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Course: CSE323.6

Project : Digital Thermometer

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Project Title: Digital Thermometer

Introduction:

Digital thermometer is an instrument to measure temperature. Analogue thermometer or clinical thermometers are also used for measuring the temperature of body. But this thermometer is sometimes dangerous as there is a possibility of breaking the glass and the mercury will evaporate and cause harm. But on the other hand, digital thermometer is safe to use, by touching the sensor we can get the temperature reading.

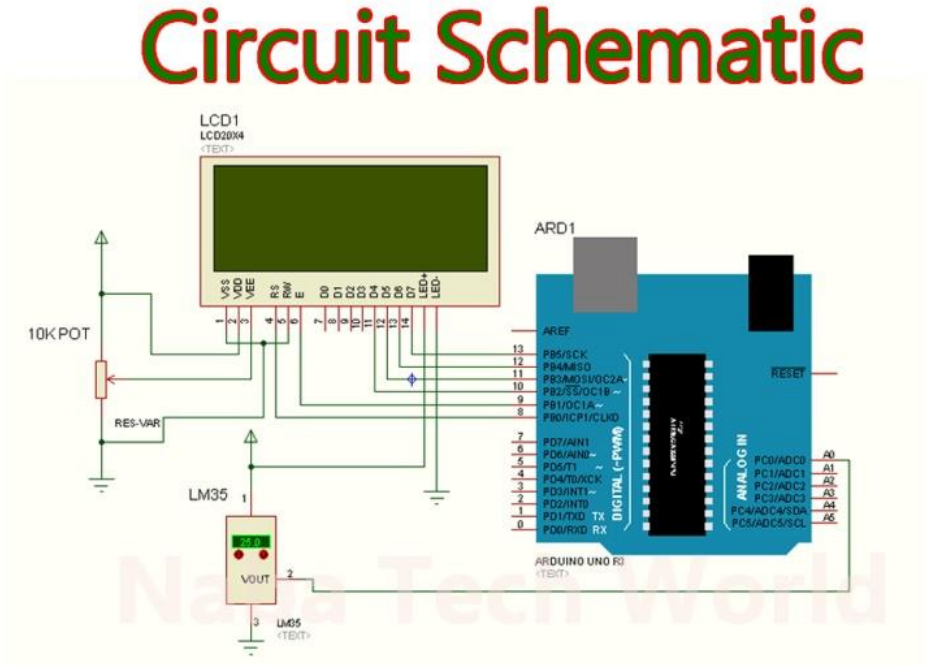
Objective:

