



**END SEMESTER ASSESSMENT (ESA)  
B.TECH. (CSE)  
IV SEMESTER**

**UE18CS256 – MICROPROCESSOR AND COMPUTER  
ARCHITECTURE LABORATORY**

**MINI PROJECT REPORT  
ON**

# **TEMPERATURE DETECTION AND MONITORING SYSTEM**

**SUBMITTED BY**

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**PES1UG19CS057  
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| TABLE OF CONTENTS |                           |         |
|-------------------|---------------------------|---------|
| Sl.No             | TOPIC                     | PAGE No |
| 1.                | ABSTRACT OF THE PROJECT   | 2       |
| 2.                | CIRCUIT DIAGRAM           | 3       |
| 3.                | ARDUINO CODE              | 4       |
| 4.                | SCREENSHOTS OF THE OUTPUT | 5       |
| 5.                | REFERENCES                | 8       |

## **ABSTRACT OF THE PROJECT:**

The main aim of this project is to create a real time temperature detection and display system which can be handy to check weather conditions in surrounding areas. The temperature sensor has a large range(-40 °C to 125 °C) and is thus suitable for all weather conditions. The sensor is used to detect the temperature and it is paired with an LCD to dynamically display the temperature.

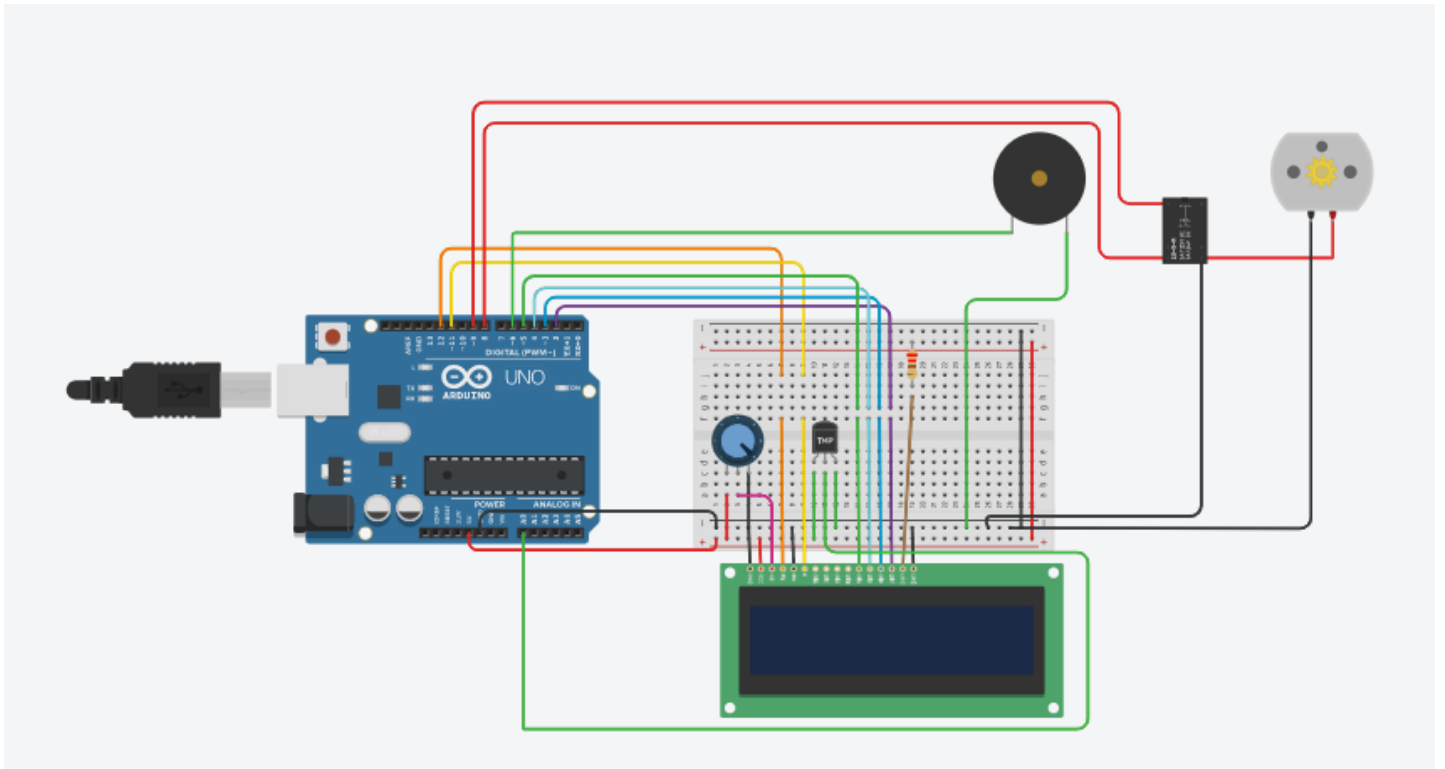
A temperature sensor works on the principle of converting the electrical signal produced to a temperature value. The sensor is made up of two metals which generate electric voltage when change in temperature is detected. The output voltage can be converted to temperature easily using the scale factor of 10 mV/°C.

