



Système d'entretien d'une plante

Présentation Projet

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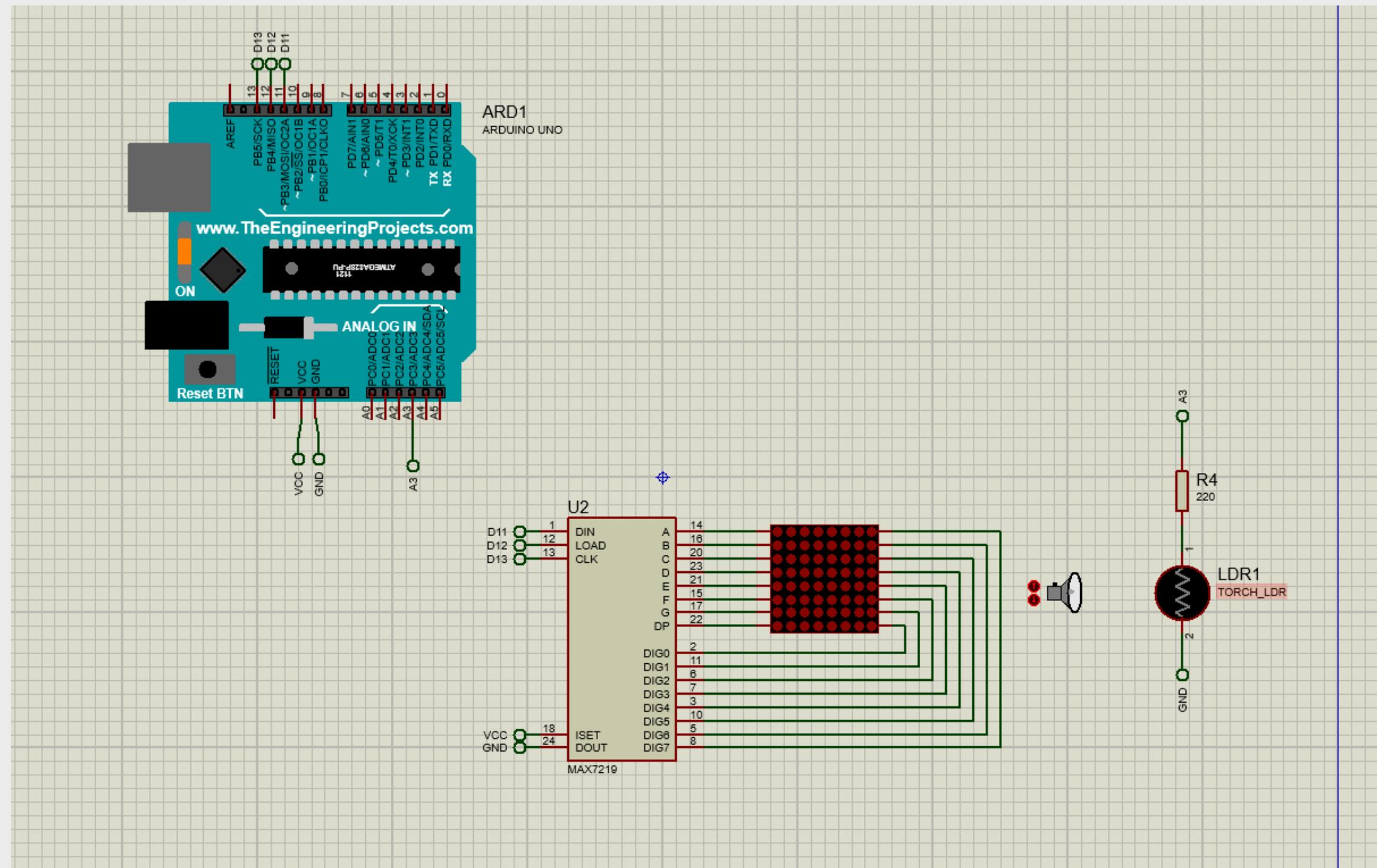
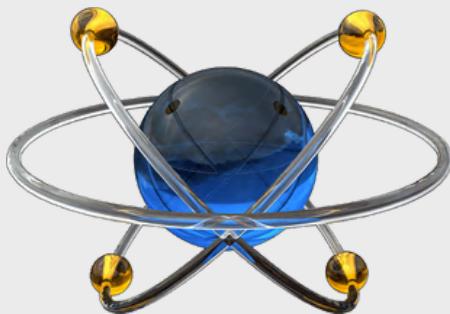
2024/2025

PLAN

- 01 Capteur de Lumière
- 02 Capteur de température et d'humidité
- 03 Capteur de niveau d'eau
- 04 Capteur d'humidité du sol
- 05 L'ensemble du système