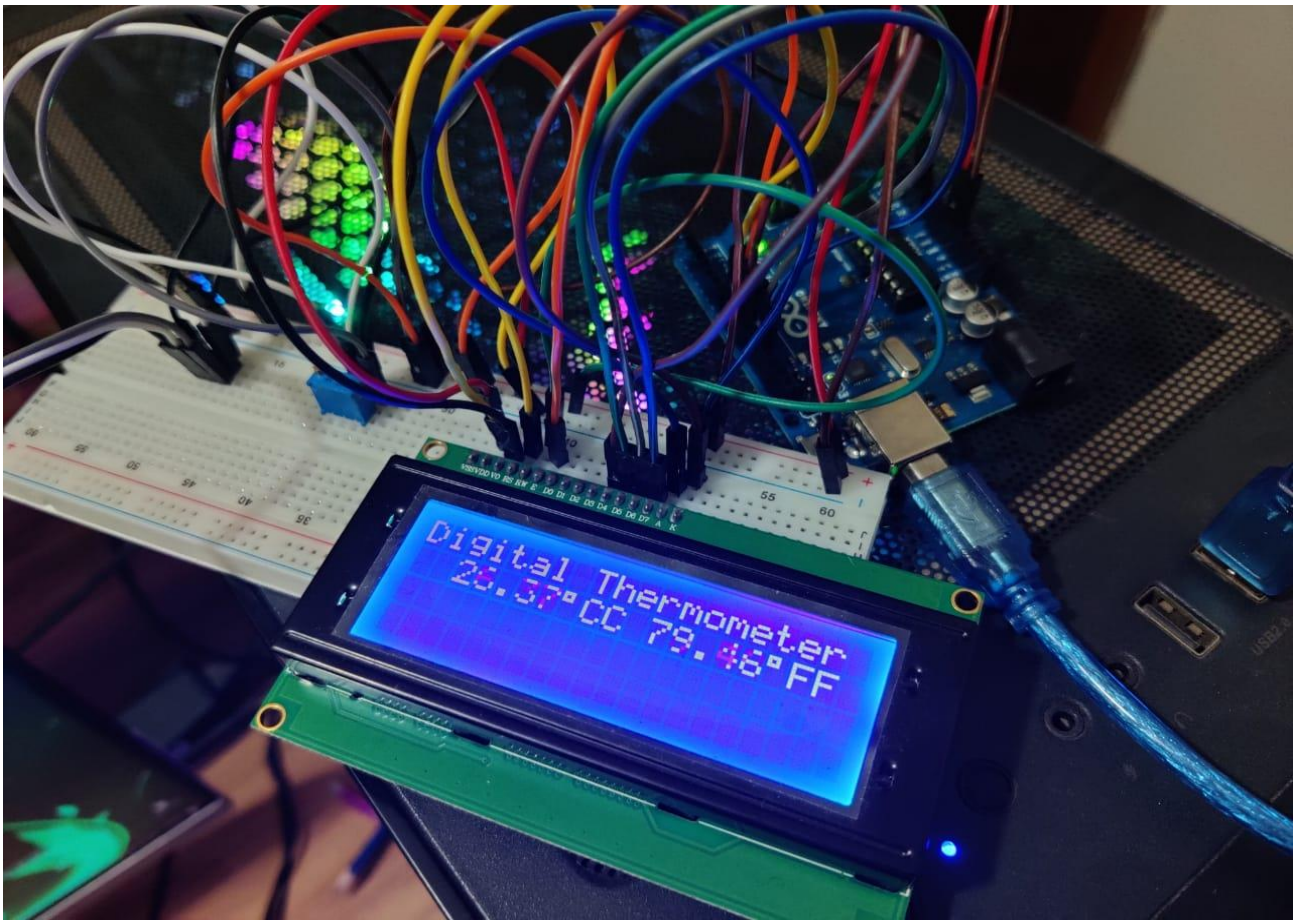
i. To measure the temperature.
ii. It will show the reading both in Celsius and Fahrenheit.
iii. Body temperature can be measured just by touching the sensor.
iv. Arduino based, this digital thermometer can be used to monitor the temperature of the room.

Required Apparatus:

1. Temperature Sensor(LM35)
2. Arduino Uno R3
3. Potentiometer(10k Ohm)
4. LCD Display (20x4)
5. Male to Female Jumper wires
6. Male to Male Jumper Wires

Working Diagram:





Our Project : Digital Thermometer showing realtime temperature of the room.

Code:

digital_thermometer.ino

C: > Users > User > Desktop > Arduino LM35 Digital Thermometer > digital_thermometer > digital_thermometer.ino

```
float cel,far;
void setup()
{
 lcd.begin(20,4);
}
void loop()
{
 value = analogRead(A0);
 cel = (value * 0.48828);
 far = (1.8 * cel) + 32;
 lcd.setCursor(0,0);
 lcd.print("Digital Thermometer");
 lcd.setCursor(2,1);
 lcd.print(cel);
 lcd.print(char(223));
 lcd.print("C");
 lcd.setCursor(11,1);
 lcd.print(far);
 lcd.print(char(223));
 lcd.print("F");
 delay(1000);
}
```

Discussion:

1. First of all we have connected the temperature sensor to the power source (5v), ground connection and the sensor input to A0 pin.
2. We took the reading from the sensor and converted into Celsius in our code.
3. From the Celsius we converted to Fahrenheit and checked the output in the console.
4. To show the output we have connected the LCD display. We have connected the potentiometer to adjust the visibility of the LCD display.
5. Then we wrote the code to print the temperature to the display.
6. We uploaded the code in Arduino.
7. Lastly, we can see the temperature printed on the display which is frequently updating by taking the temperature reading from the sensor.

Reference:

https://howtomechatronics.com/tutorials/arduino/lcd-tutorial/

https://www.electronicsforu.com/technology-trends/learn-electronics/how-to-upload-source-code-on-arduino-board

https://lastminuteengineers.com/lm35-temperature-sensor-arduino-tutorial/

https://www.youtube.com/watch?v=hdEgMBVaxrM

The End