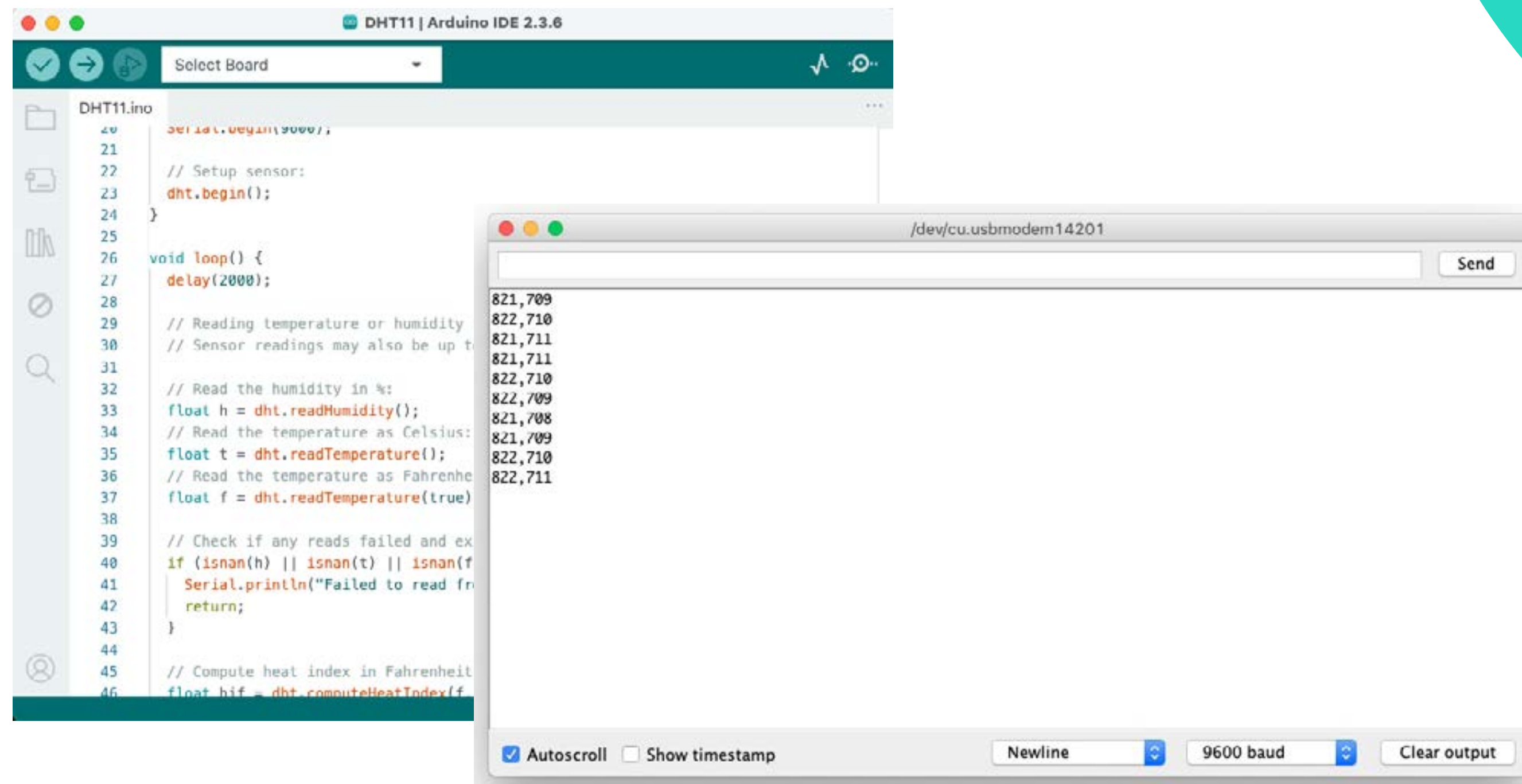


# DATA LOGGING WITH ARDUINO

DHT11 sensor + SDCard module + RTC module  
Recording CSV files in a micro SD Card.