01 Capteur de Lumière

- Capteur de lumière
- Arduino
- Matrix LED 8x8
- MAX7219
- Résistance



01 Capteur de Lumière

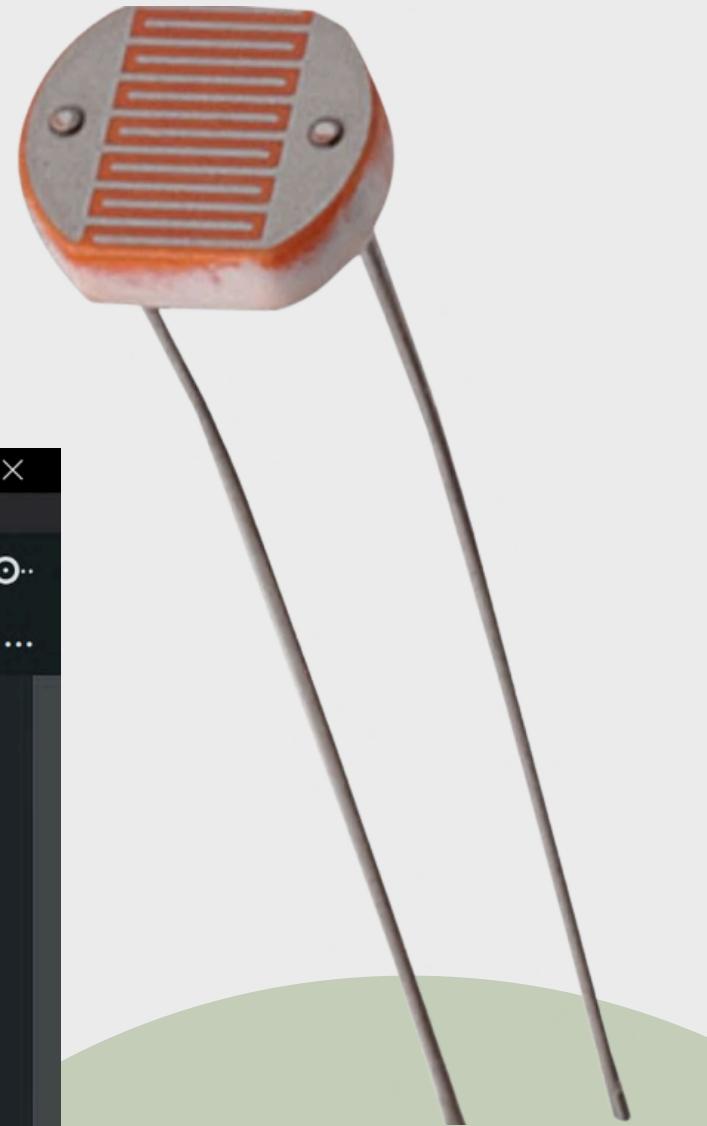


ARDUINO

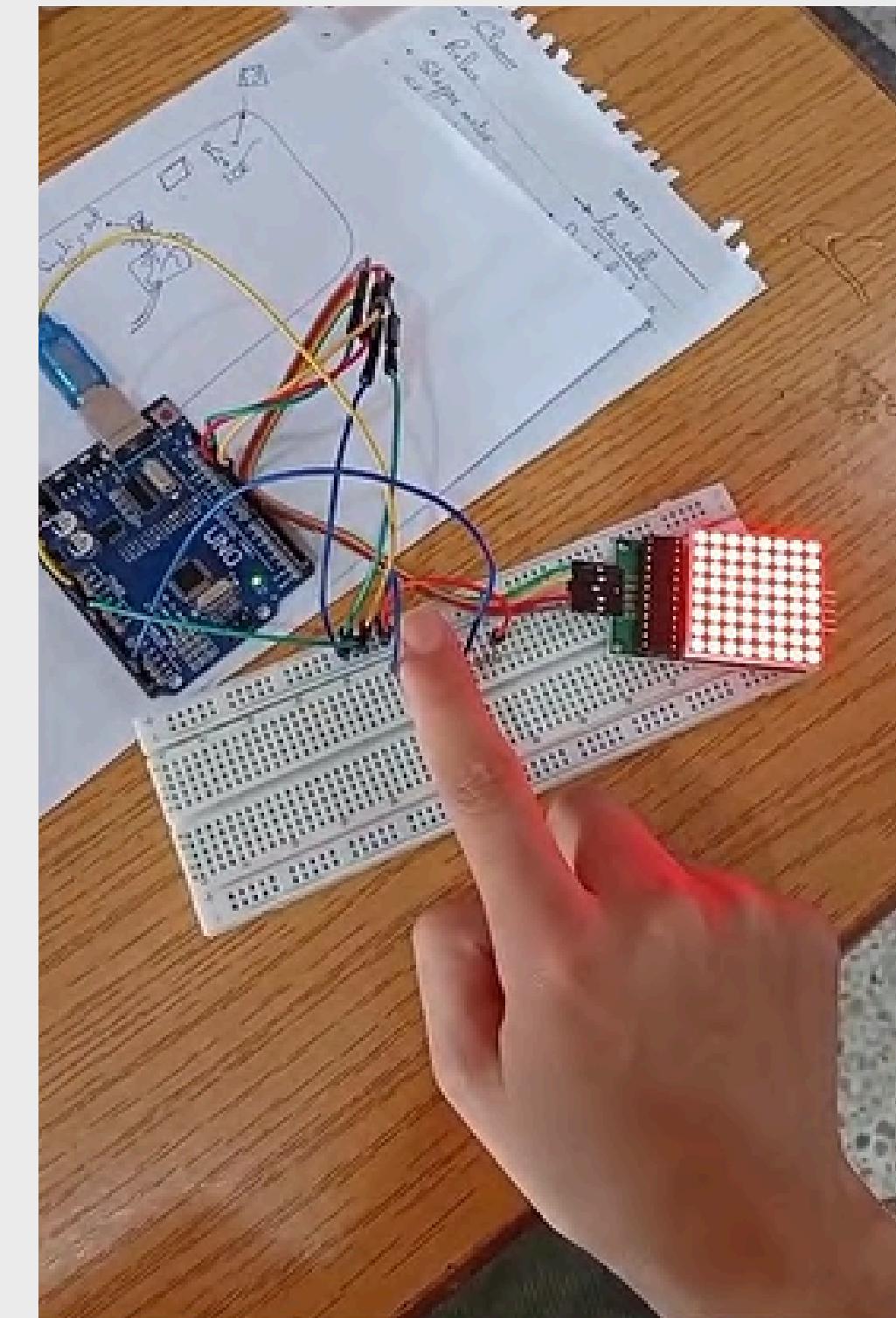
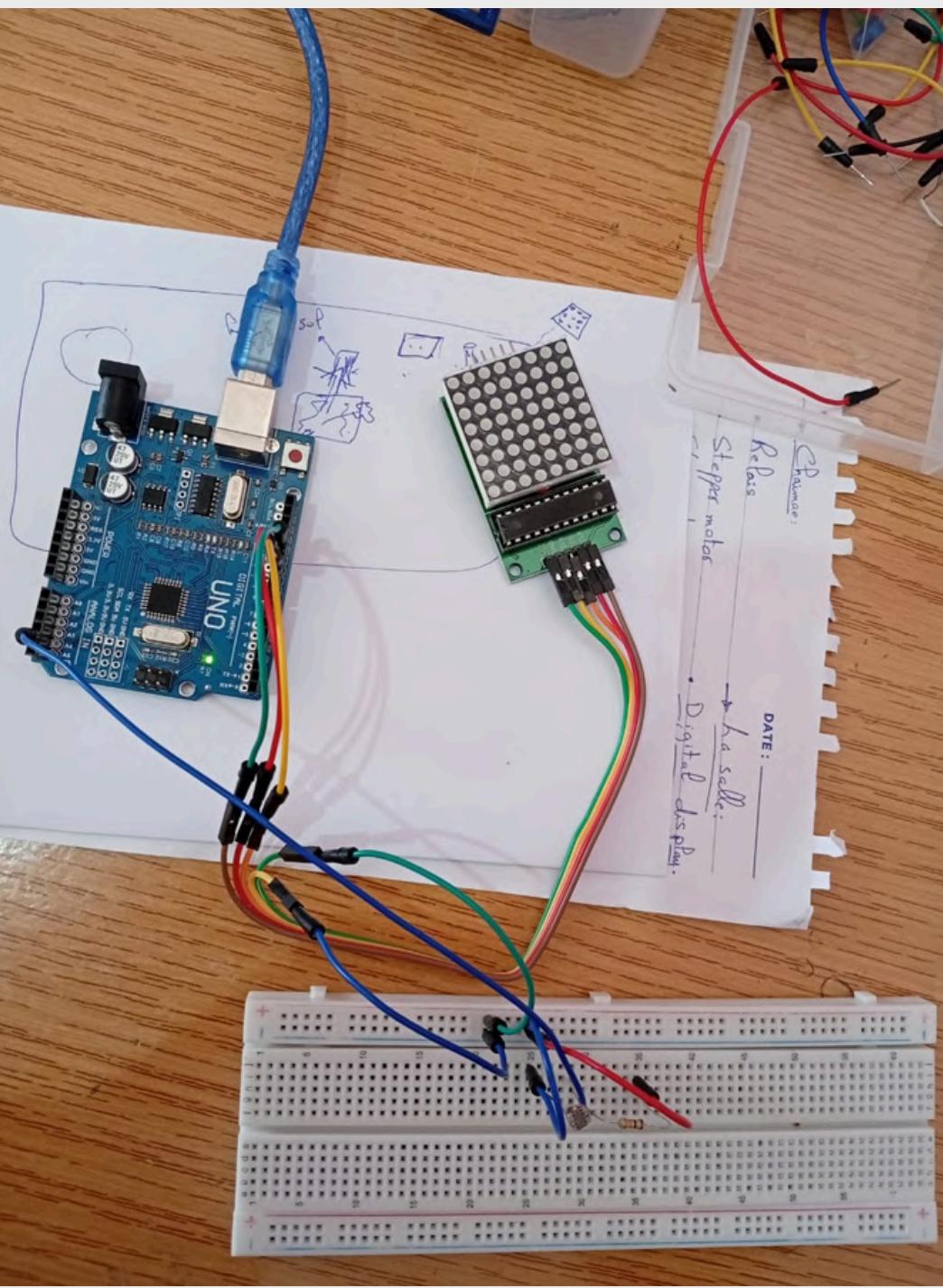
The screenshot shows the Arduino IDE interface with the following code:

```
sketch_may13a | Arduino IDE 2.3.3
Fichier Modifier Croquis Outils Aide
Arduino Uno
sketch_may13a.ino
1 #include <LedControl.h>
2 // Pins: DIN, CLK, CS, Number of Matrices (1 for 8x8)
3 LedControl lc = LedControl(11, 13, 12, 1);
4
5 int LDR_PIN = A4;
6 int ldrThreshold = 500; // Adjust based on testing
7
8 void setup() {
9     Serial.begin(9600);
10    lc.shutdown(0, false); // Wake up the MAX7912
11    lc.setIntensity(0, 10); // Max brightness (0-15)
12    lc.clearDisplay(0); // Clear the display
13 }
14
15 void loop() {
16     int ldrValue = analogRead(LDR_PIN);
17     Serial.println(ldrValue); // Only print LDR value
18
19     if (ldrValue < ldrThreshold) {
20         delay(3000);
21         // Turn ON ALL LEDs (all rows + all columns)
22         for (int row = 0; row < 8; row++) {
23             lc.setRow(0, row, 0b11111111); // Binary 255 = ALL LEDs in row ON
24         }
25     } else {
26         lc.clearDisplay(0); // Turn OFF ALL LEDs
27     }
28     delay(100);
29 }
```

