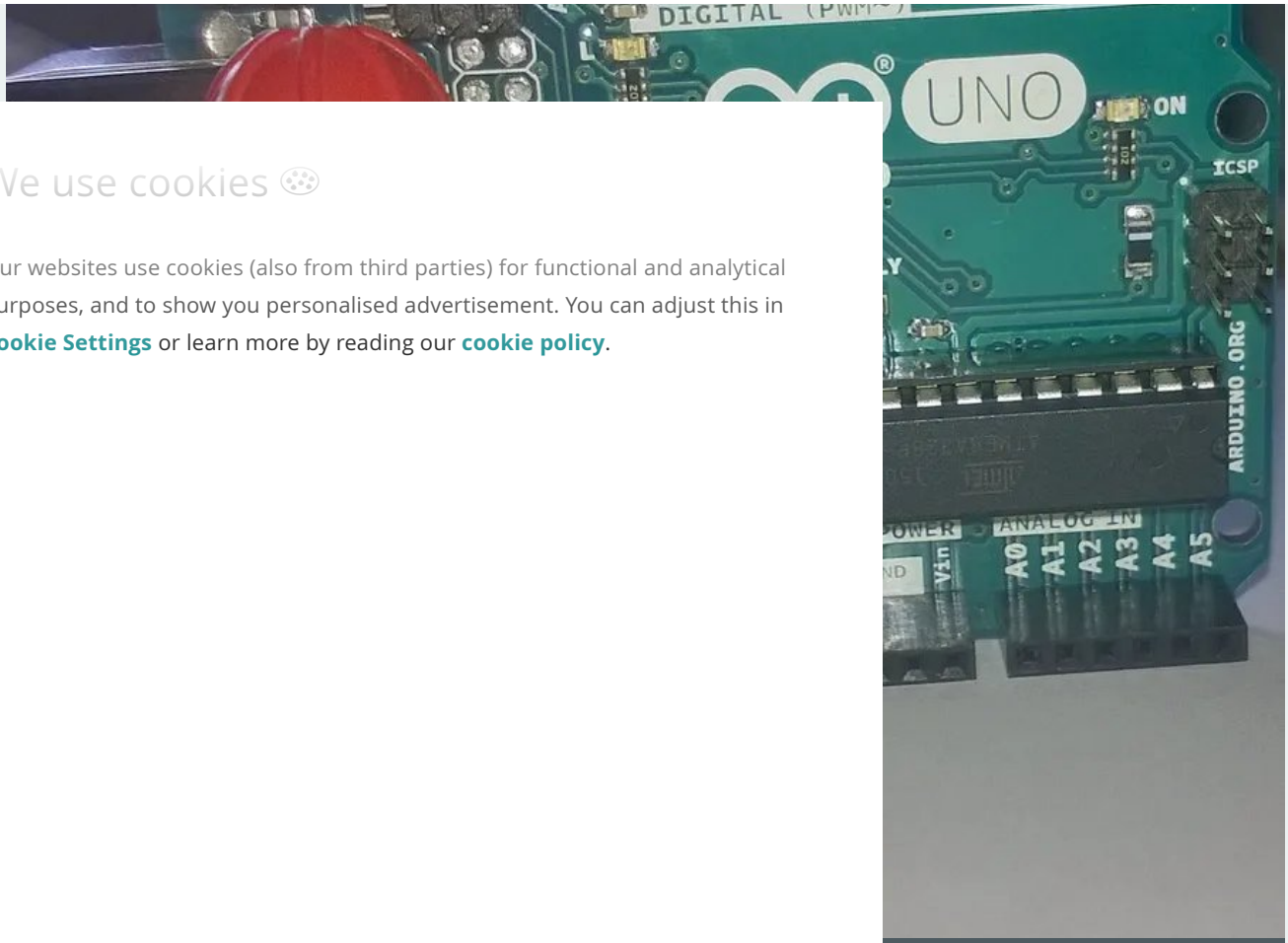


ermistor?!

× 1

Resistor 10k ohm × 1

Arduino UNO × 1

Jumper wires (generic) × 1

Breadboard (generic) × 1

APPS AND ONLINE SERVICES

Arduino IDE

Arduino Web Editor

ABOUT THIS PROJECT

How easy is it to use a thermistor?!

