

## Medical Electronics - Laboratory 3

### Humidity and temperature sensor

#### Introduction

DFRobot DHT11 Temperature & Humidity Sensor features a temperature & humidity sensor complex with a calibrated digital signal output. It includes a resistive-type humidity measurement component and an NTC temperature measurement component, and connects to an 8-bit microcontroller, offering fast response, anti-interference ability and cost-effectiveness.

#### Exercise 1

Connect the DHT11 sensor to Arduino Uno board according to scheme from Figure 1. You may use a breadboard for connection as it will be useful for next exercises. Use a code from Listing 1 to read temperature and humidity values and display them in serial monitor.

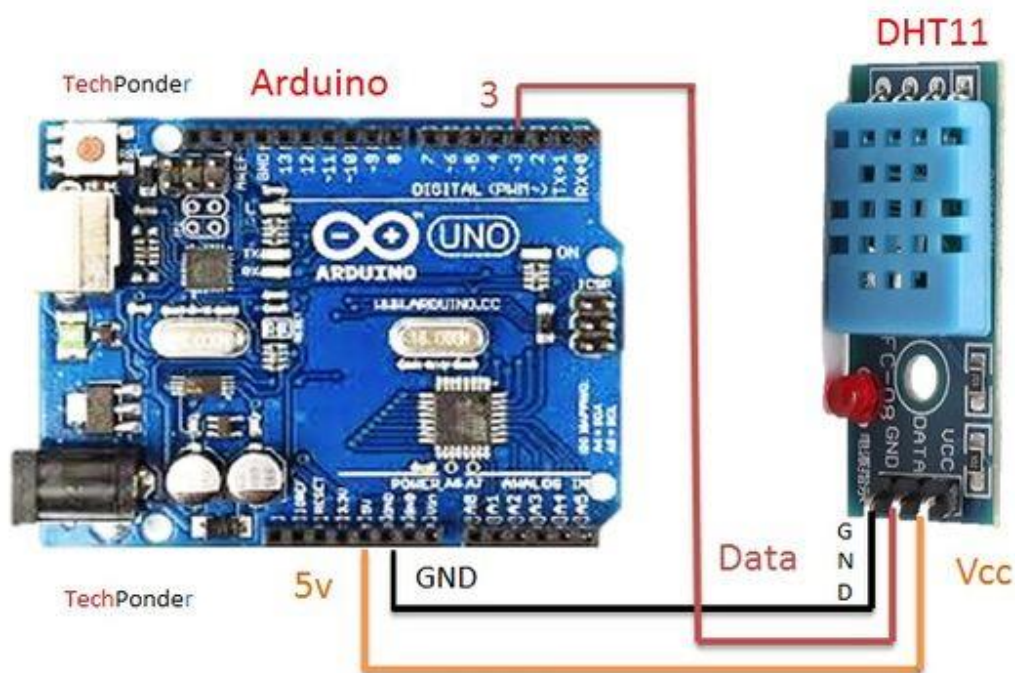


Figure 1 Connection of DHT11 sensor

### Listing 1

```
#include<dht.h>
dht DHT;

#define DHT11_PIN 3

void setup()
{
    Serial.begin(9600);
}

void loop()
{
    // READ DATA
    int chk = DHT.read11(DHT11_PIN);
    Serial.println(" Humidity " );
    Serial.println(DHT.humidity, 1);
    Serial.println(" Temperature ");
    Serial.println(DHT.temperature, 1);
    delay(2000);
}
```

## Exercise 2

Use knowledge from Laboratory 2 to display temperature value on the 2-digit 7-segment display. Connect the circuit (connection of 7-segment displays is given in Figure 2) and modify the listing.