L 16, col 38 Arduino Uno sur COM9 [hors ligne]

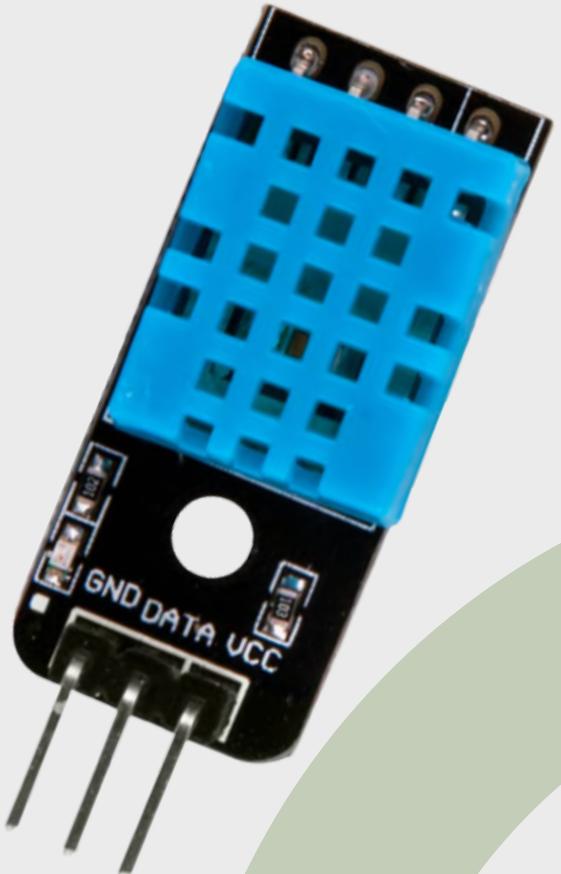


01 Capteur de Lumière

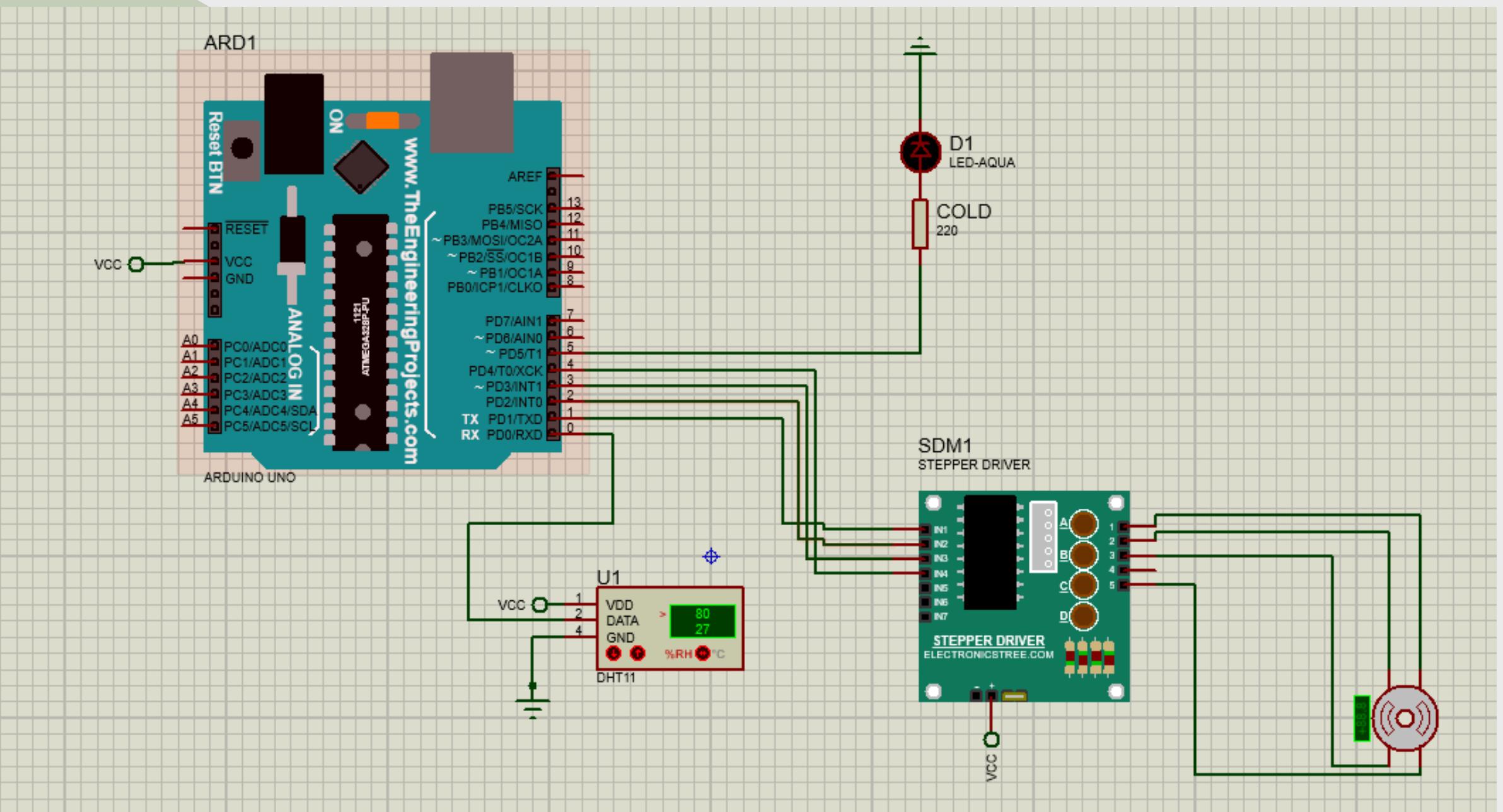


02

Capteur de température et d'humidité



- Capteur de température et d'humidité
- Arduino
- Moteur pas à pas
- LED
- Résistance