The screenshot displays the Arduino IDE 2.3.6 interface. The left sidebar shows the file explorer with 'DHT11.ino' selected. The main editor window contains the following code:

```
20 Serial.begin(9600);
21
22 // Setup sensor:
23 dht.begin();
24 }
25
26 void loop() {
27   delay(2000);
28
29   // Reading temperature or humidity
30   // Sensor readings may also be up to 1 second
31
32   // Read the humidity in %:
33   float h = dht.readHumidity();
34   // Read the temperature as Celsius:
35   float t = dht.readTemperature();
36   // Read the temperature as Fahrenheit:
37   float f = dht.readTemperature(true);
38
39   // Check if any reads failed and ex
40   if (isnan(h) || isnan(t) || isnan(f))
41     Serial.println("Failed to read from DHT11 sensor");
42   return;
43 }
44
45 // Compute heat index in Fahrenheit
46 float hif = dht.computeHeatIndex(f, h);
```

The serial monitor window, titled '/dev/cu.usbmodem14201', shows the following output:

```
821,709
822,710
821,711
821,711
822,710
822,709
821,708
821,709
822,710
822,711
```

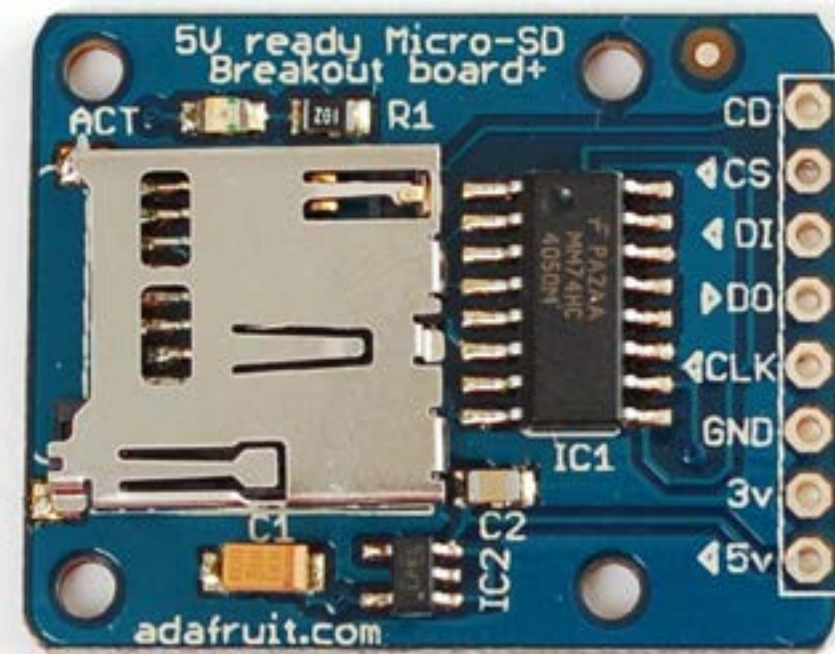
The serial monitor settings at the bottom are: Autoscroll (checked), Show timestamp (unchecked), Newline (selected), 9600 baud, and Clear output (button).