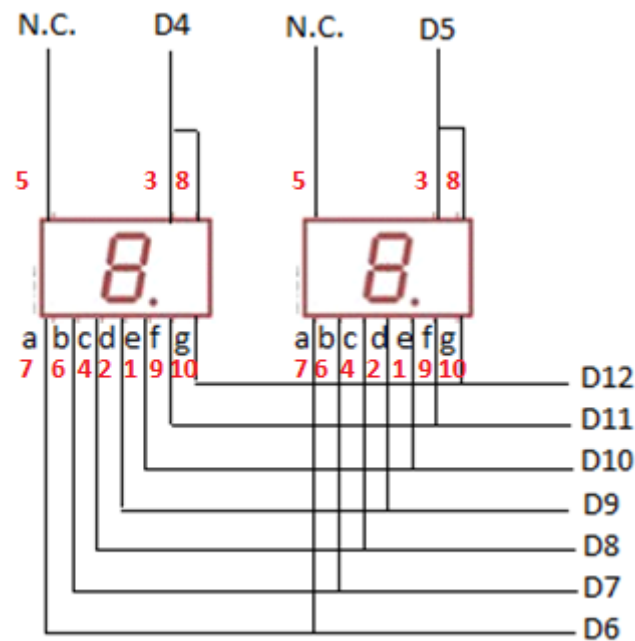


Figure 2 Connection of 7-segment displays to Arduino pins

## Exercise 3

Use knowledge from Laboratory 1 to connect Button and enable switching between Temperature and Humidity showed on 7-segment display. Connect the circuit and modify the listing. The connection of the push button is presented in Figure 3.

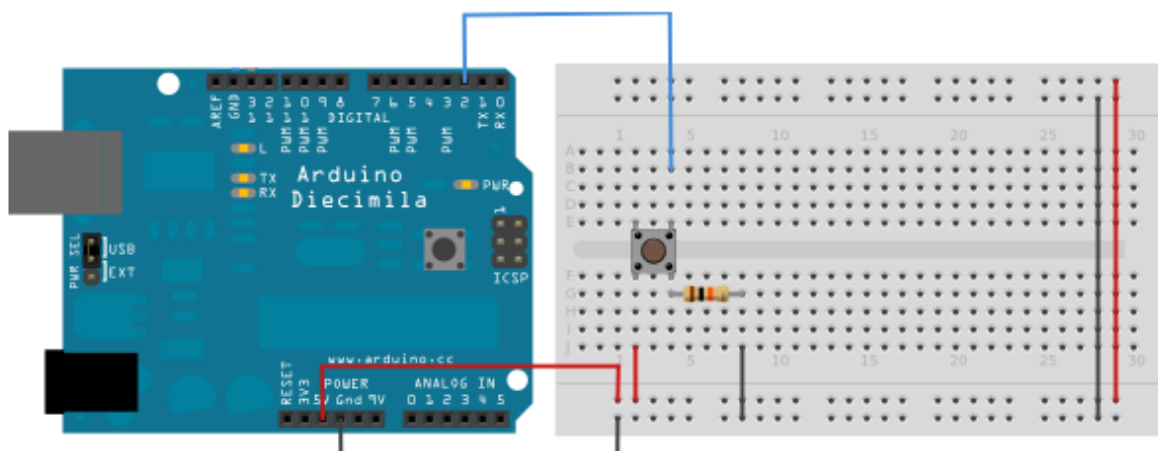


Figure 3 Connection of the push button

Final result and connection scheme are shown in Figures 4 and 5.