02

Capteur de température et d'humidité



```
//Biblios
#include "DHT.h"
#include <Stepper.h>

//PINS
DHT dht(0,DHT11);
const int stepsPerRevolution = 2048;
Stepper myStepper(stepsPerRevolution, 1, 2, 3, 4);
int COLD = 5;

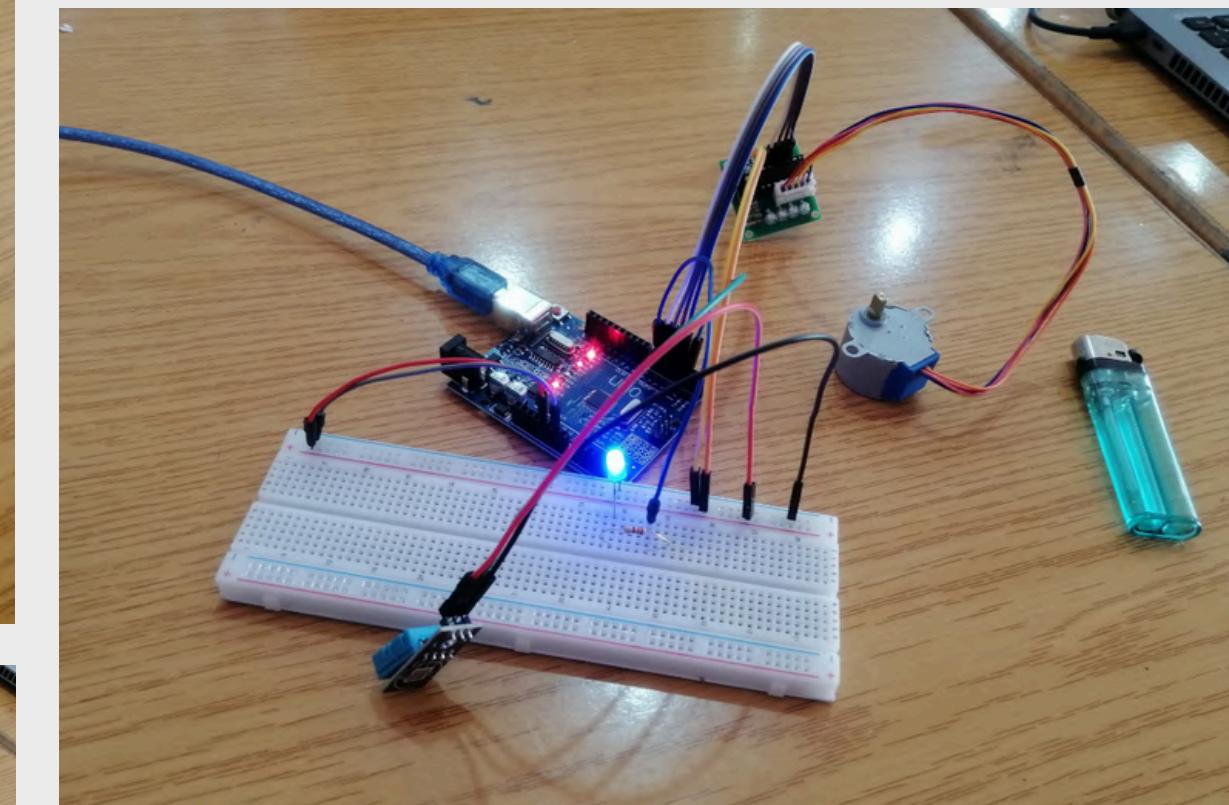
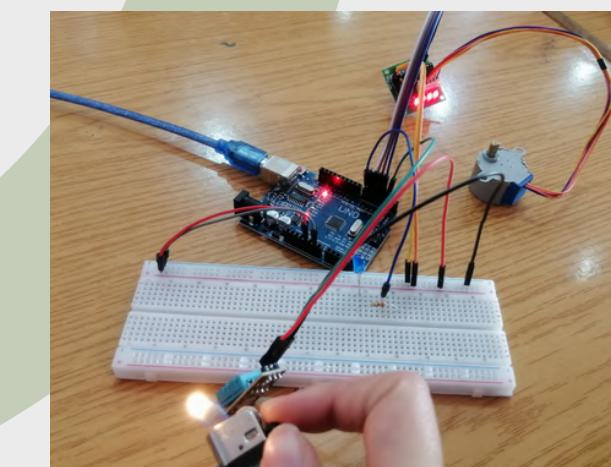
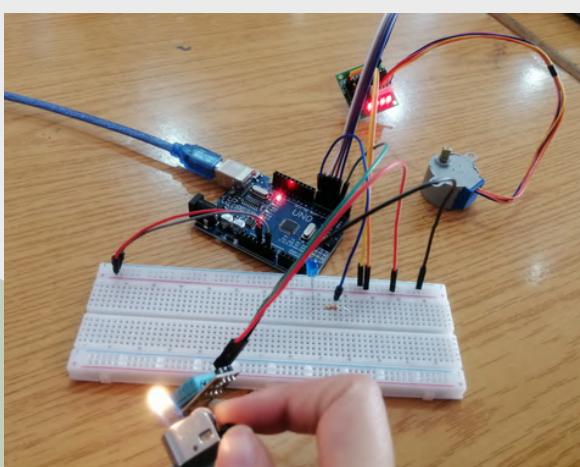
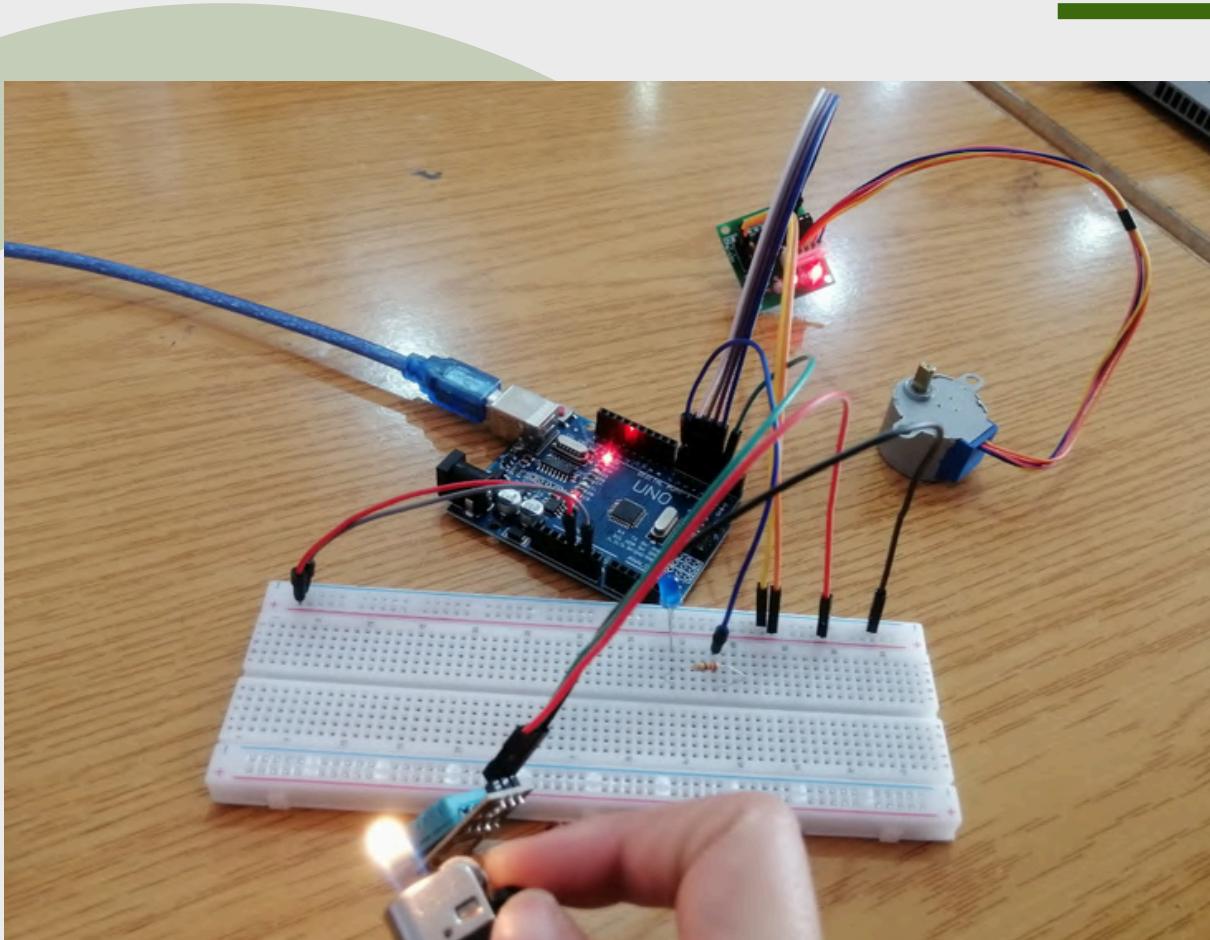
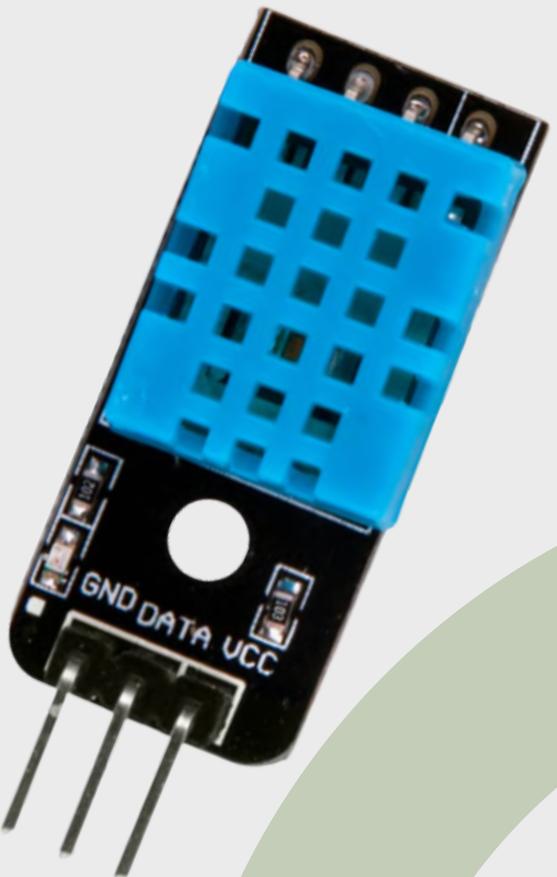
void setup() {
  // put your setup code here, to run once:
  dht.begin();
  Serial.begin(9600);
  myStepper.setSpeed(11);
  pinMode(COLD,OUTPUT);
}

void loop() {
  // put your main code here, to run repeatedly:
  float h = dht.readHumidity();
  float t = dht.readTemperature();

  while (t>10){
    myStepper.step(1);
  }
  if (t<20){
    digitalWrite(COLD,HIGH);
  }
  else {
    digitalWrite(COLD,LOW);
  }
}
```

