Hope Foundation's
Finolex Academy of Management & Technology, Ratnagiri
Department of MCA
MCALE232 Internet of Things Lab

Practical 11

Aim: - To interface **Temperature Sensor** with Arduino.

Components Required :

Arduino Board, Bread Board, Temperature Sensor, Resistors, Connecting wires,

Theory:

The temperature sensor in Arduino converts the surrounding temperature to voltage. It further converts the voltage to Celsius, Celsius to Fahrenheit, and prints the Celsius or Fahrenheit temperature on the serial monitor.

We will use a temperature sensor (TMP 36) of low voltage. Such sensors are also stable while dealing with large capacitive loads. It is also suitable for automotive applications.

The temperature sensors TMP 35, TMP 36, and TMP 37 are the sensors with the same features.

The operating voltage of the TMP 36 sensor ranges from 2.7V to 5.5V.

It has three terminals, which are listed below:

- **Pin 1: DC voltage**

Here, we will connect the DC voltage pin to 5V on the Arduino UNO board.

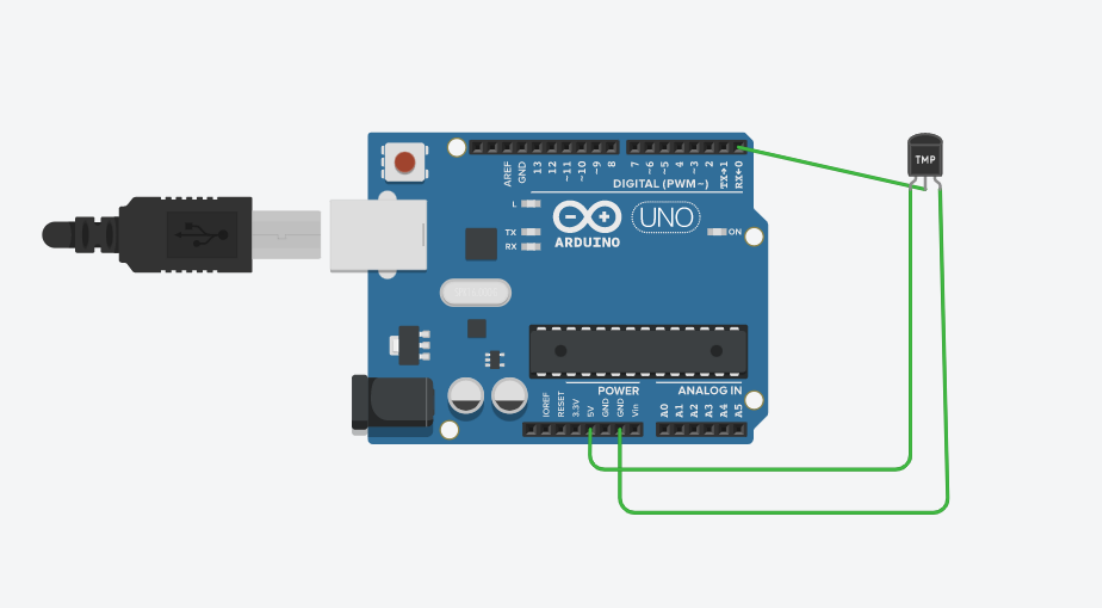
- **Pin 2: Analog voltage output**

We will consider the Analog voltage output pin as the output.

- **Pin 3: GND**

We will connect the GND pin to Ground on the Arduino UNO board

Circuit Diagram:

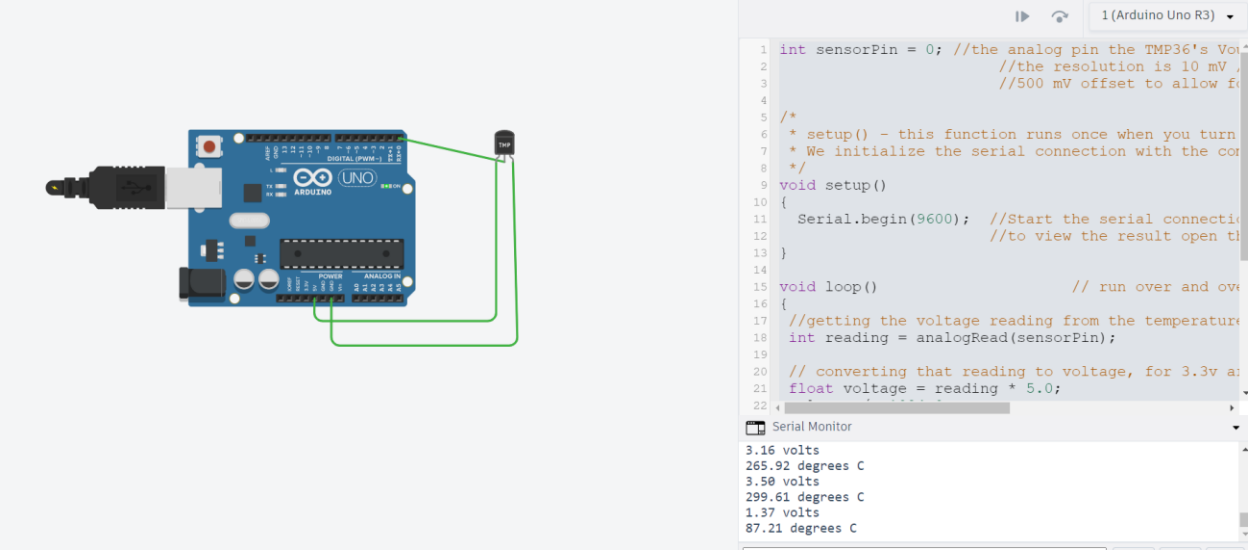


Code:

```
int sensorPin = 0; //the analog pin the TMP36's Vout (sense) pin is connected to
                   //the resolution is 10 mV / degree centigrade with a
                   //500 mV offset to allow for negative temperatures

/*
 * setup() - this function runs once when you turn your Arduino on
 * We initialize the serial connection with the computer
 */
void setup()
{
  Serial.begin(9600);  //Start the serial connection with the computer
                       //to view the result open the serial monitor
}

void loop()                     // run over and over again
{
```

```
 //getting the voltage reading from the temperature sensor
 int reading = analogRead(sensorPin);

 // converting that reading to voltage, for 3.3v arduino use 3.3
 float voltage = reading * 5.0;
 voltage /= 1024.0;

 // print out the voltage
 Serial.print(voltage); Serial.println(" volts");

 // now print out the temperature
 float temperatureC = (voltage - 0.5) * 100 ;  //converting from 10 mv per degree wit 500
mV offset
                                       //to degrees ((voltage - 500mV) times 100)
 Serial.print(temperatureC); Serial.println(" degrees C");


 delay(1000);                          //waiting a second
}
```

Output :



Conclusion: Thus we studied the interfacing of Temperature sensor with Arduino and how to convert the temperature from voltage to Celsius or Fahrenheit.