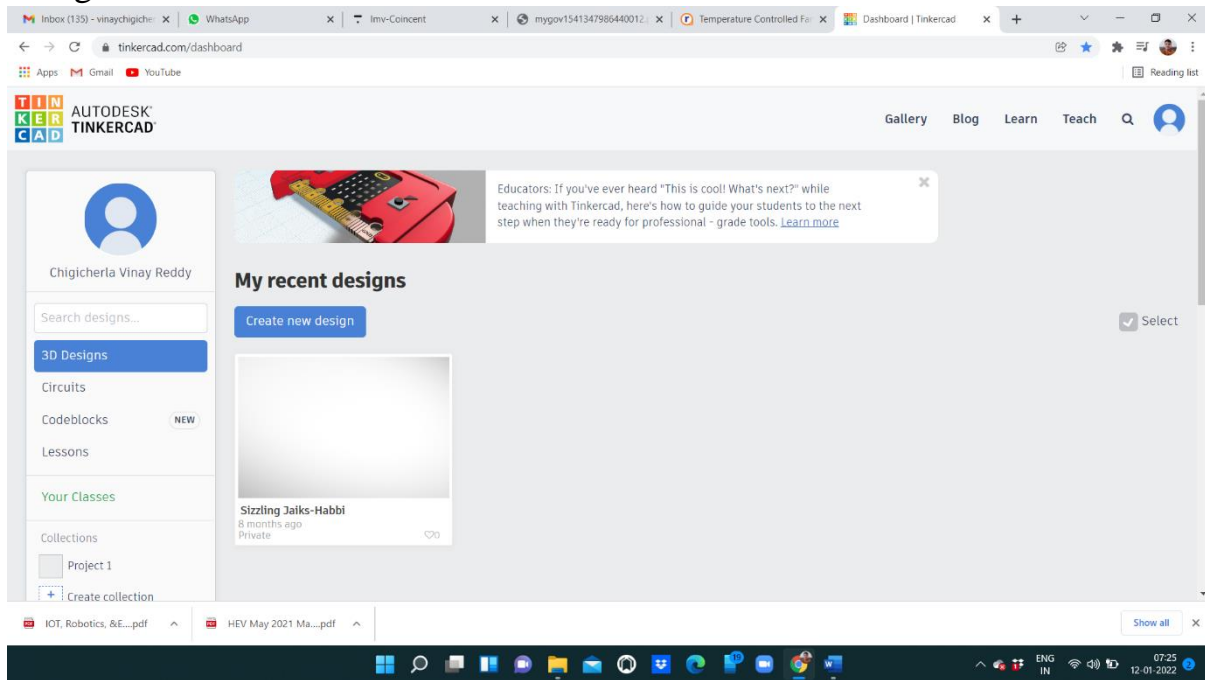
else {
    LCD.clear();
    LCD.print("Something went wrong!");
    LCD.setCursor(2,1);
    LCD.print("Wrong in the circuit!");
    delay(1000);
    LCD.clear();
}

delay(1000);
}

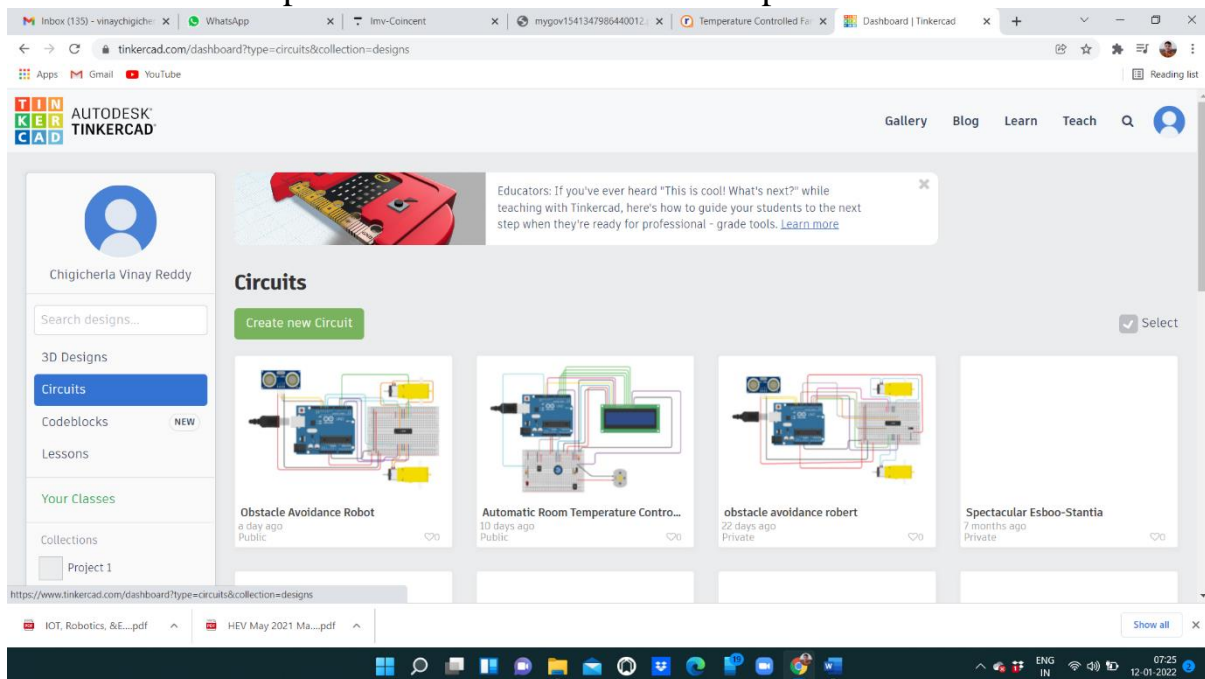
```

Now we discuss How we constructed the circuit and how we stimulated the circuit in a sequence.

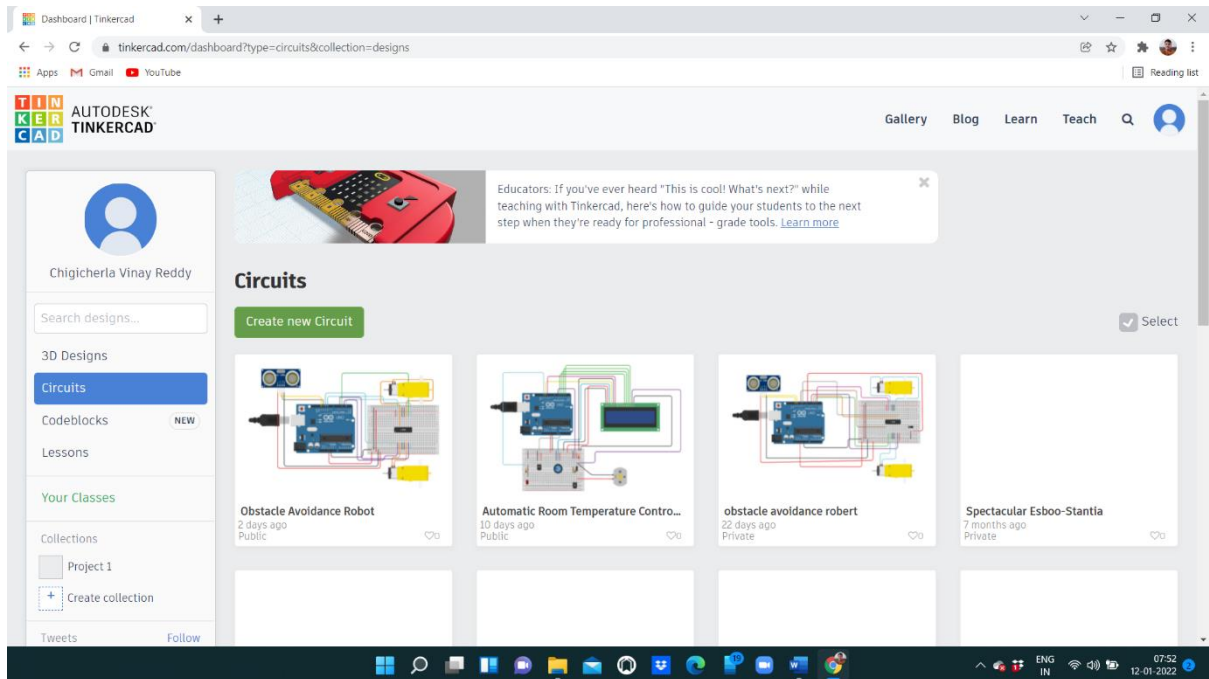
First we have to create the account in the tinkercad using our email and we have to login into the account.