In this article I will explain how to use a thermistor. First of all, what is it a Thermistor? A **thermistor** is a type of resistor *whose resistance is dependent on temperature.* There are two opposite types of thermistor:

- PTC (**P**ositve **T**emperature **C**oefficent), resistance increases as temperature rises
- NTC (**N**egative **T**emperature **C**oefficent), resistance decreases as temperature rises

In this case I use NTC.

A little bit of math.

To calculate the thermistor resistance using a simple formula called *equation with parameter B* (**with only NTC termistor**).

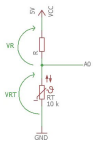
$$RT = R0\, e^{B\left[\frac{1}{T} - \frac{1}{T0}\right]}$$

Where:

- `e` is the base of natural logarithm
- `R0` is the resistance of the thermistor measured at the temperature T0
- `B` is a constant coefficient that depends on the characteristics of the

material, it is a constant expressed in K, and its value is indicated by the manufacturers on the technical sheets

To calculate the temperature we need know the resistance RT using the Ohm's laws.



This is a schematic version of circuit.

```
RT = VRT / (VR/R)
```

Now we have all the data to calculate the temperature.

$$T=\frac{1}{\frac{\ln(\frac{RT}{R0})}{B}+\frac{1}{T0}}$$

Remember to convert all parameters (for example T0) to Kelvin before the calculations, and also the result is in Kelvin.

This is the result.

CODE

Thermistor Arduino

```
//Thermometer with thermistor

/*thermistor parameters:
 * RT0: 10 000 Ω
 * B: 3977 K +- 0.75%
 * T0:  25 C
 * +- 5%
 */

//These values are in the datasheet
#define RT0 10000   // Ω
#define B 3977      // K
//--------------------------------------


#define VCC 5    //Supply voltage
```