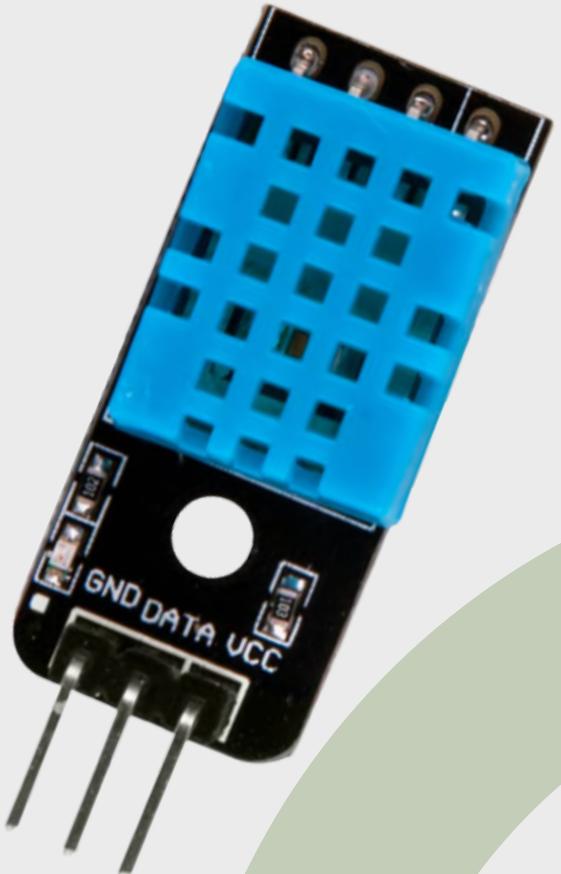
02

Capteur de température et d'humidité

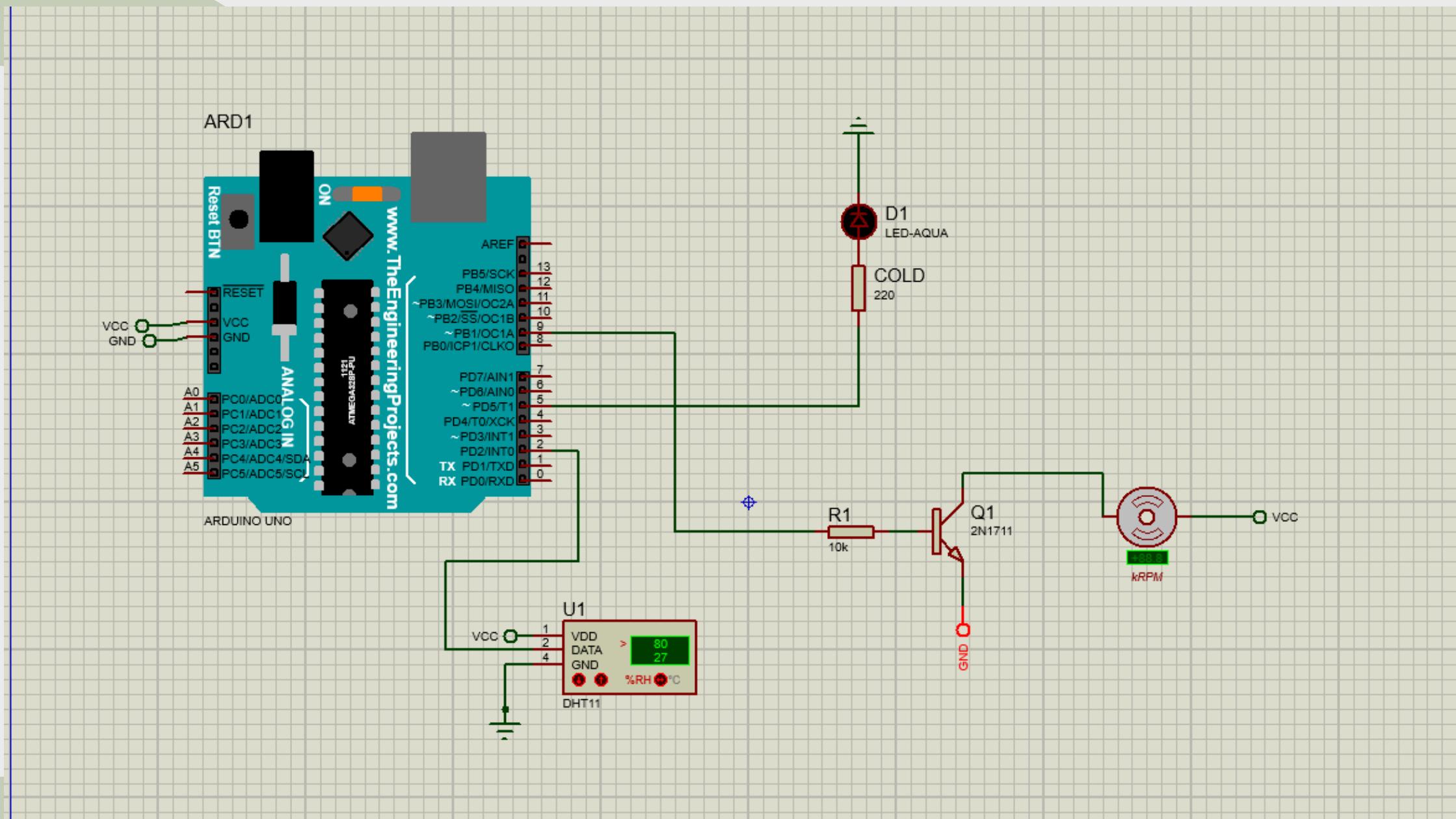


02

Capteur de température et d'humidité



- Capteur de température et d'humidité
- Arduino