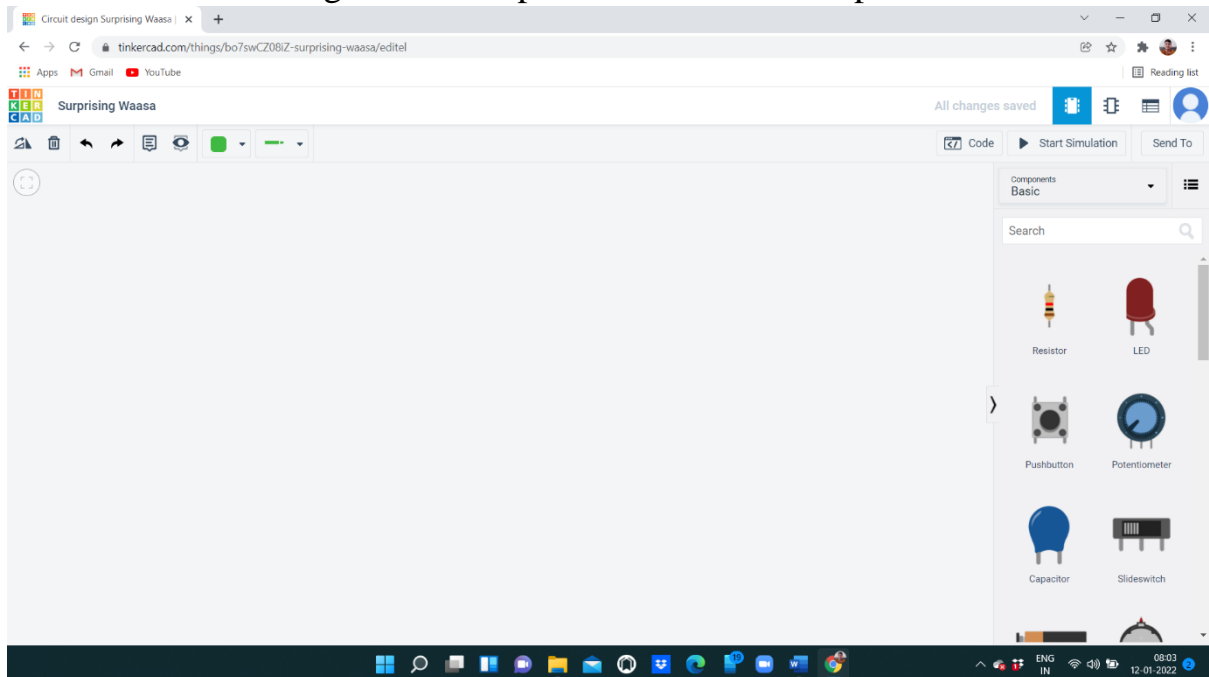
Then we have to open the circuits in the tinkercad platform



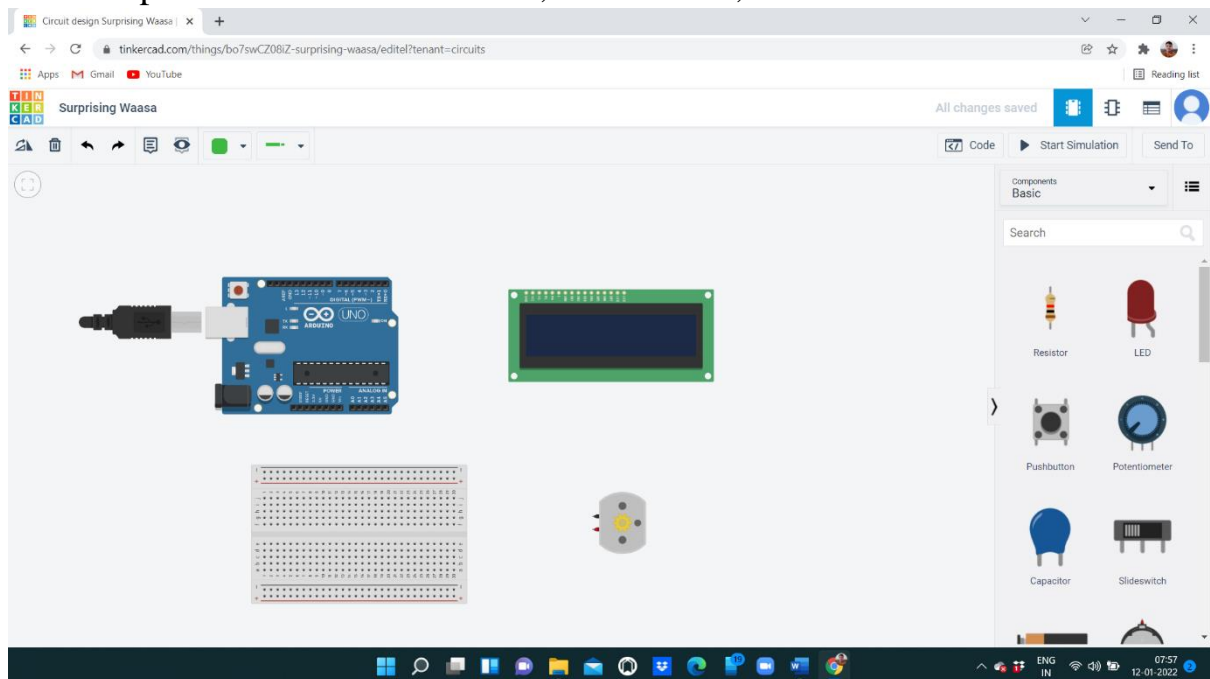
Next we have to click on create new circuit



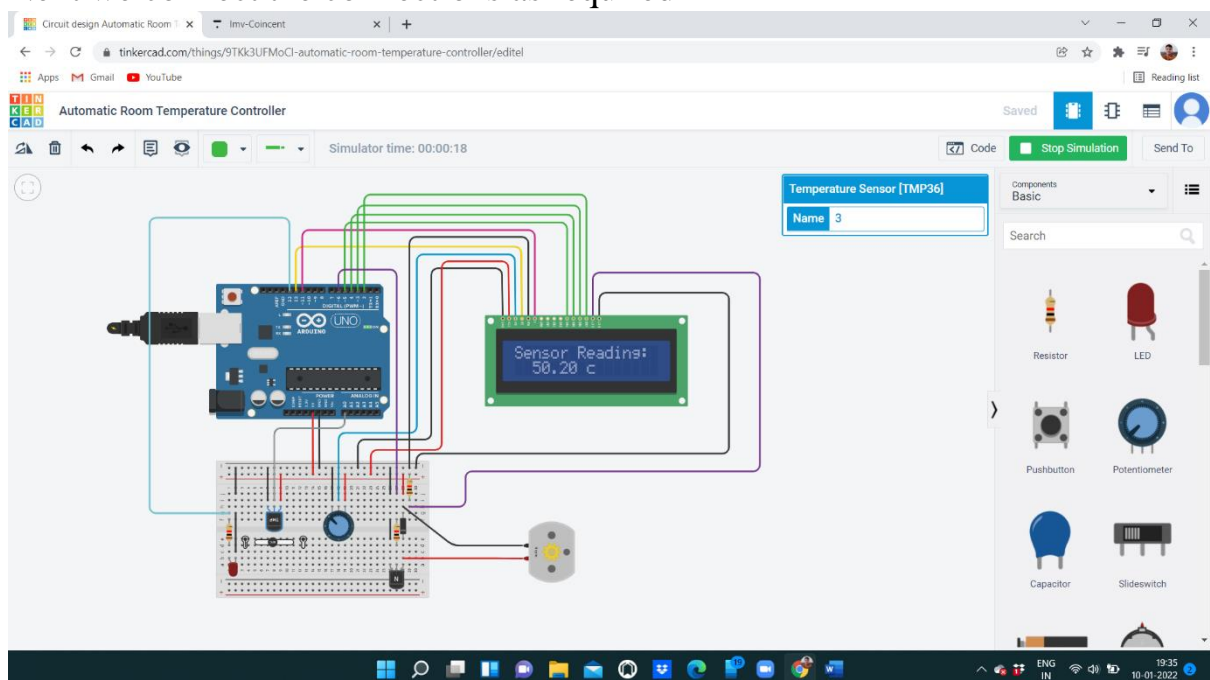
Then we have to bring all the components on to the new platform



The components are Arduino board, bread board, DC motor and LCD screen