# DATA LOGGING WITH ARDUINO

## HARDWARE COMPONENTS



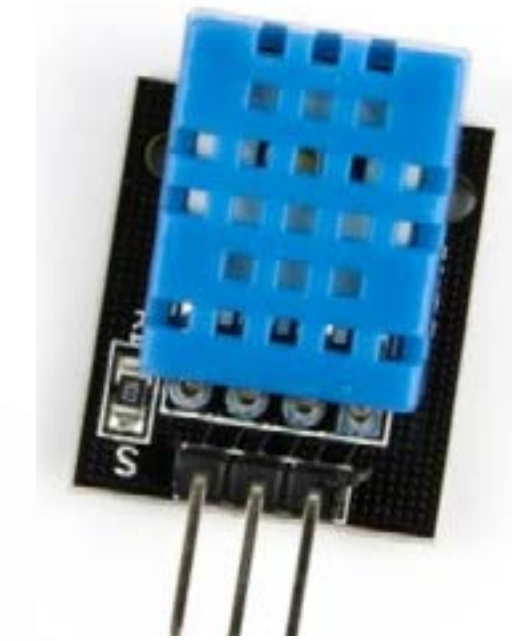
SD Card Module



Arduino UNO board



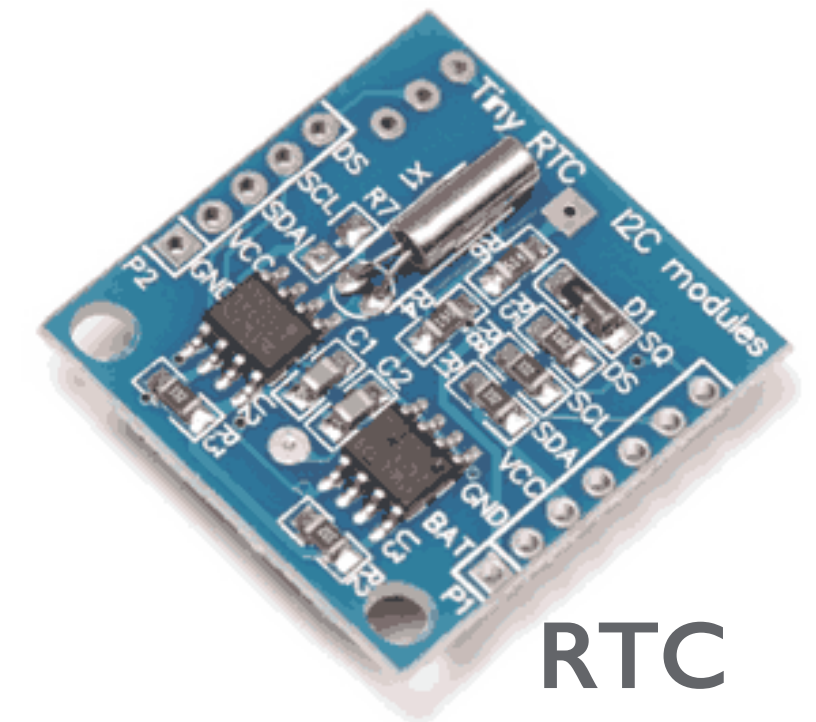
Jumpers



DHT11 Sensor



BAT 3V



RTC Module

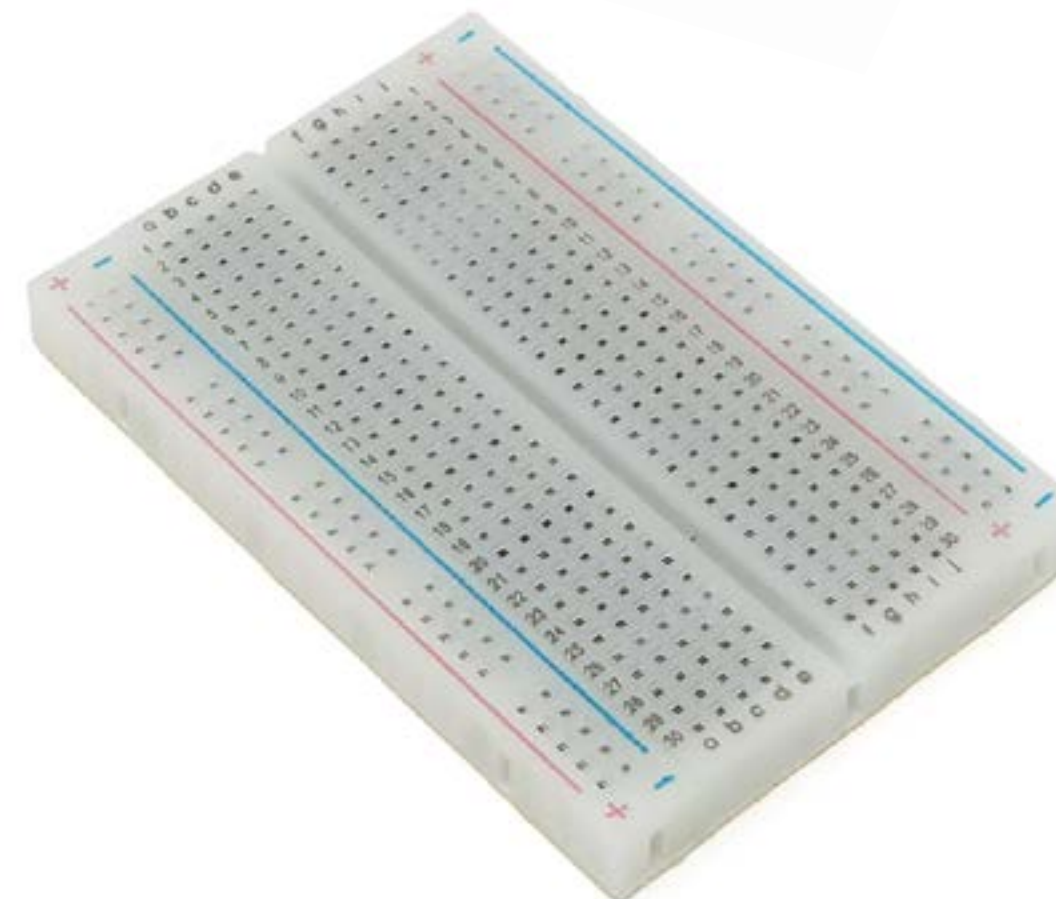


Micro SD Card

LED



220ohms resistor



Breadboard



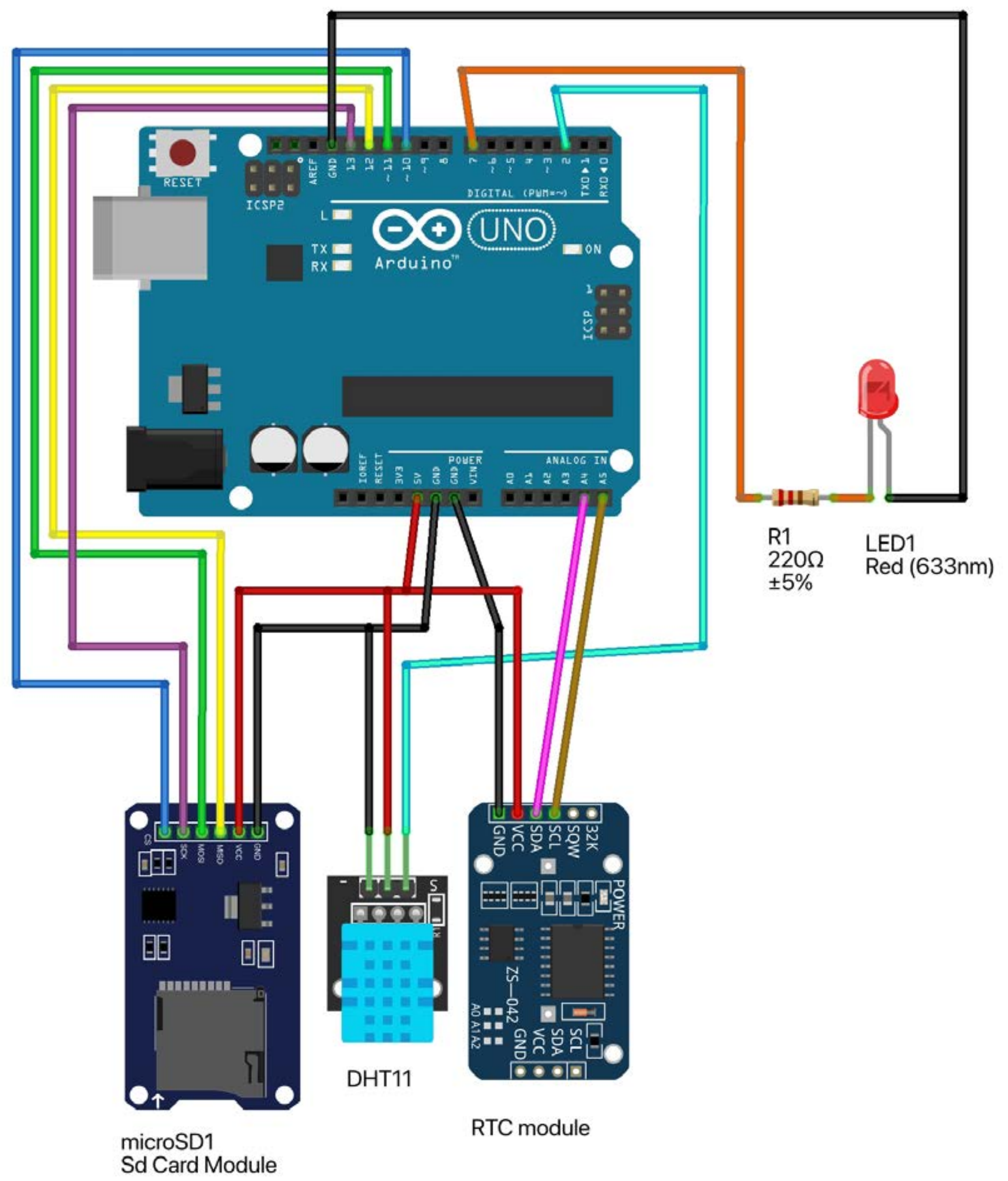
Power Bank 5V



# DATA LOGGING WITH ARDUINO

## WIRING

ARDUINO		COMPONENT
GND	—	GND (SD card module)
pin 13	—	CLK (SD card module)
pin 12	—	Do (SD card module)
pin 11	—	Di (SD card module)
pin 10	—	CS (SD card module)
5V	—	5V (SD card module)
pin 2	—	Signal pin (DHT sensor)
5V	—	5V or VCC (DHT sensor)
GND	—	GND (DHT sensor)
pin A4	—	SDA (RTC module)
pin A5	—	SCL (RTC module)
5V	—	VCC (RTC module)
GND	—	GND (RTC module)
pin 7	—	resistor 220 ohms — LED(-)
GND	—	LED (+)



## CODING

1. Install the following libraries if you haven't done it already:

- RTClib
- DHT
- SD
- Adafruit\_Sensor
- Adafruit\_BusIO

Download libraries package [here](#)

Importing .ZIP libraries to Arduino. [Instructions here](#)