- Moteur à courant continu
- LED
- Résistance



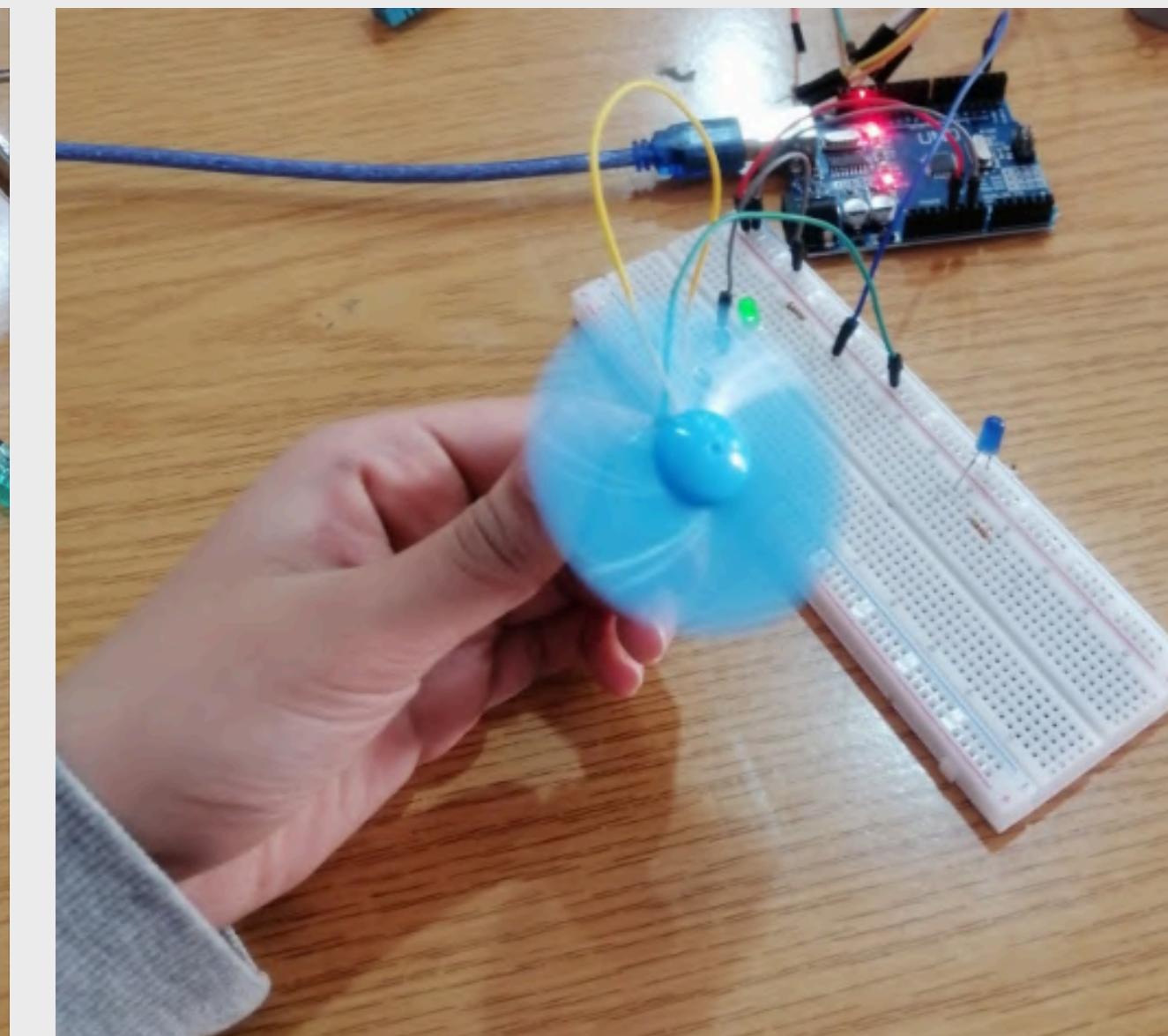
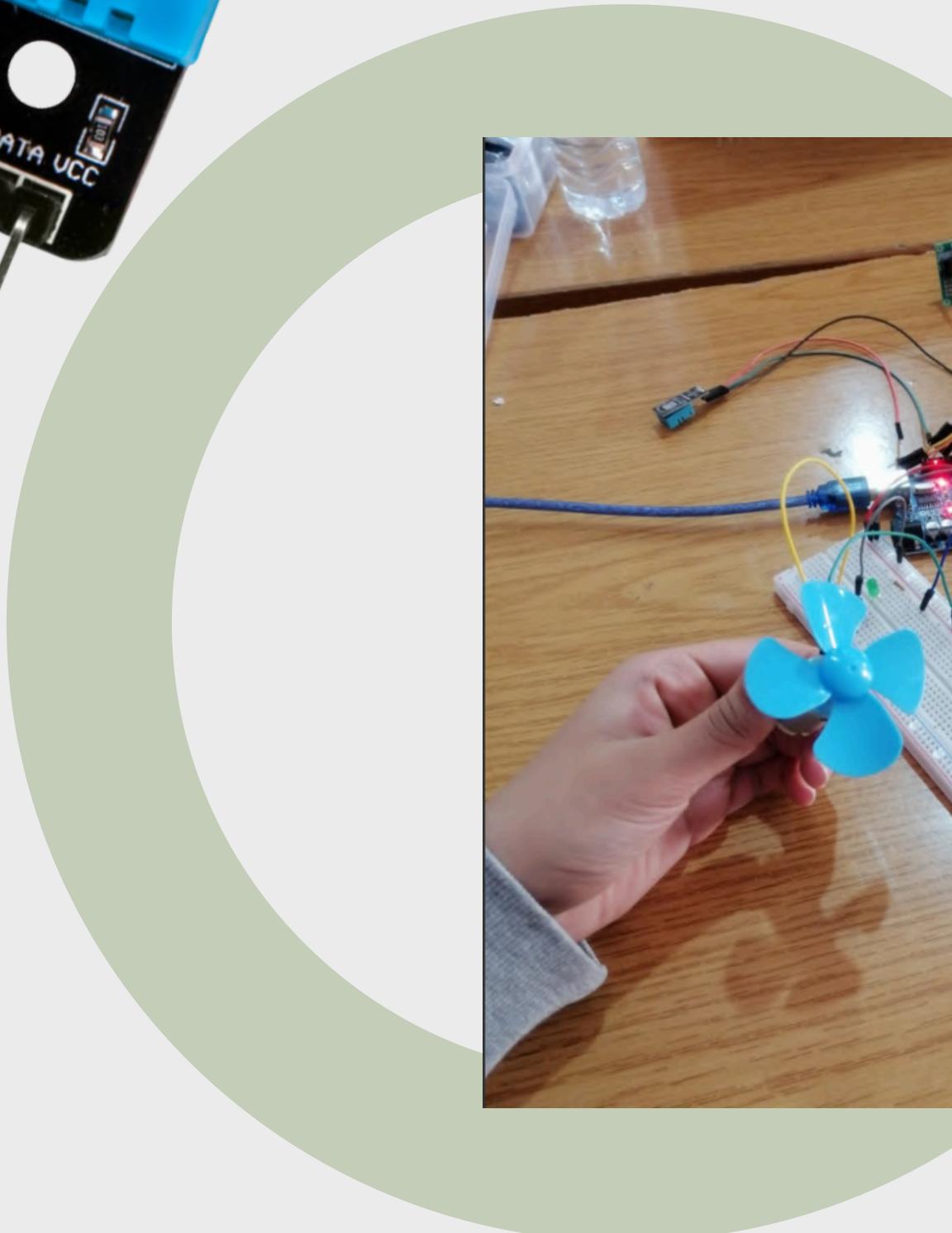
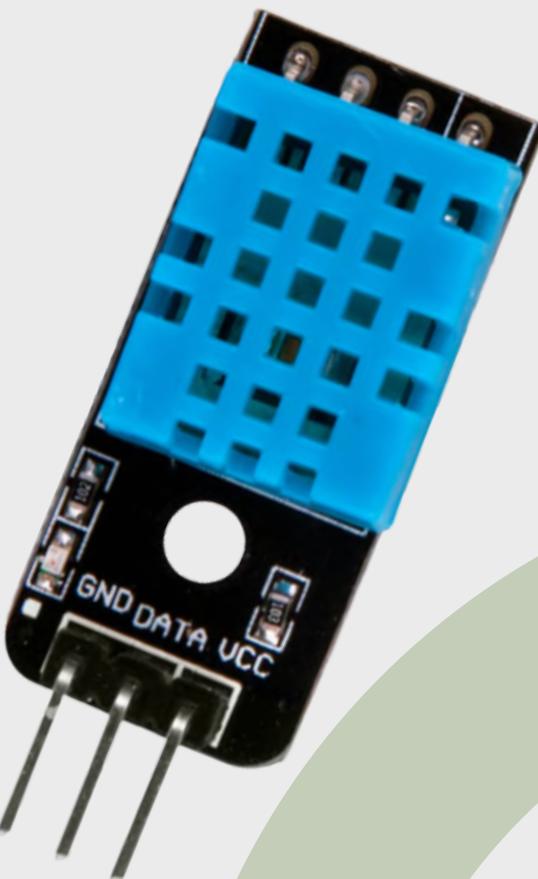
02 Capteur de température et d'humidité