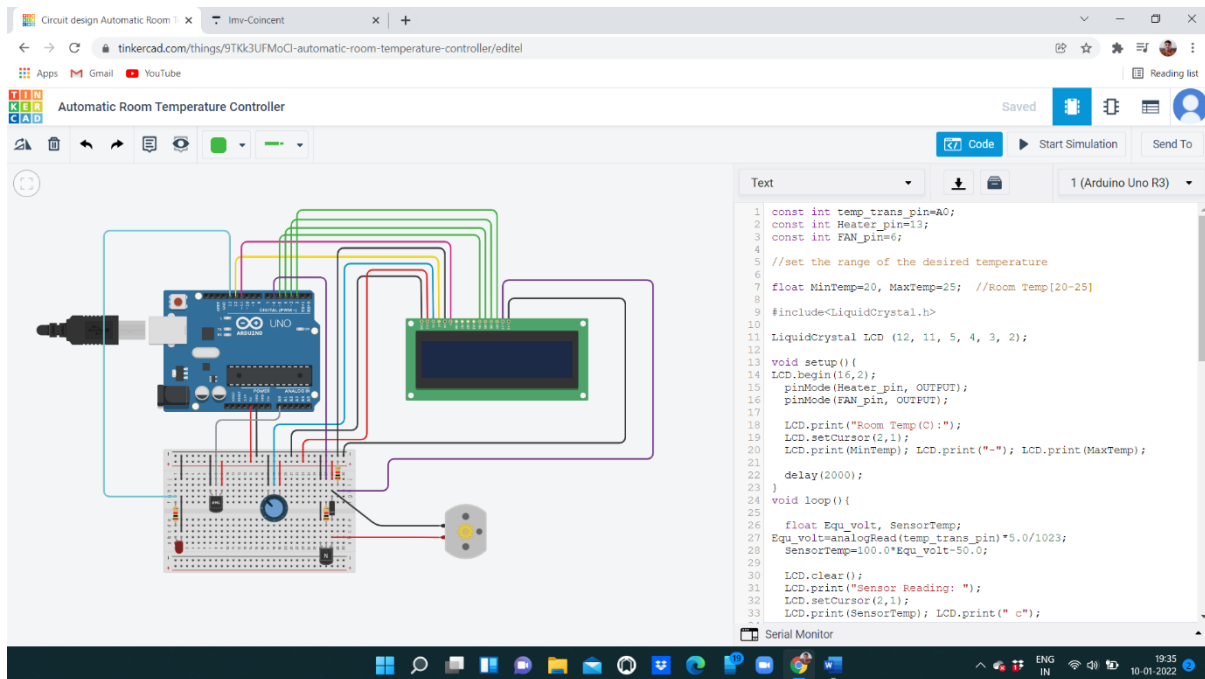


Next we connect the connections as required

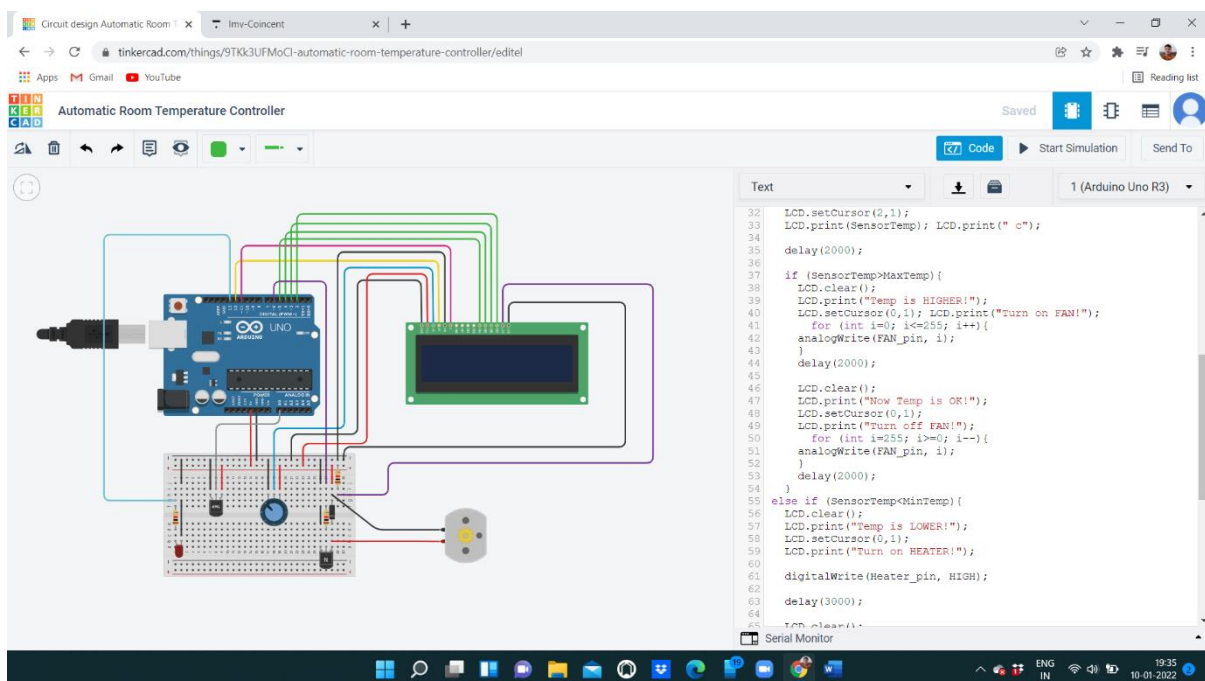


Next we write the code with required logic:

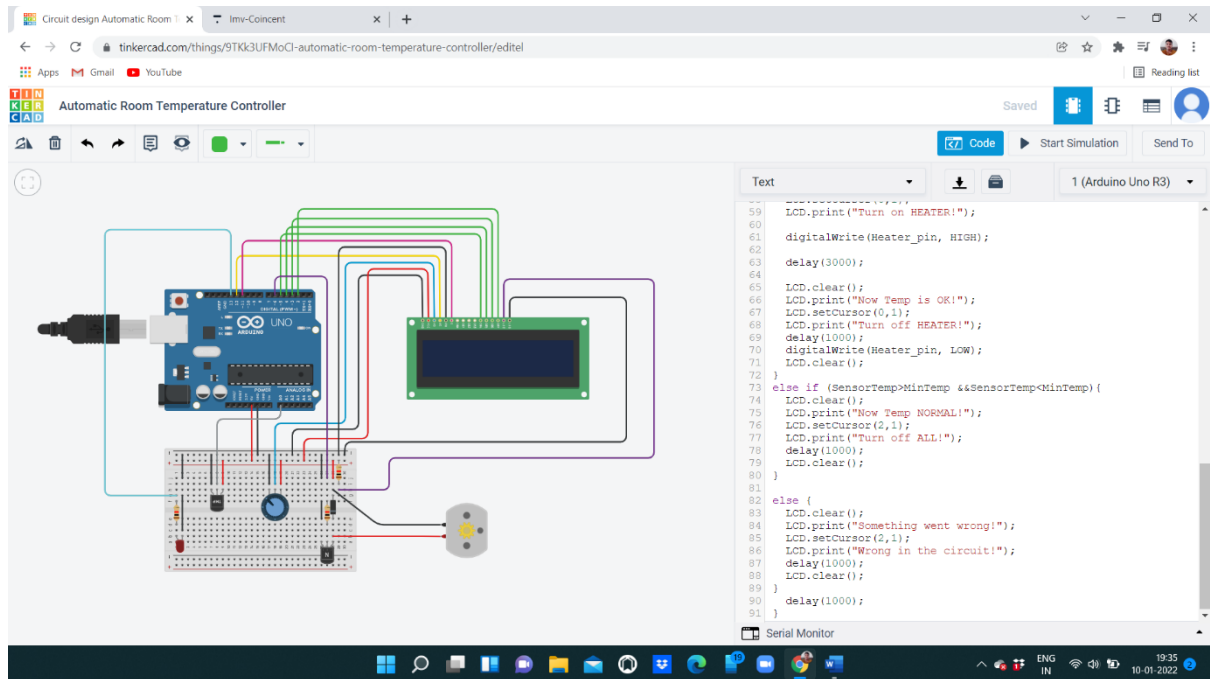
First we declare all the input and output pins in Arduino which we used. Next we fix the room temperature to a certain range (in this the fixed temperature range is 20-25 degree centigrade).