SCHEMATICS

termistore_bb.jpg

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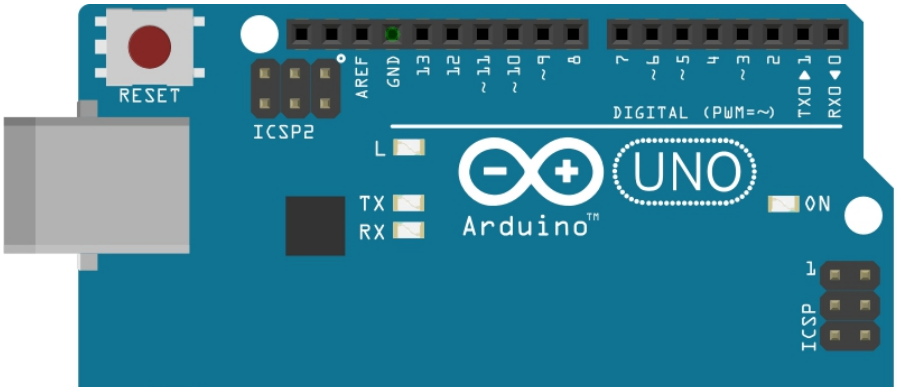
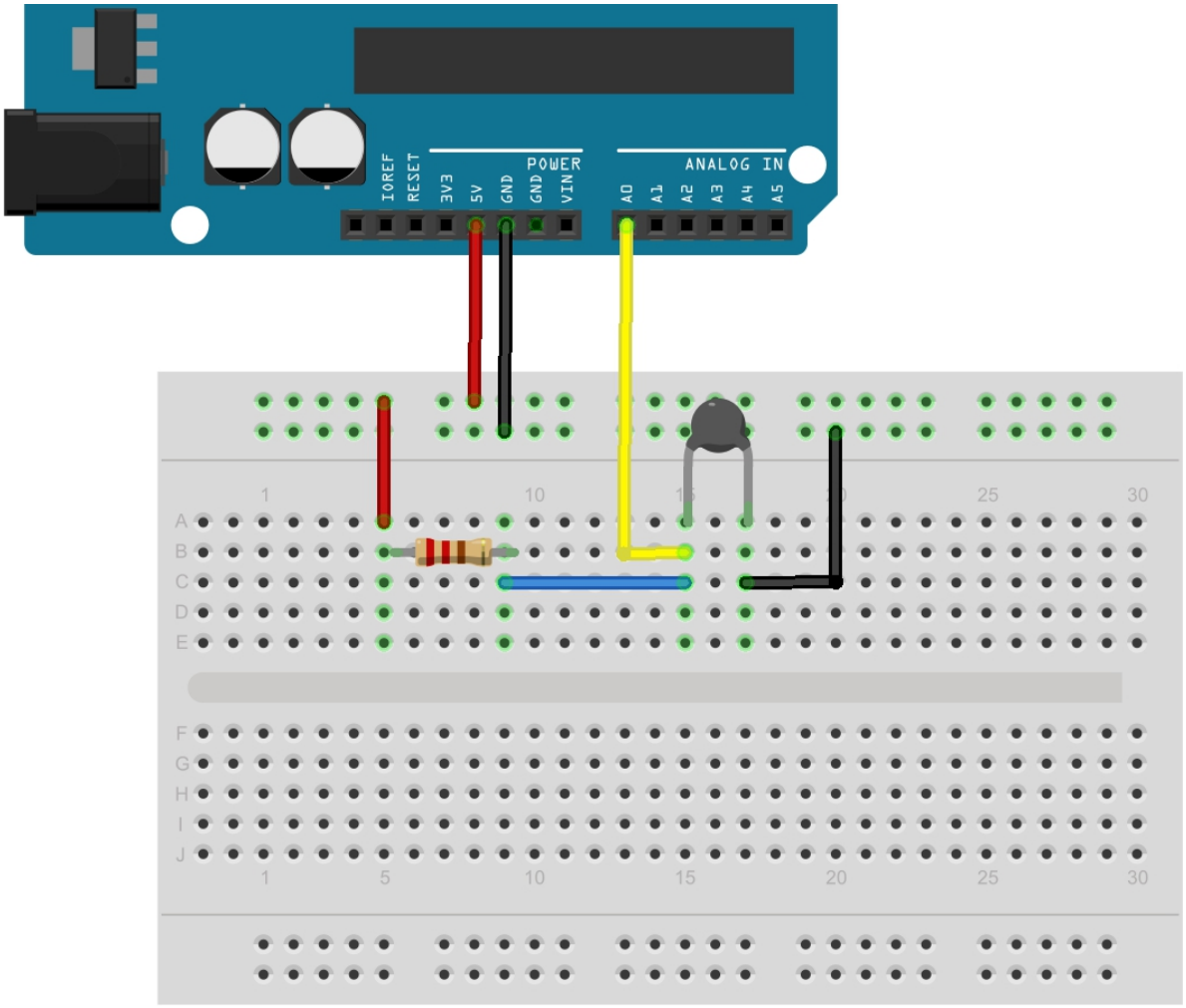
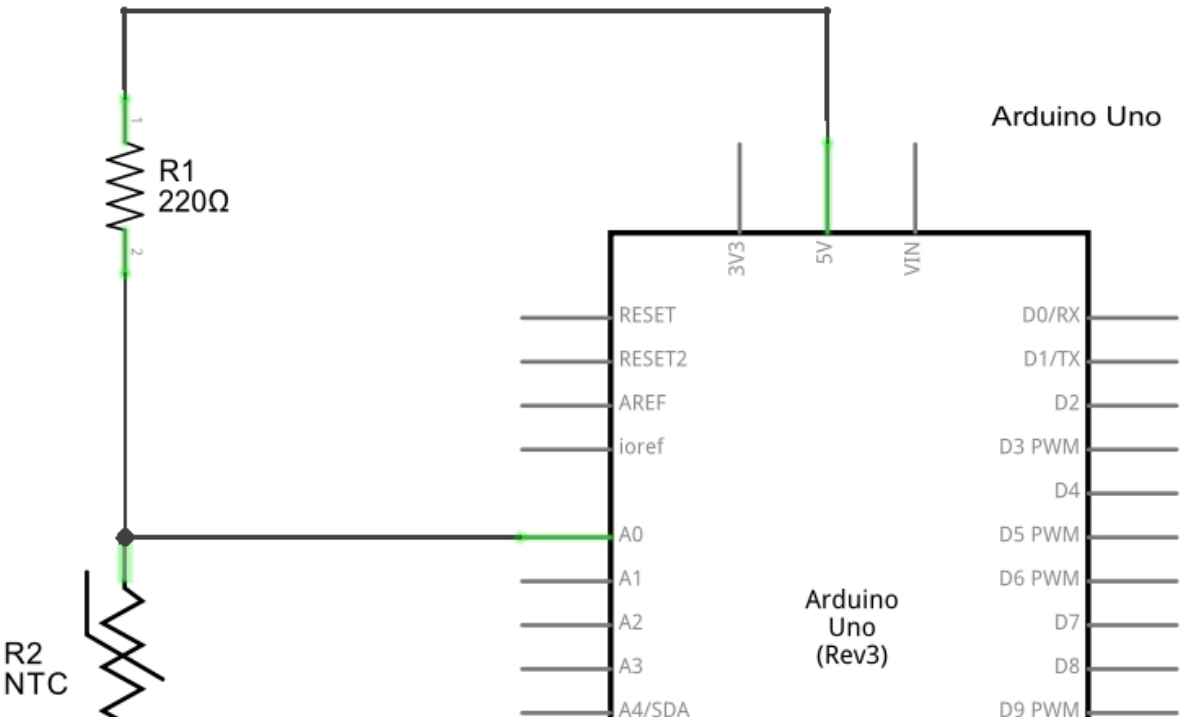
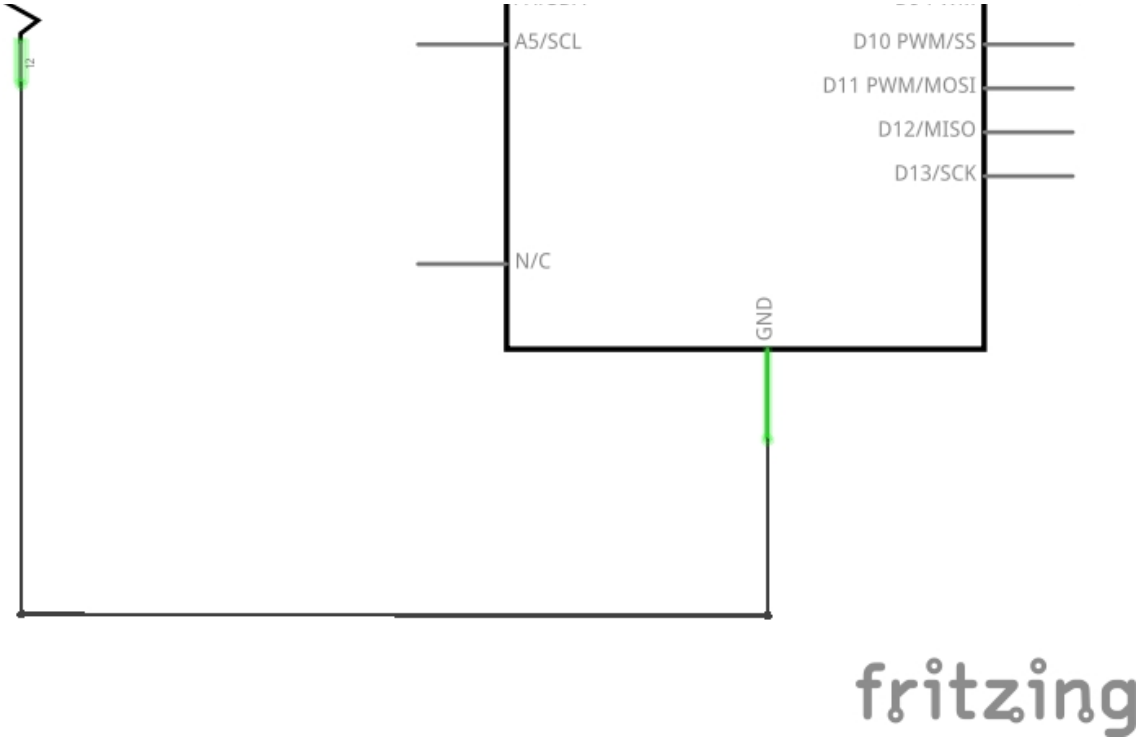




termistore_schem.jpg

DOWNLOAD





COMMENTS

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Arnov Sharma
2 years ago

Ma ma mia very naice

Praneshvar_4767
2 years ago

How to calculate resistance of thermistor

aigless
2 years ago

Your code not work. I tried the temperatures goes inverted.
i tried panstamp library and works. what's wrong?

panStamp library contact@panstamp.com

Viiliainen
2 years ago

This works only for NTC.
For PTC you need to create polynome or function like this :
https://www.schmidt-welt.net/weblog/arduino-and-kty81-210/
..with parameters matching your sensor.

Binary_Designer
2 years ago

Thank you very much! It was very nicely explained and worked right away.

---

waldenjryan
a year ago

Hi there the schematic shows a 220 resistor. Unless i'm mistaken (an i often am) i think it should be a 10K resistor

1 thank

AUTHOR

Marcazzan_M
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