ARDUINO

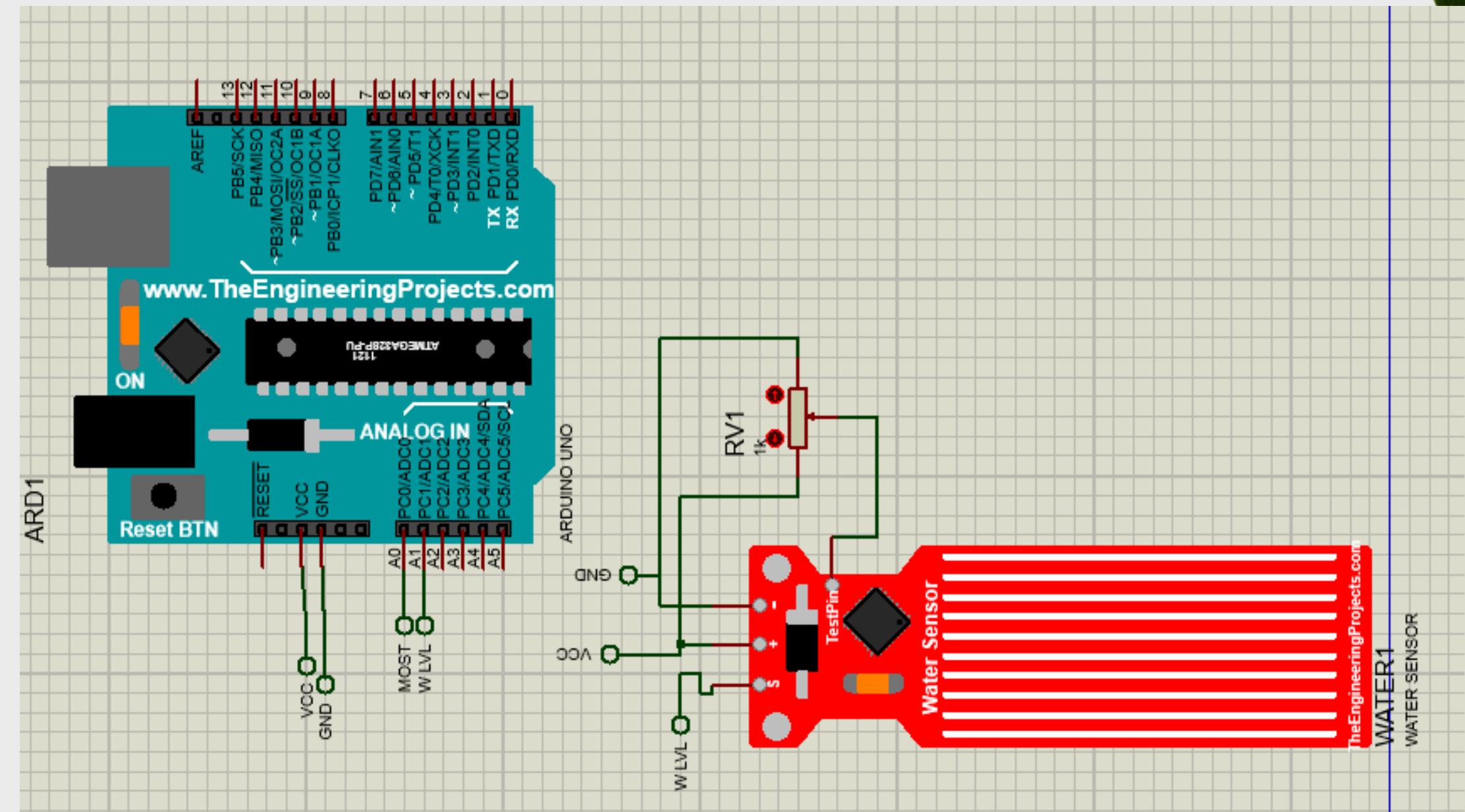
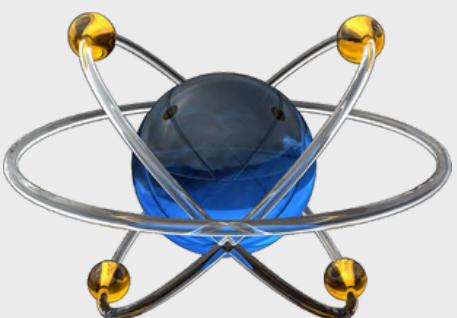
```
TemperatureHumidityDCM | Arduino IDE 2.3.6
File Edit Sketch Tools Help
TemperatureHumidityDCM.ino
1 #include "DHT.h"
2
3 #define DHTPIN 2 // DHT11 connected to digital pin 2
4 #define DHTTYPE DHT11
5
6 DHT dht(DHTPIN, DHTTYPE);
7
8 int motorPin = 9; // Motor control pin via transistor
9 int COLD = 5; // Another output pin if you want (example: for LED)
10
11 void setup() {
12   dht.begin();
13   Serial.begin(9600);
14   pinMode(motorPin, OUTPUT);
15   pinMode(COLD, OUTPUT);
16 }
17
18 void loop() {
19   float h = dht.readHumidity();
20   float t = dht.readTemperature();
21
22   Serial.print("Humidity: ");
23   Serial.print(h);
24   Serial.print(" %\t");
25   Serial.print("Temperature: ");
26   Serial.print(t);
27   Serial.println(" *C");
28
29   // Control Motor based on temperature
30   if (t > 25) {
31     digitalWrite(motorPin, HIGH); // Fan ON
32   } else {
33     digitalWrite(motorPin, LOW); // Fan OFF
34   }
35
36   // Control another device if needed
37   if (t < 20) {
38     digitalWrite(COLD, HIGH); // Turn on something if very cold
39   } else {
40     digitalWrite(COLD, LOW);
41   }
42
43   delay(1000); // Read every 1 second
44 }
```