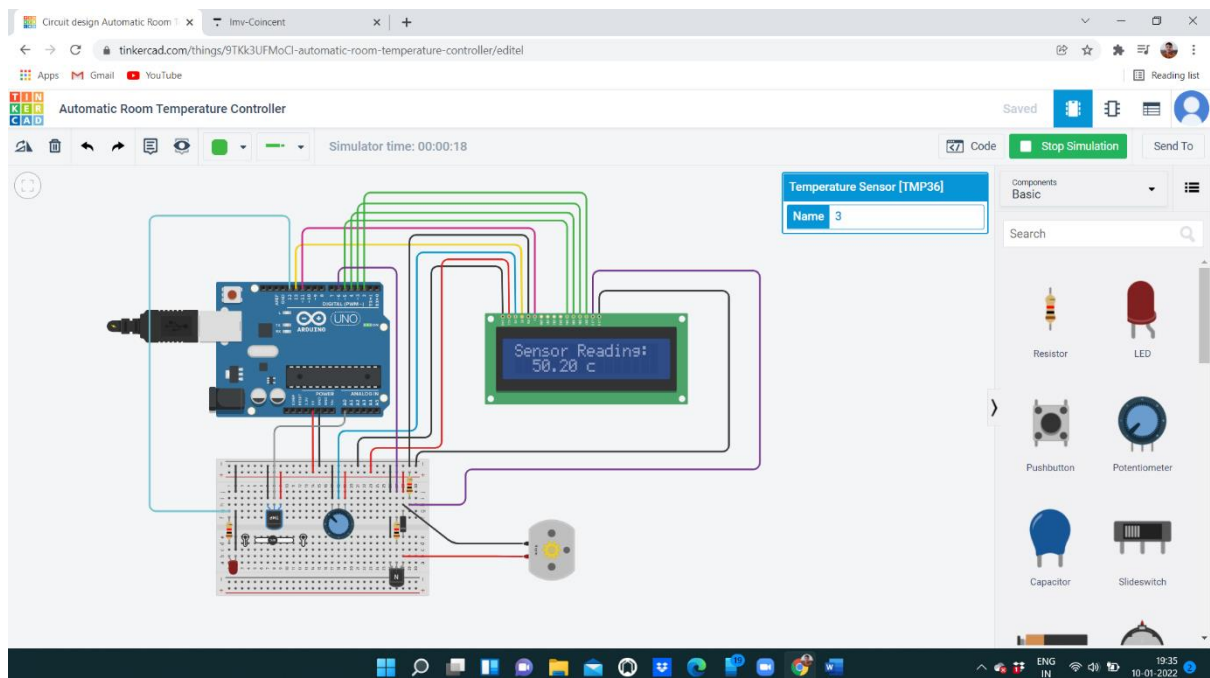
If the sensor temperature is greater than max temperature then we turn on the fan to reduce temperature. After cooling we turn off the fan.

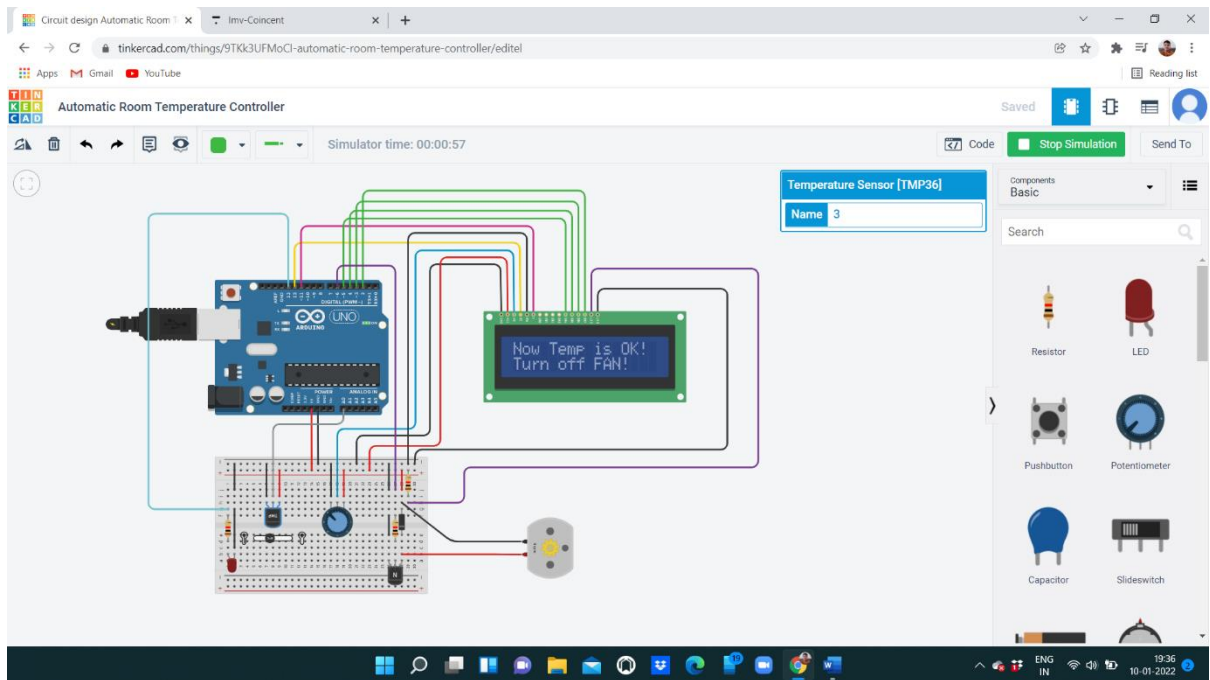