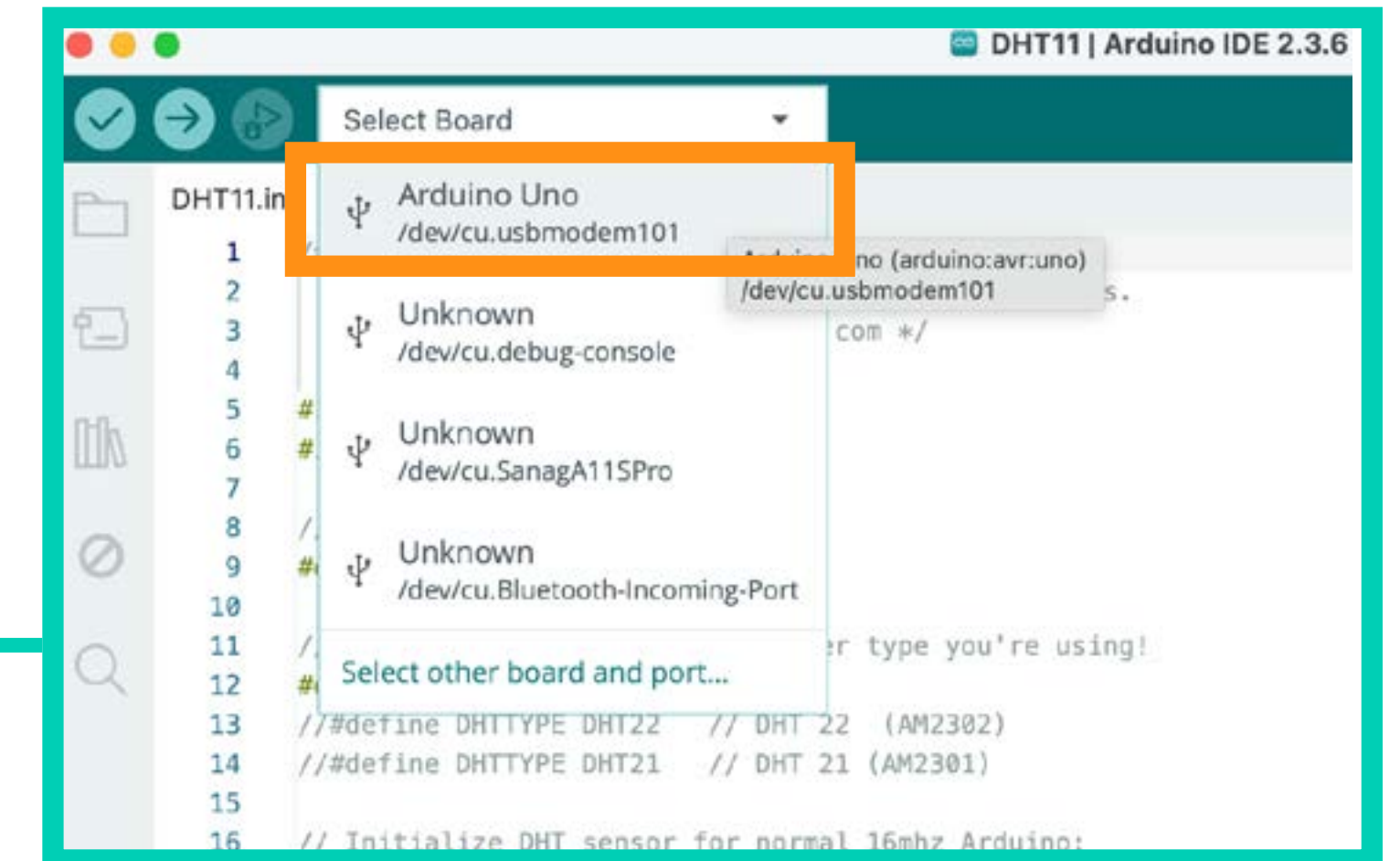
2. Coding

Download Data-Logging-Arduino-Code [here](#)

# DATA LOGGING WITH ARDUINO

## TRY AND TEST

- Insert the SD card into the SD card module (if you haven't done it already )
- Plug The Arduino Board to your computer
- Open the Arduino file (.ino) that you previously downloaded
- Select the **Arduino UNO** Board
- Upload the code to the board



## NEXT STEPS

**CONGRATULATIONS!** You have built an environmental sensor device that records data every 5 seconds and saves it in .CSV format.

### WHAT TO DO NEXT?

You can now modify the code to customise it according to your own ideas, goals, or project requirements. For example:

- Adjust the data logging interval (e.g. every 1 minute instead of every 5 seconds)
- Change the sensor output units (e.g. from Celsius to Fahrenheit)
- Modify RTC usage (e.g. log only the date, not the time)
- Alter LED behaviour
- Integrate additional sensors for more environmental data

### NEED MORE HELP?

Book an induction with a hackSpace technician and/or approach the hackSpace workshop.

