Interfacing TMP36 Temperature Sensor with Arduino

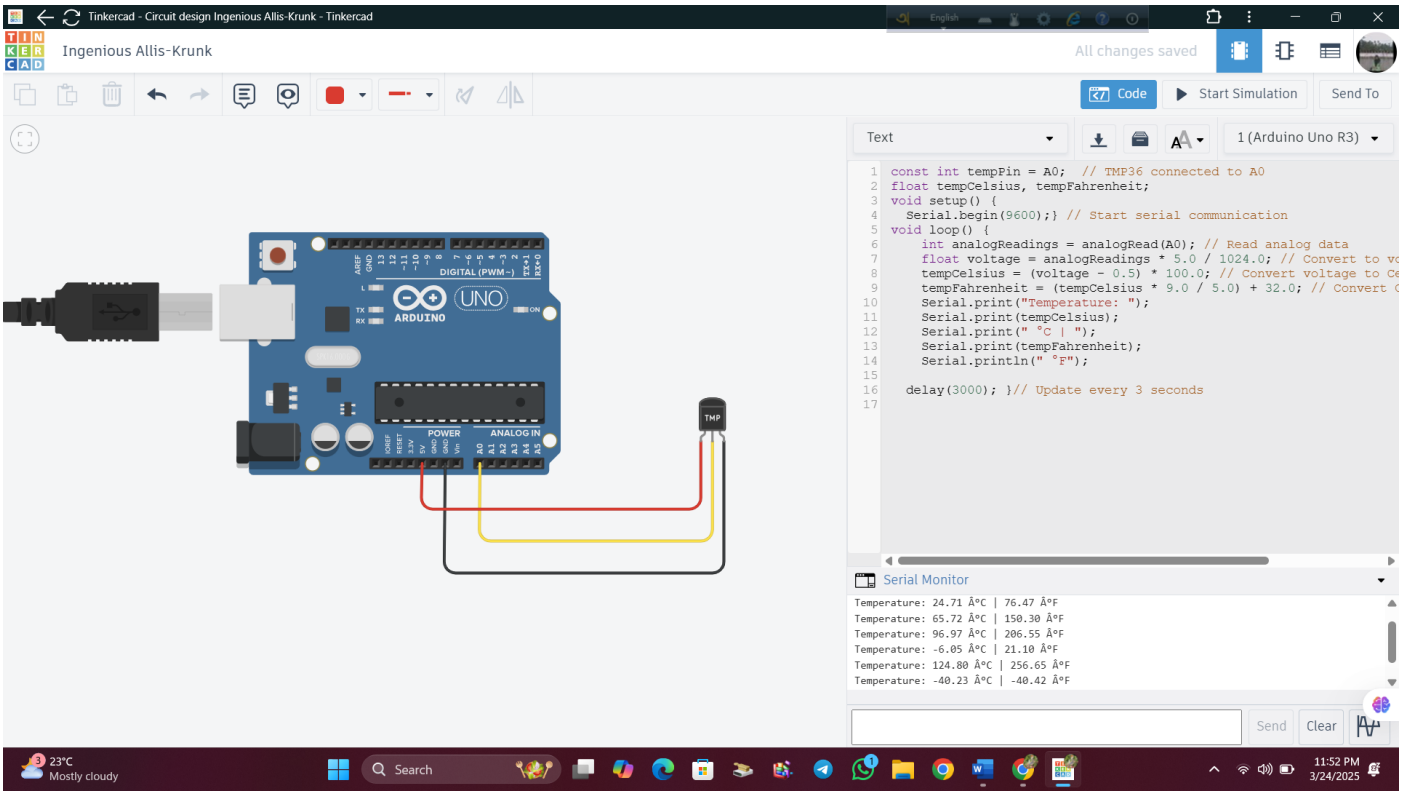
Components Required:

1. **Arduino Board**
2. **TMP36 Temperature Sensor**
3. **Connecting Wires**
4. **Breadboard (optional)**

Connections:

- **TMP36 has three pins:**
  - **VCC (Power Pin)** → Connect to **5V** on Arduino
  - **Vout (Output Pin)** → Connect to **Analog Pin A0**
  - **GND (Ground Pin)** → Connect to **GND** on Arduino

Circuit:



Working Principle:

1. The sensor measures temperature and provides an analog voltage output.
2. The Arduino reads the analog signal from **A0**.
3. The voltage is converted to temperature using a mathematical formula.
4. The temperature is displayed in **Celsius and Fahrenheit** on the **Serial Monitor**.
5. The readings update every **3 seconds**.

Arduino Code:

```
const int tempPin = A0;  // TMP36 connected to A0

float tempCelsius, tempFahrenheit;

void setup() {

   Serial.begin(9600); // Start serial communication}

void loop() {

   int analogReadings = analogRead(tempPin); // Read analog data

   float voltage = analogReadings * 5.0 / 1024.0; // Convert to voltage

   tempCelsius = (voltage - 0.5) * 100.0; // Convert voltage to Celsius

   tempFahrenheit = (tempCelsius * 9.0 / 5.0) + 32.0; // Convert Celsius to Fahrenheit

   Serial.print("Temperature: ");

   Serial.print(tempCelsius);

   Serial.print(" °C | ");

   Serial.print(tempFahrenheit);

   Serial.println(" °F");


   delay(3000); // Update every 3 seconds}
```

Observations:

- The temperature readings are displayed on the **Serial Monitor**.
- As the **temperature increases or decreases**, the readings change dynamically.

This project helps in understanding **temperature sensing, analog-to-digital conversion, and serial communication** using Arduino in **Tinkercad simulation**.