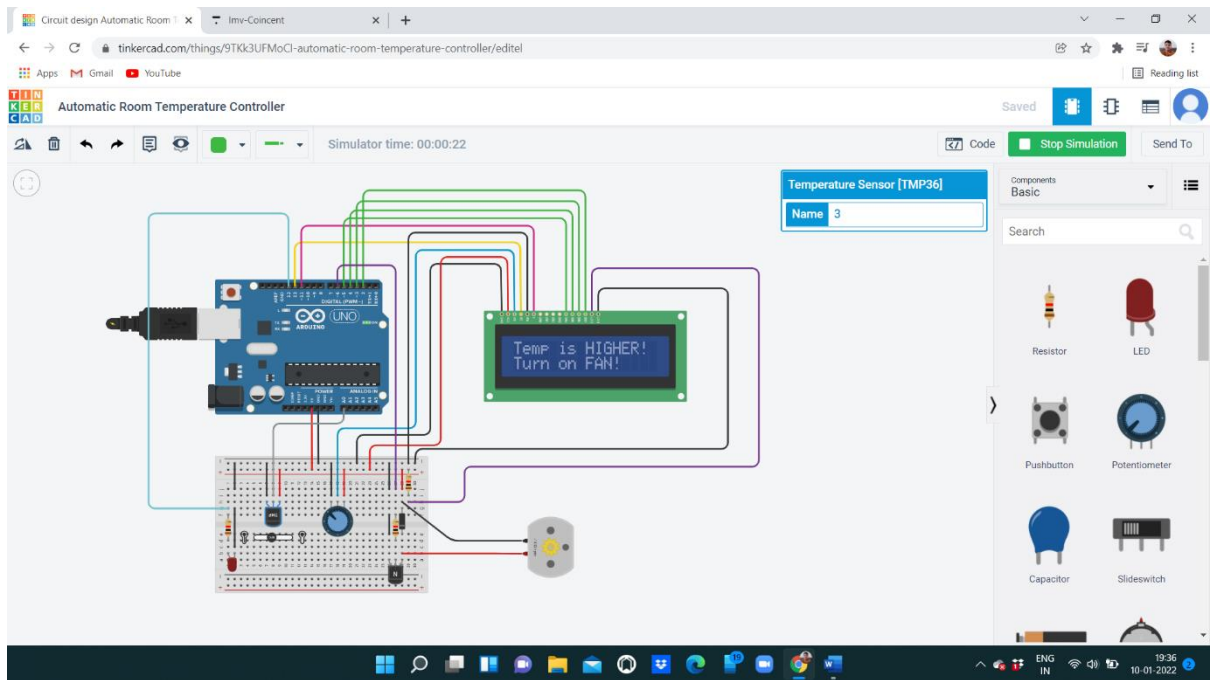


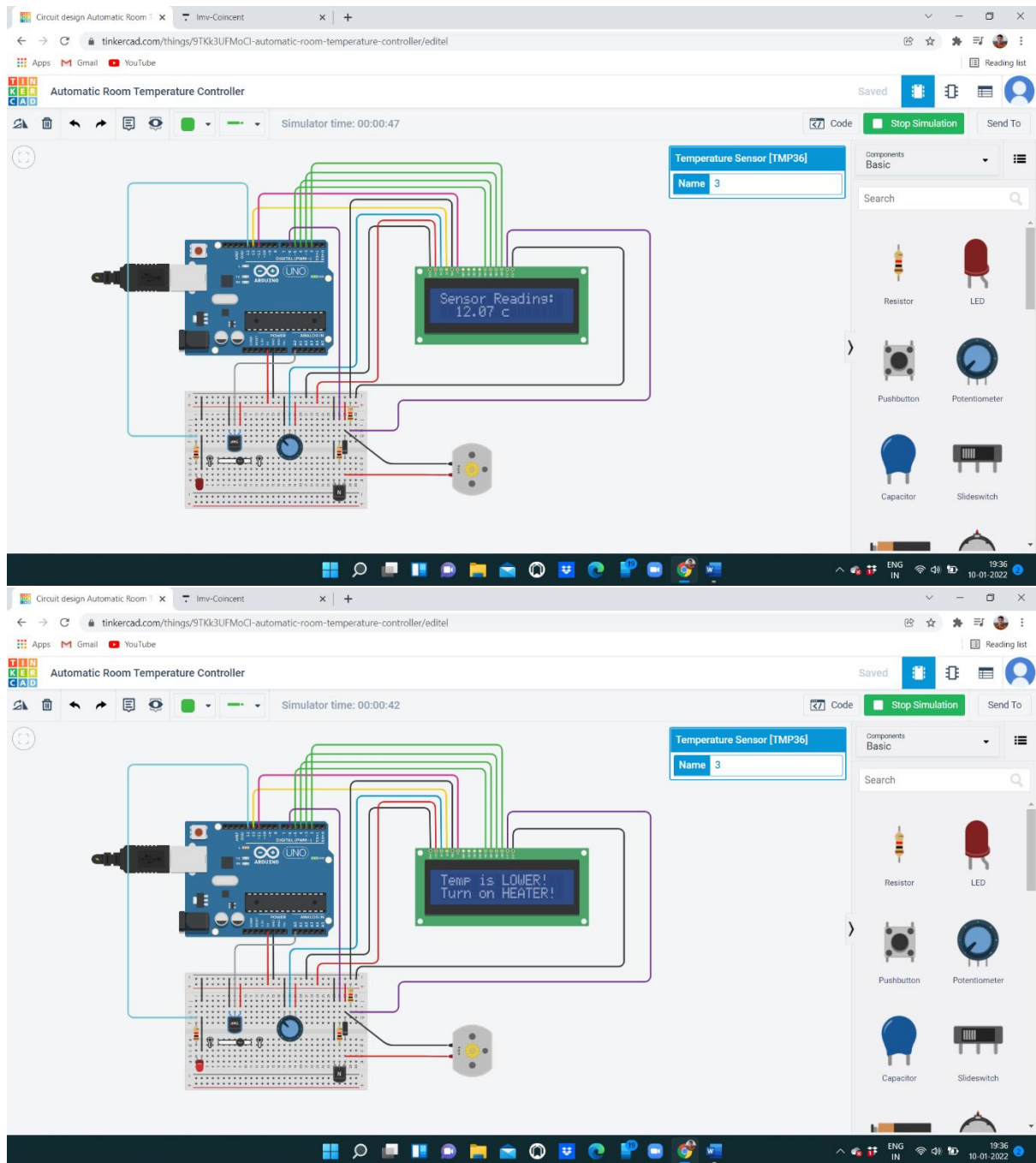
If the sensor temperature is less than min temperature we turn on the heater.
After the temperature is increased to certain temperature we turn off the heater.

