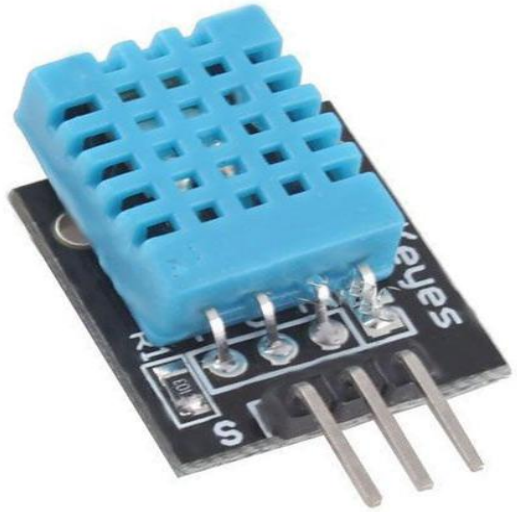
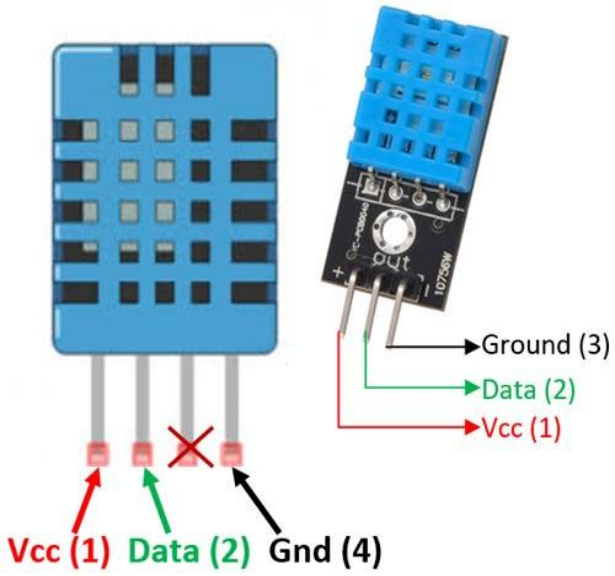
Practical -3

Objective: Make a program and execute to program for Interface of temperature sensor with ARDUINO.

Introduction: The DHT11 is a commonly used Temperature and humidity sensor that comes with a dedicated NTC to measure temperature and an 8-bit microcontroller to output the values of temperature and humidity as serial data.



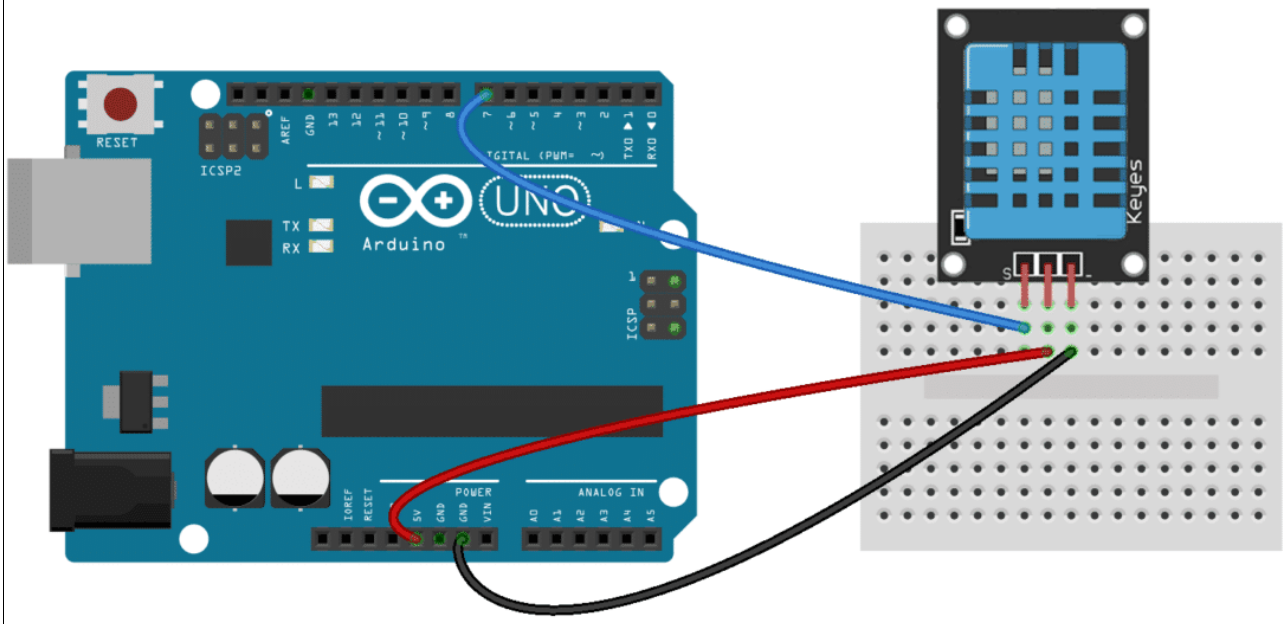
DHT11–Temperature and Humidity Sensor



DHT11 Sensor Pinout

Hardware Required:

Component Name	**Quantity**
Arduino UNO	1
DHT Sensor	1
USB Cable	1
Register	4.7k Ω
Breadboard	1
Jumper wires	several



Connection Diagram:

DHT11 Pinout Configuration:

No:	Pin Name	Description
For DHT11 Sensor		
1	Vcc	Power supply 3.5V to 5.5V
2	Data	Outputs both Temperature and Humidity through serial Data
3	NC	No Connection and hence not used
4	Ground	Connected to the ground of the circuit