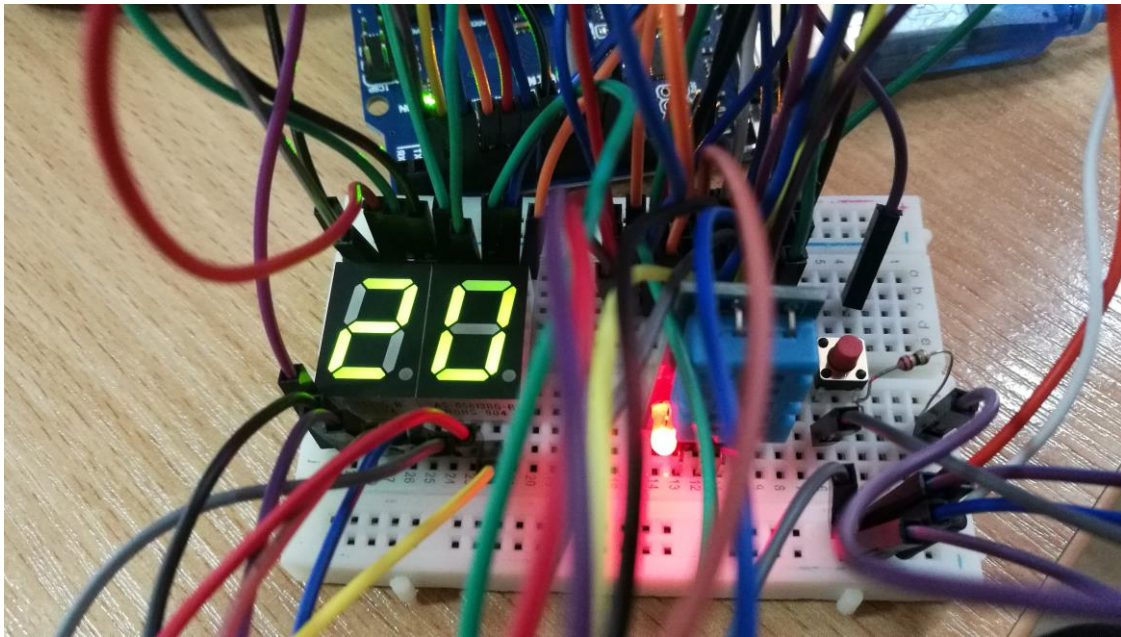


Figure 4 Connected circuit

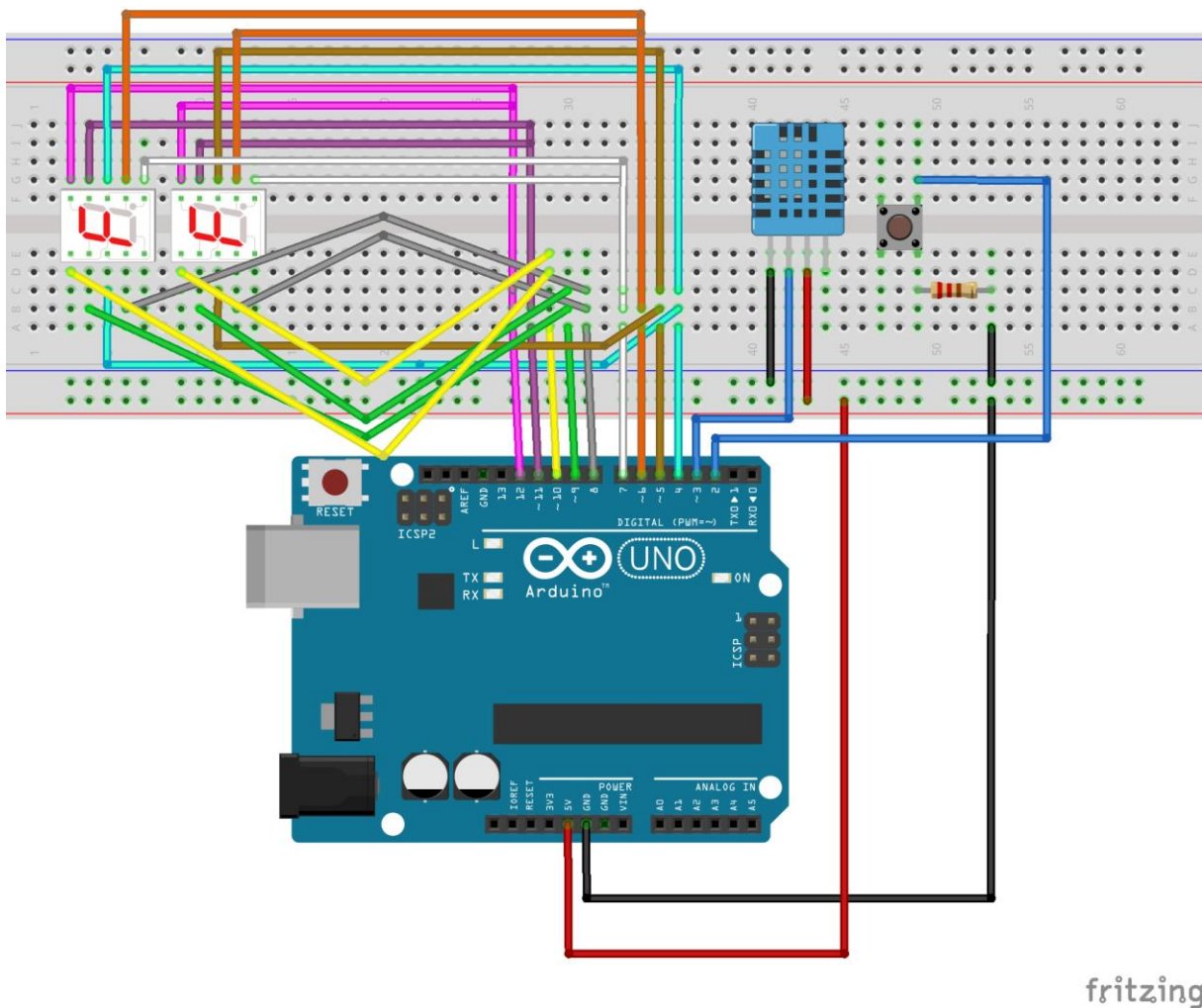


Figure 5 Schematics of the circuit with DHT11 sensor, 7-segment display and pushbutton