ASSIGNMENT NO: 9

Title:

Write a program so it displays the temperature in Fahrenheit as well as the maximum and minimum temperatures it has seen.

Aim:

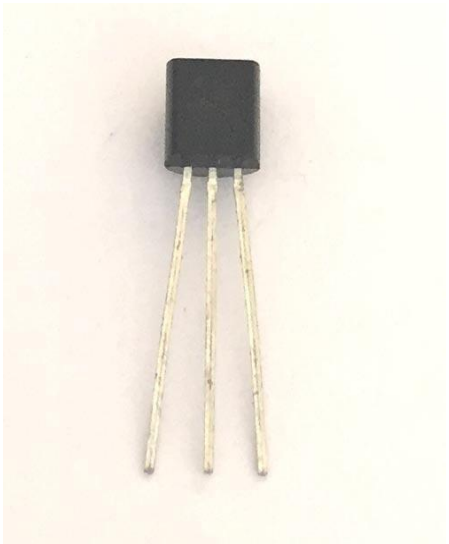
Understand working principle of DHT11, LM35 temperature sensor.

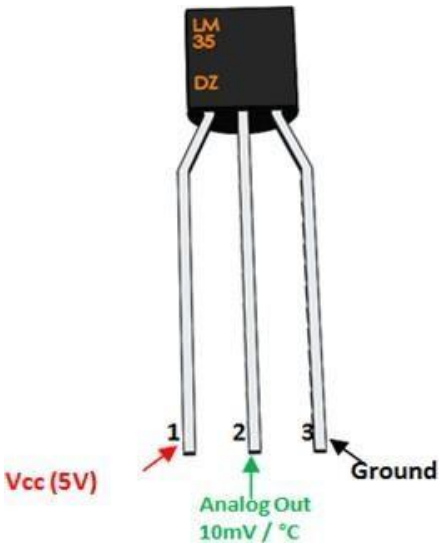
Objectives:.

- Temperature Conversion: Convert the temperature readings from Celsius to Fahrenheit for display.
- Track Maximum and Minimum Temperatures: Keep track of the maximum and minimum temperatures observed.
- Serial Monitor Display: Continuously display the current temperature in Fahrenheit, along with the maximum and minimum values, on the Serial Monitor.
- Delay: Introduce a short delay between readings to make the output more readable and avoid rapid updates

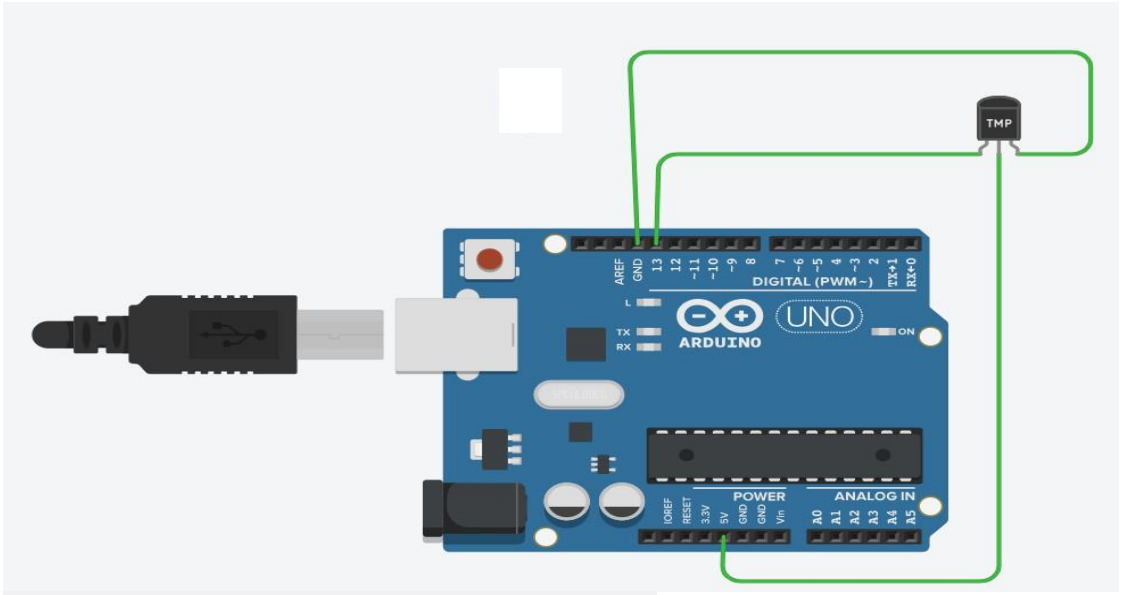
Hardware Requirement*:* Arduino, LED, LM35, DHT11 etc.

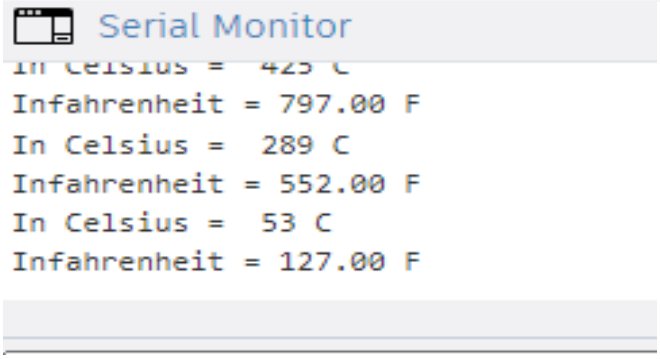
Software Requirement: Arduino IDE





This program provides a practical solution for monitoring temperature using an Arduino and a BME280 sensor. It not only displays real-time temperature in Fahrenheit but also keeps track of the highest and lowest temperatures encountered, enhancing its utility for various applications requiring temperature monitoring





To install the DHT11 library for Arduino, follow these steps:

1. To execute this code in the Arduino IDE, you need to first install the DHT library in your Arduino directory
2. Download the zip file from this location and move it into your Arduino library folder.
3. The path to the Arduino library folder on my computer path :

Documents/Arduino/Libraries

4. Extract the downloaded file and move its contents to the specified folder
5. After copying the files, ensure that the Arduino library folder contains a new folder named "DHT" with the files "dht.h" and "dht.cpp." Next, copy the following code into the Arduino IDE and upload it

Temperature Scales

Thermometers help measure temperature, and there are three common scales: Celsius & Fahrenheit and Kelvin.

Celsius Scale & Fahrenheit Scale:

Celsius uses 0ºC for water freezing and 100ºC for boiling. Fahrenheit uses 32ºF for water freezing and 212ºF for boiling. One degree Celsius is 1.8 times larger than one degree Fahrenheit.

Kelvin Scale:

Kelvin is widely used in science, starting at 0 K (absolute zero). Water freezes at 273.15 K and boils at 373.15 K. Kelvin is an absolute scale with no negative temperatures, representing the lowest theoretically achievable temperature

Relationship between Different Temperature Scales

Conversion	Equation
Celsius to Fahrenheit	$T_{F^o} = \frac{9}{5}T_{c^o} + 32$
Fahrenheit to Celsius	$T_{C^o} = \frac{5}{9}T_{F^o} - 32$
Celsius to Kelvin	$T_K = T_{C^o} + 273.15$
Kelvin to Celsius	$T_{C^o} = T_K - 273.15$
Fahrenheit to Kelvin	$T_K = \frac{5}{9}(T(F^0) - 32) + 273.15$
Kelvin to Fahrenheit	$T_{F^0} = \frac{9}{5}(T(K) - 273.15) + 32$

Conclusion: Thus we conclude the temperature in Fahrenheit as well as the maximum and minimum temperatures it has seen.