For DHT11 Sensor module

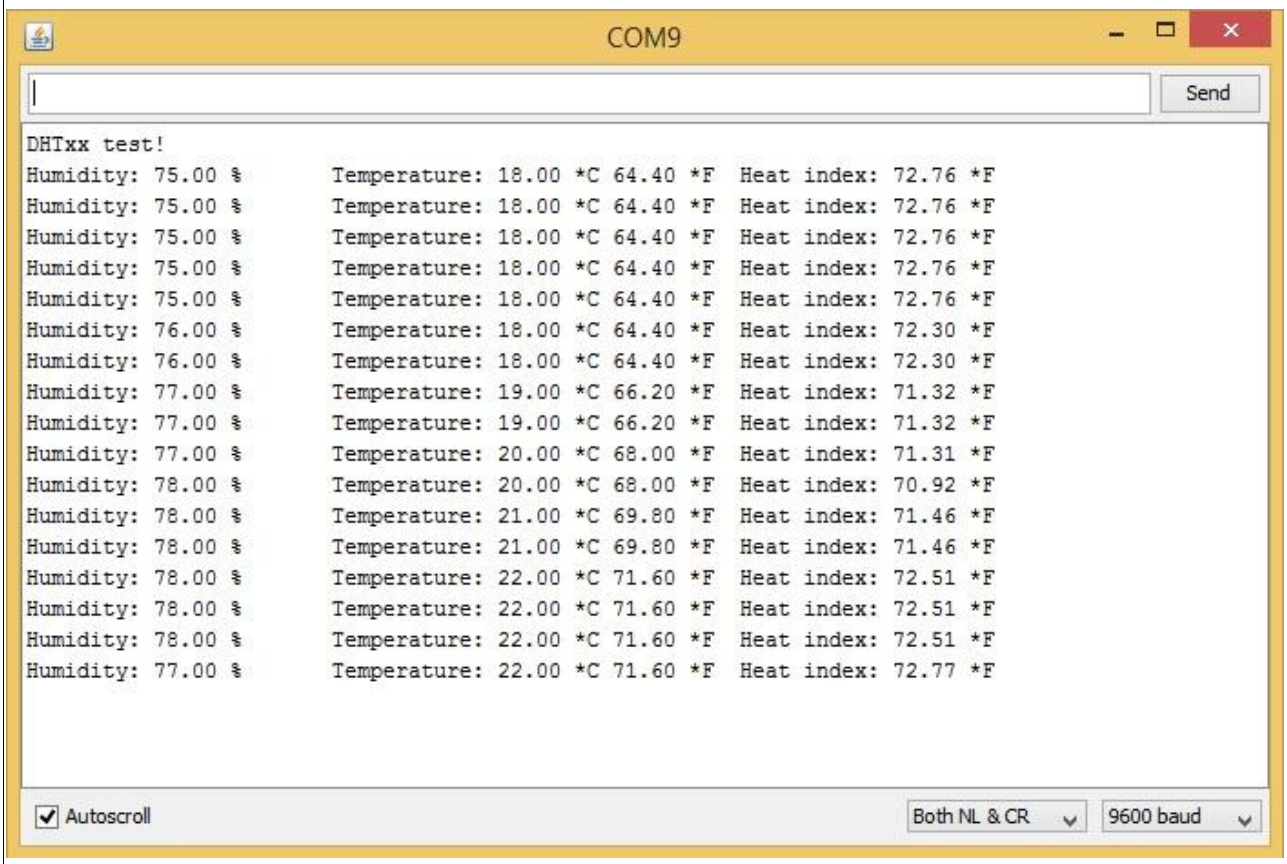
1	Vcc	Power supply 3.5V to 5.5V
2	Data	Outputs both Temperature and Humidity through serial Data
3	Ground	Connected to the ground of the circuit

Connection Program:

```
#include "DHT.h"      // This is library code

#define DHTPIN 2     // as you want to take pin number data number
#define DHTTYPE DHT11  //i want to use dht 11 sensor so i firstly define DHTTYPE DHT11 or DHT22
DHT dht(DHTPIN, DHTTYPE);

void setup() {
  Serial.begin(9600);
  Serial.println("Welcome DHT11 Sensor");
  dht.begin();
}

void loop() {

  delay(2000);
  float h = dht.readHumidity();
  float t = dht.readTemperature();
  float f = dht.readTemperature(true);

  if (isnan(h) || isnan(t) || isnan(f)) { // I am using this function cause my result is giving me to nan result
    Serial.println("Failed to read from DHT sensor!");
    return;
  }

  float hif = dht.computeHeatIndex(f, h);
  float hic = dht.computeHeatIndex(t, h, false);

  Serial.print("Humidity: ");
  Serial.print(h);
  Serial.print(" %\t");
  Serial.print("Temperature: ");
  Serial.print(t);
```

```
 Serial.print(" *C ");
  Serial.print(f);
  Serial.print(" *F\t");
  Serial.print("Heat index: ");
  Serial.print(hic);
  Serial.print(" *C ");
  Serial.print(hif);
  Serial.println(" *F");
}
```

Program Output:



DHT11 Specifications:

- **Operating Voltage:** 3.5V to 5.5V
- **Operating current:** 0.3mA (measuring) 60uA (standby)
- **Output:** Serial data
- **Temperature Range:** 0°C to 50°C
- **Humidity Range:** 20% to 90%
- **Resolution**: Temperature and Humidity both are 16-bit
- **Accuracy**: ±1°C and ±1%

Applications:

- Measure temperature and humidity
- Local Weather station
- Automatic climate control
- Environment monitoring