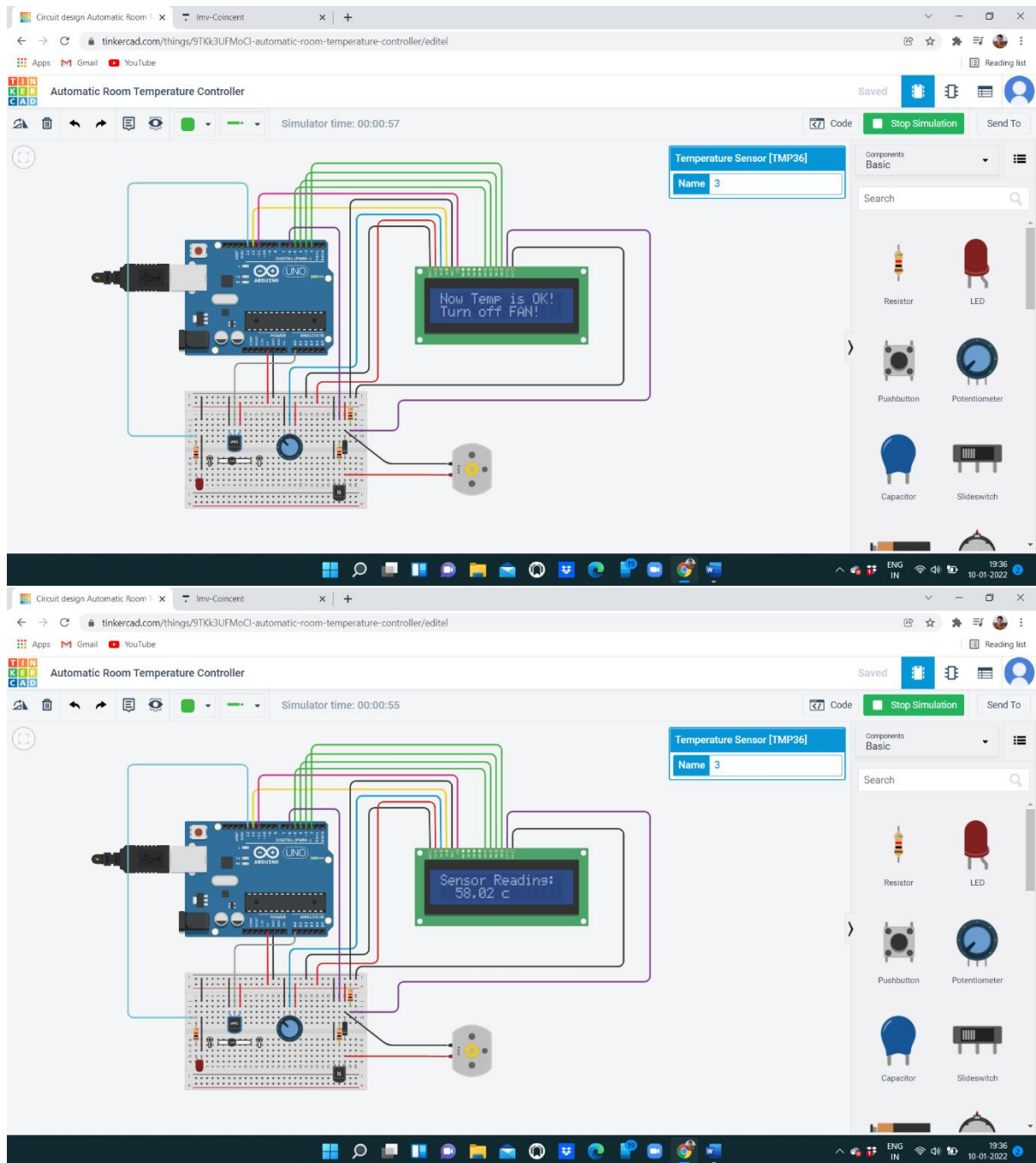


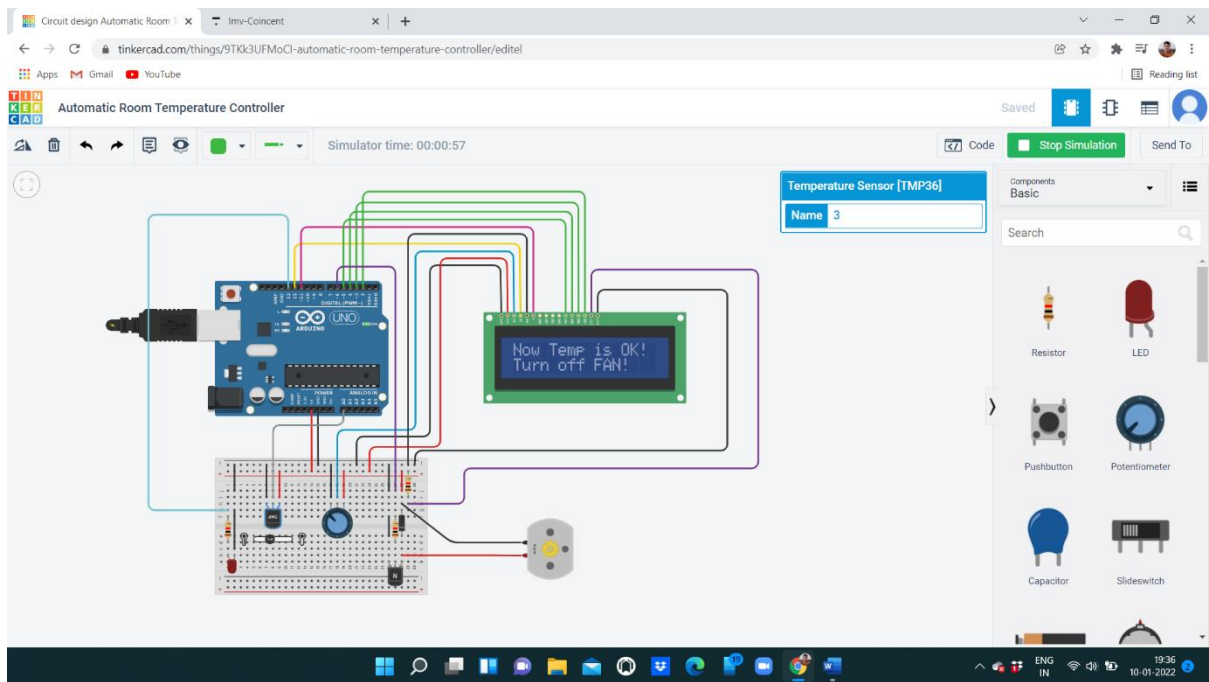
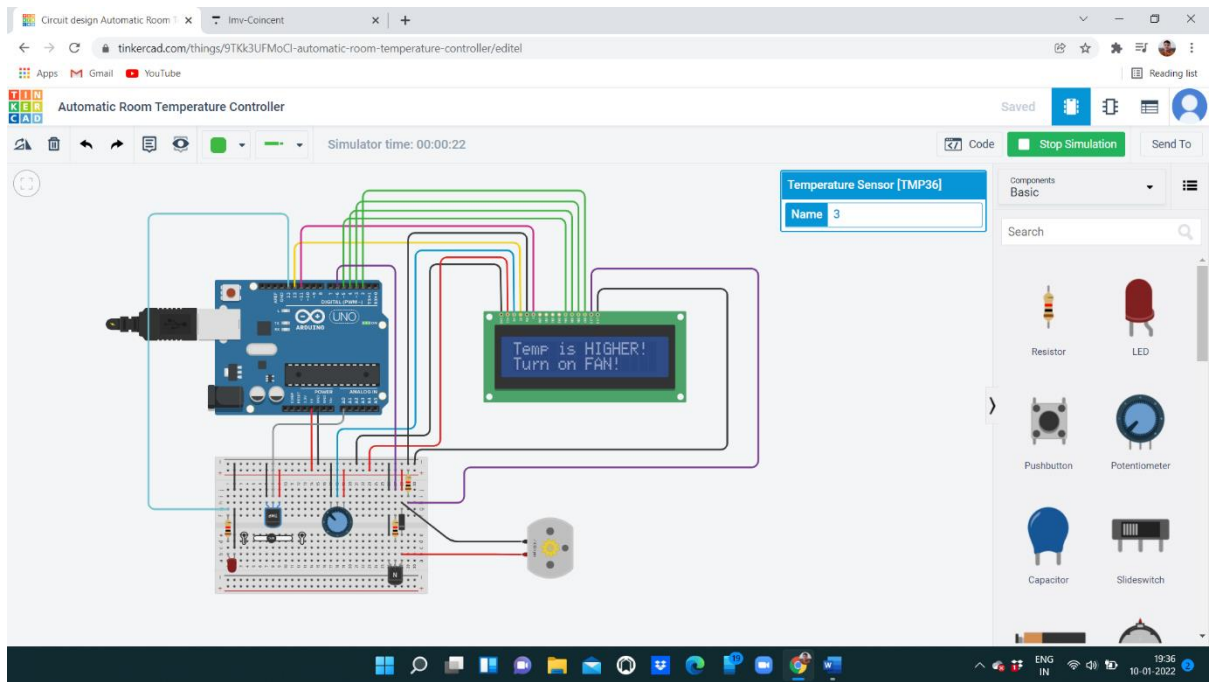
If the temperature is in the range of the fixed temperature then we see the temperature is normal on the LCD screen.