Our project comprises of three deliverables:

- A temperature detection sensor which displays the current temperature on LCD
- a buzzer system which increases in frequency with increase in temperature.
- a fan(dc motor) whose speed increases with increase in temperature.

The project has been tinkered and simulated in Tinkercad.

## CIRCUIT DIAGRAM:



### Components

1. Breadboard
2. LCD display
3. Arduino UNO R3
4. TMP36 Temperature Sensor
5. Piezo Buzzer
6. Relay SPDT
7. Resistors ( as required )
8. Potentiometer

## ARDUINO CODE:

```
#include <LiquidCrystal.h>
int t=0;
int c=0;
// initialize the library with the numbers of the interface pins
LiquidCrystal lcd(12, 11, 5, 4, 3, 2);

void setup() {
  pinMode(A0, INPUT);
  pinMode(6, OUTPUT);

  Serial.begin(9600);

  // set up the LCD's number of columns and rows:
  lcd.begin(16, 2);
}

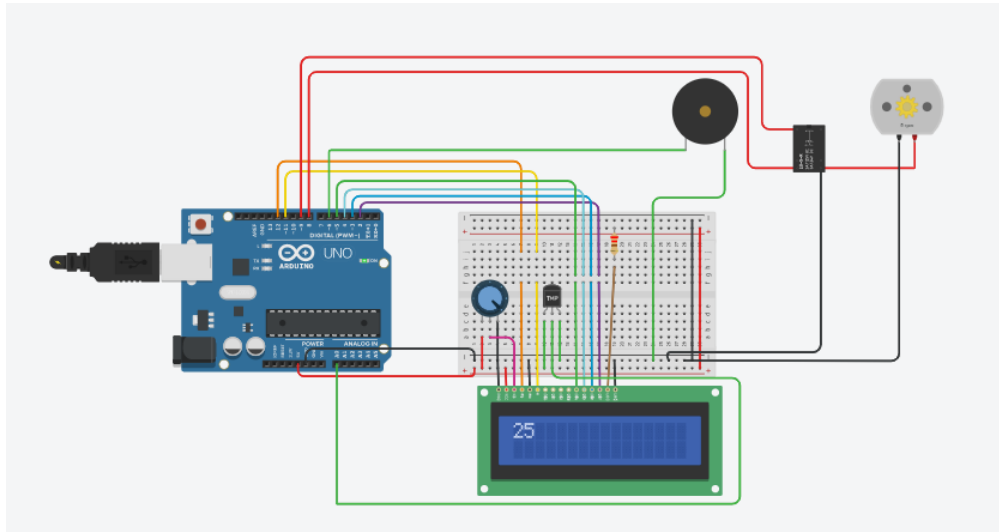
void loop() {
  // set the cursor to column 0, line 1
  // (note: line 1 is the second row, since counting begins with 0):
  t=40;
  c=map(((analogRead(A0) - 20) * 3.04), 0, 1023, -40, 125);
  lcd.setCursor(0, 0);
  // print the number of seconds since reset:
  lcd.print(c);

  if(c>50)
    digitalWrite(6, HIGH);
  else
    digitalWrite(6, LOW);
  delay(1000);
  lcd.clear();

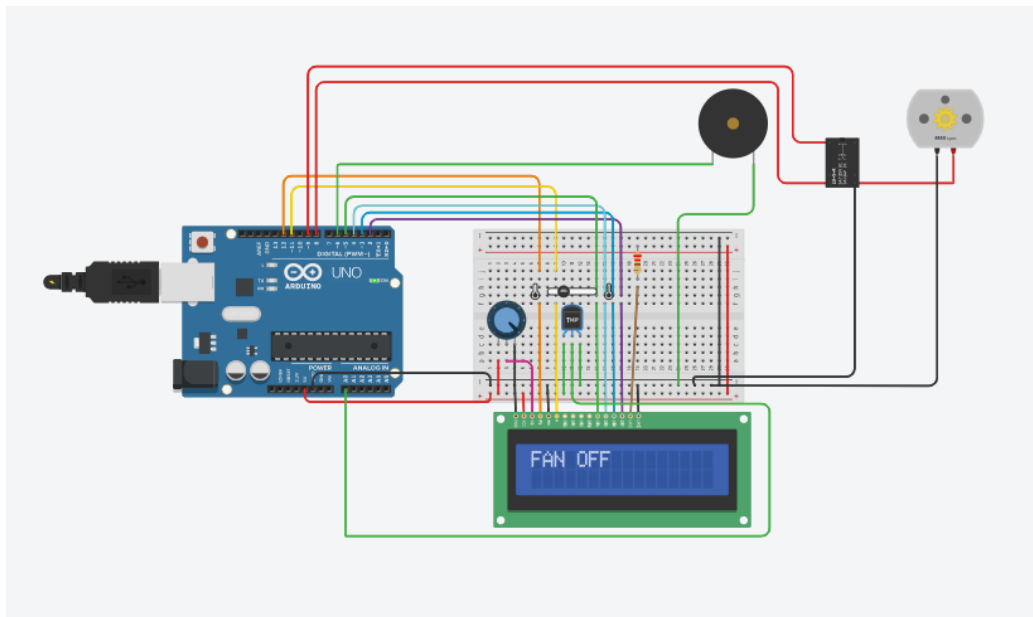
  if(c>20)
  {
    if(c>=40)
    {
      analogWrite(9, 255);
      lcd.print("Fan speed:100%");
      delay(1000);
      lcd.clear();
    }
  }
  else
    lcd.print("FAN OFF");

  delay(1000);
  lcd.clear();
}
```