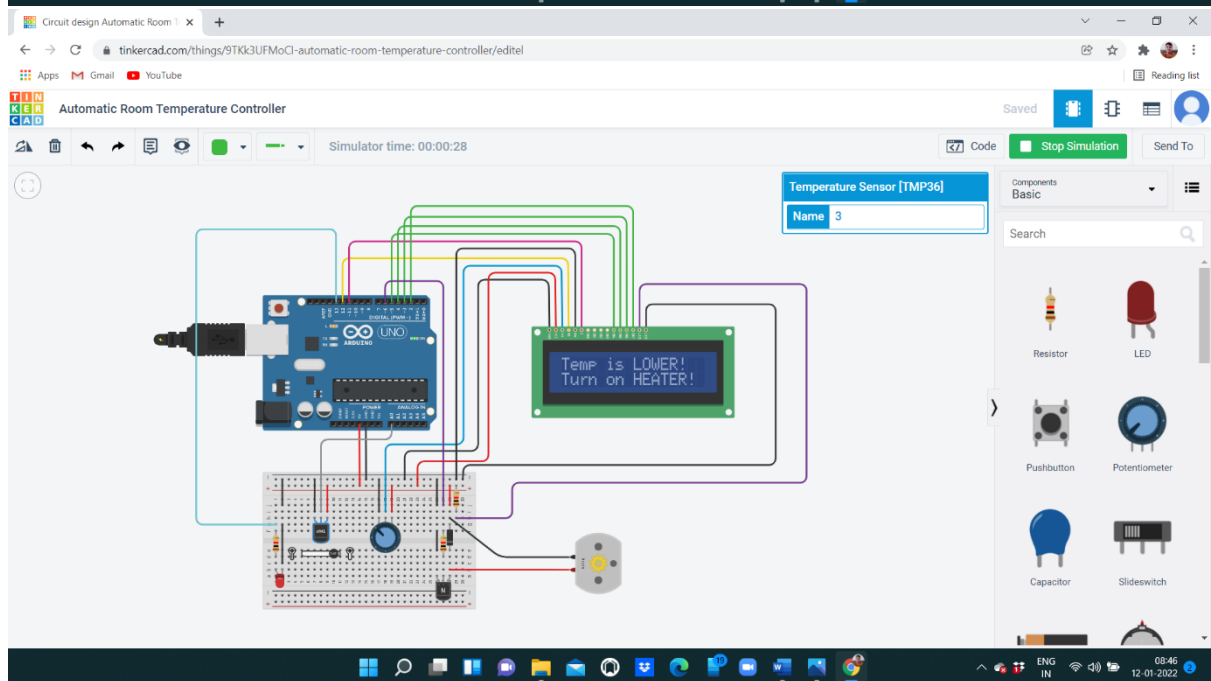
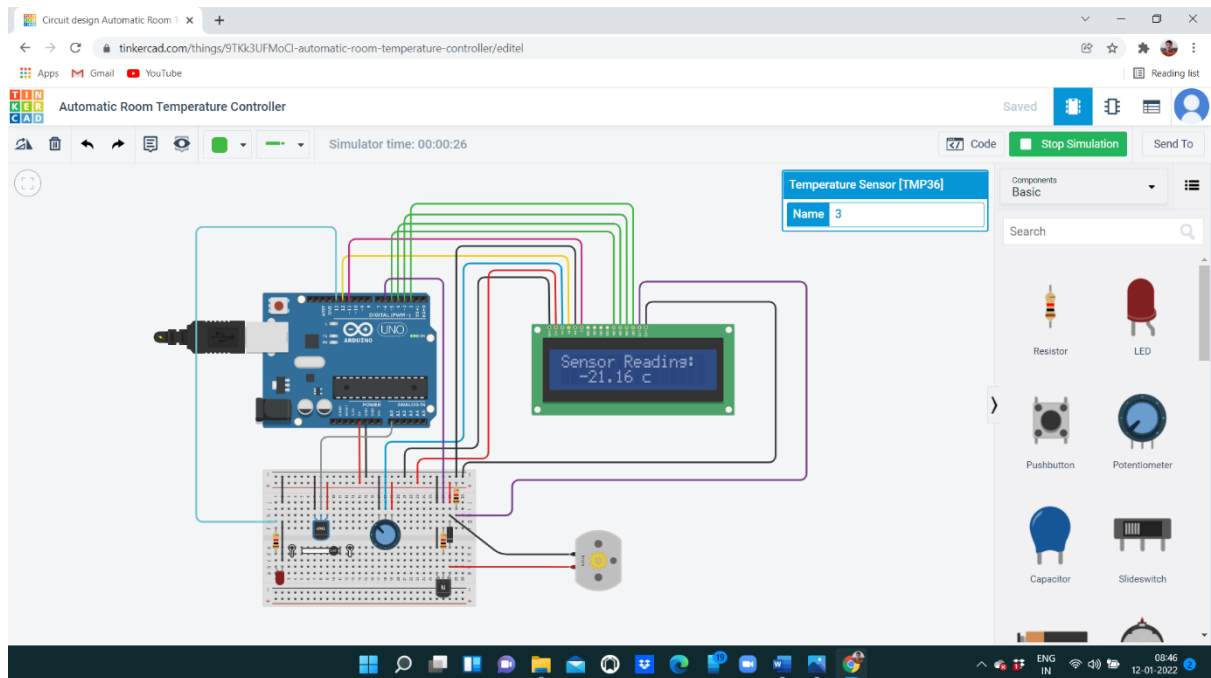


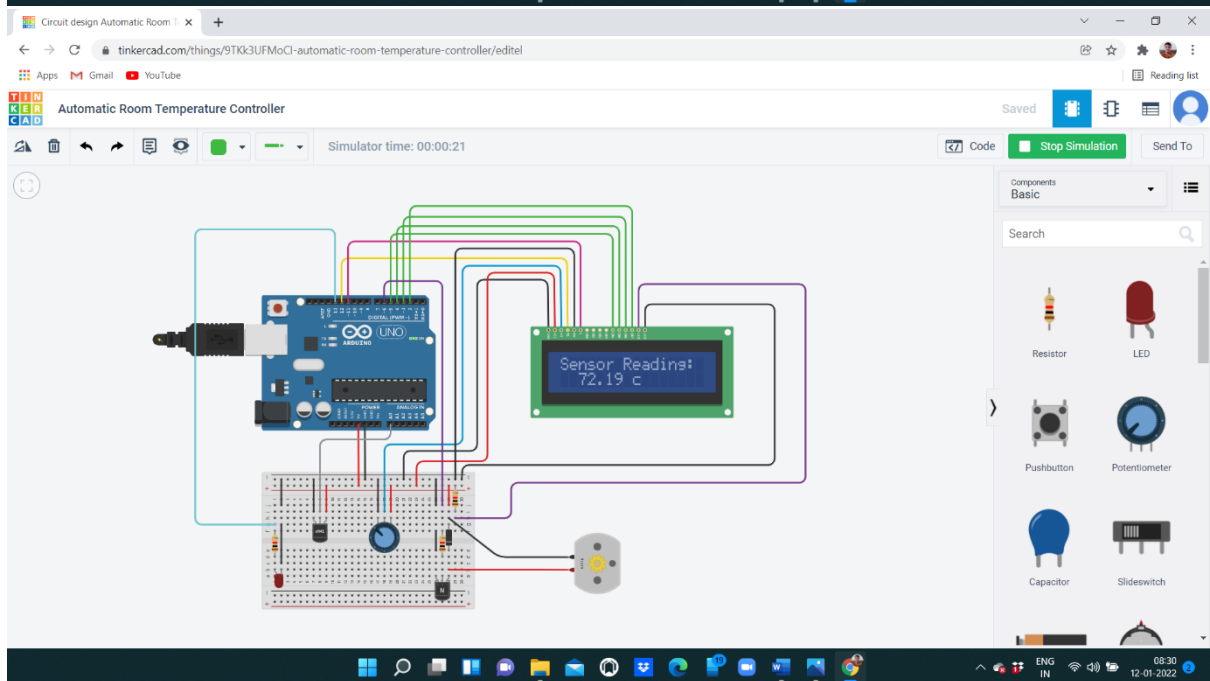
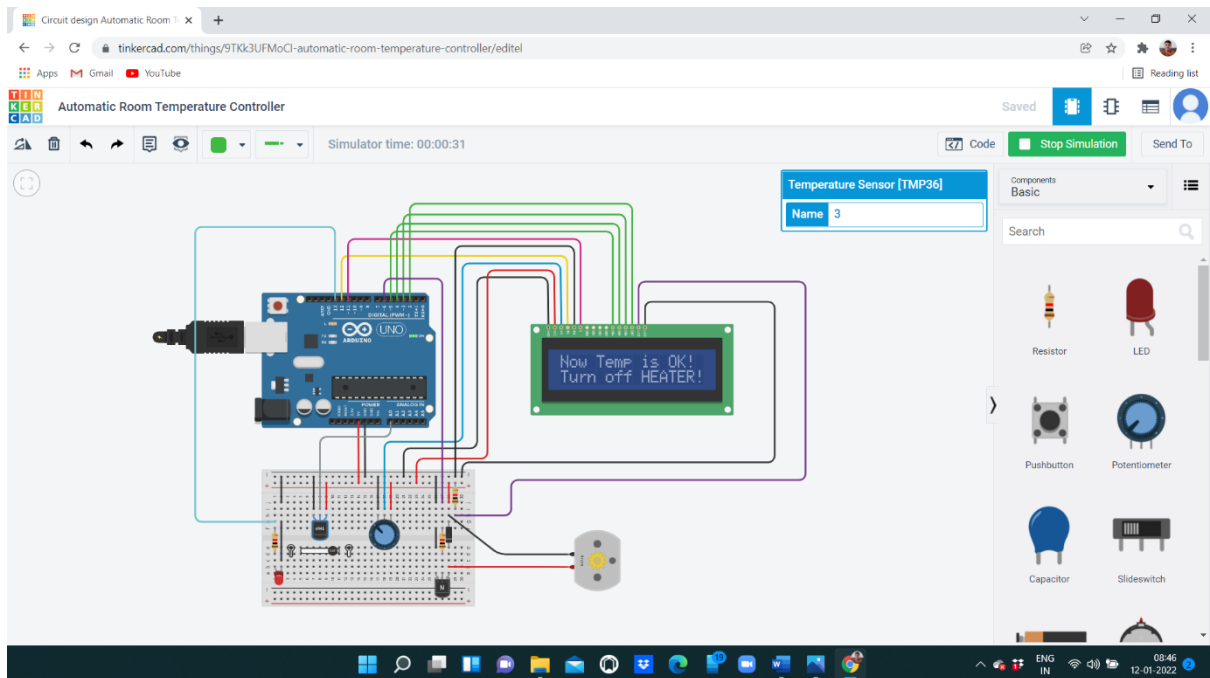


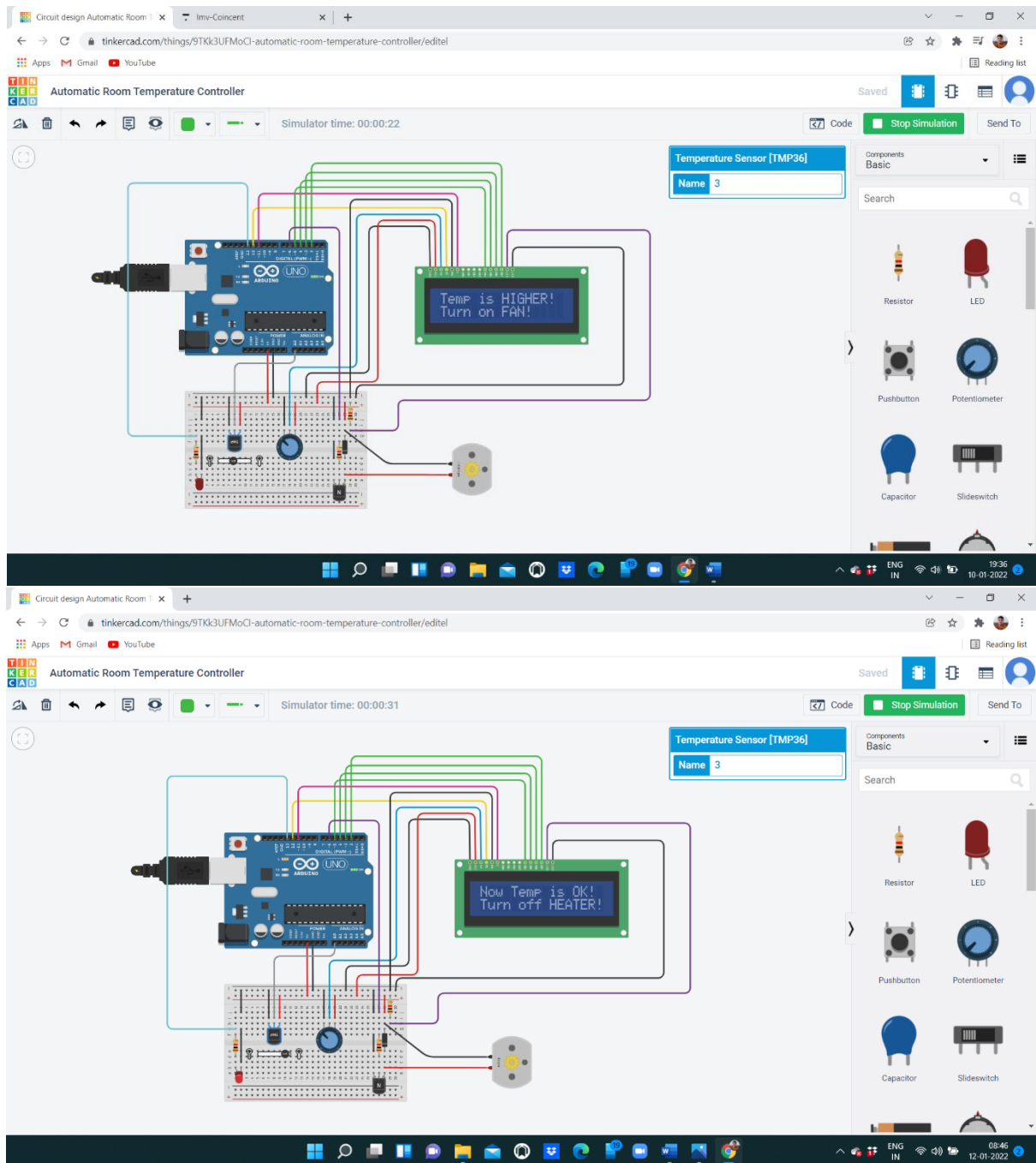












CONCLUSION:

This is very useful to all. This project is very useful to all the people because in winter season the temperatures will fall drastically to a very low temperatures at that we need to turn on the heater and in summer seasons the temperatures increases drastically so we need to turn on cooler to reduce the temperature and to maintain the temperature to a constant. By this project we can automatically maintain the temperature of a room in a certain range.

The link of the project is given below:

<https://www.tinkercad.com/things/9TKk3UFMoCI-automatic-room-temperature-controller/editel?sharecode=t-wuXWuI4oh2BPvQK84CQUV6rZqN9IvpDIvQyrwBpOg>