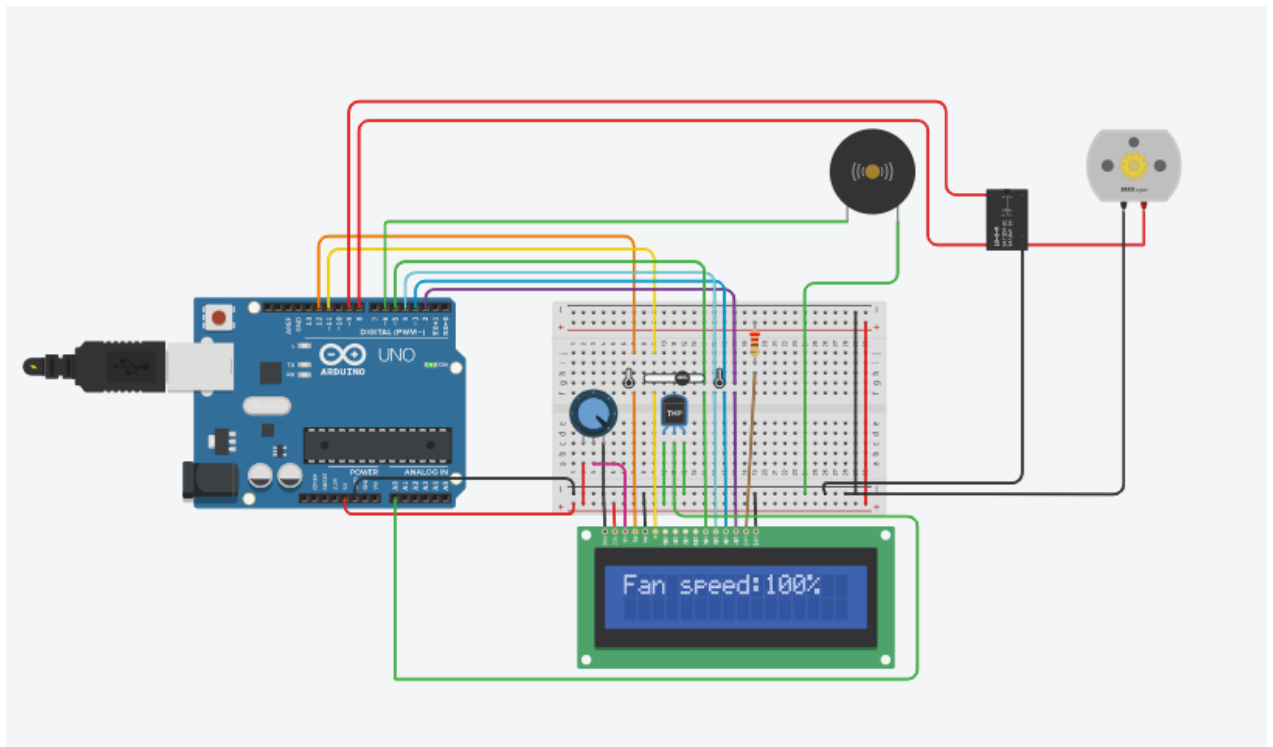
## SCREENSHOTS OF THE OUTPUT:



In the above image, the temperature sensor detects a temperature of 25 degrees( <50 ) and shows the fan as switched off as shown below. The buzzer too is not ringing indicating low temperature.



In the above image the temperature sensor detects a temperature less than 50 degrees and shows that the fan is switched off. The buzzer is off too.



In the above image the temperature sensor detects the temperature above 50 degrees. Hence we can see that the fan is switched on at 100% speed and the buzzer is also ringing.

## REFERENCES

About TMP36 temperature sensor

<https://learn.adafruit.com/tmp36-temperature-sensor>

Implementation of DC motor

<https://www.tinkercad.com/things/lIEFwFIEoMs-arduino-dc-motor>

About Relay SPDT

<https://www.electroschematics.com/spdt-relay-switch>