02 Capteur de température et d'humidité



03 Capteur de niveau d'eau

- Capteur de niveau d'eau
- Arduino
- LED rouge
- Plaque d'essai



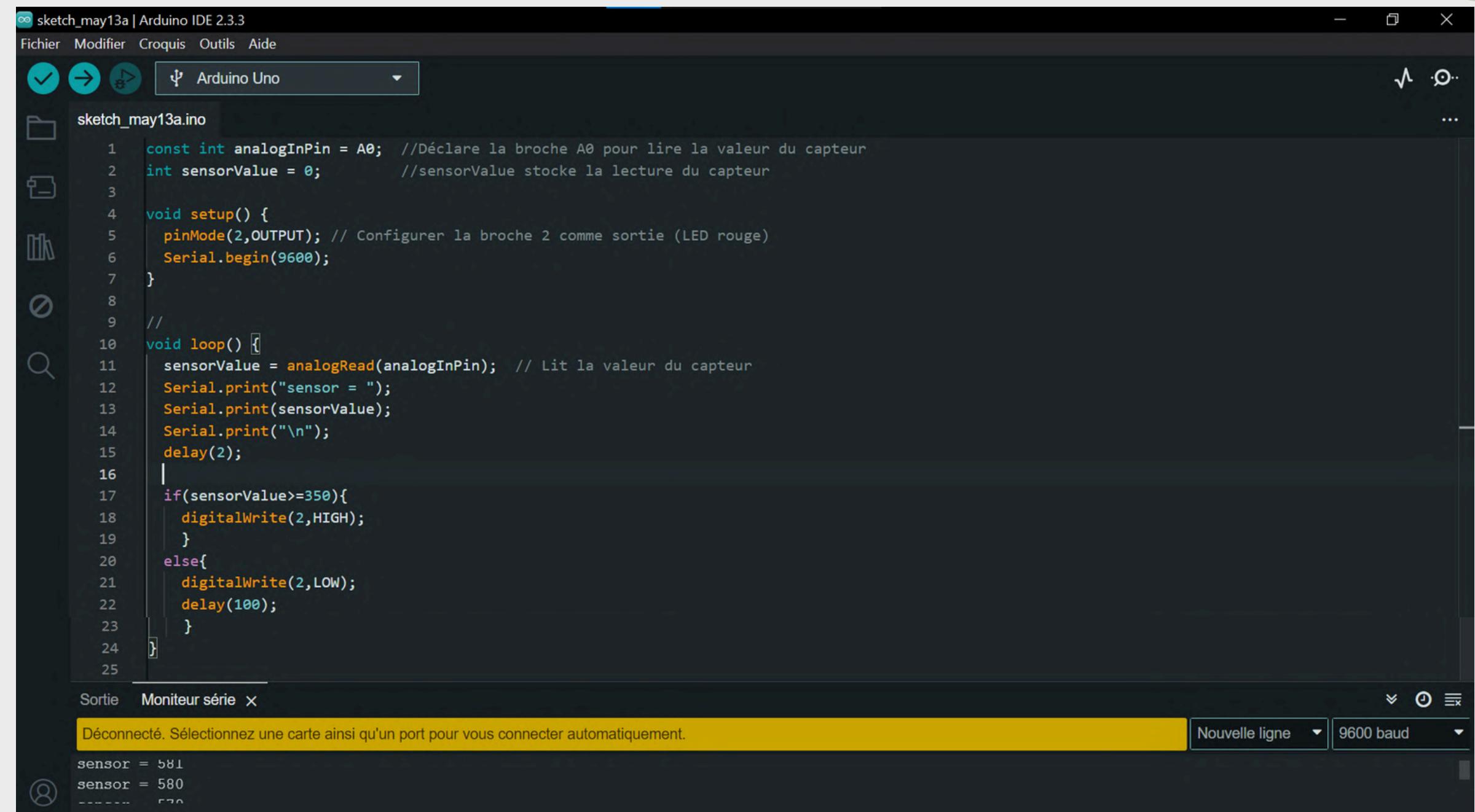
03 Capteur de niveau d'eau



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A photograph of a red water level sensor module. It has a long, thin, vertical metal strip with several parallel lines on it. The word "WaterSensor" is printed on the top part of the module.



Screenshot of the Arduino IDE 2.3.3 interface showing a sketch named "sketch_may13a.ino". The code reads analog input from pin A0, prints the value to the serial monitor, and controls a digital output pin (pin 2) based on the sensor value. The serial monitor at the bottom shows the output "sensor = 581" and "sensor = 580".

```
const int analogInPin = A0; //Déclare la broche A0 pour lire la valeur du capteur
int sensorValue = 0; //sensorValue stocke la lecture du capteur

void setup() {
  pinMode(2,OUTPUT); // Configurer la broche 2 comme sortie (LED rouge)
  Serial.begin(9600);
}

void loop() {
  sensorValue = analogRead(analogInPin); // Lit la valeur du capteur
  Serial.print("sensor = ");
  Serial.print(sensorValue);
  Serial.print("\n");
  delay(2);

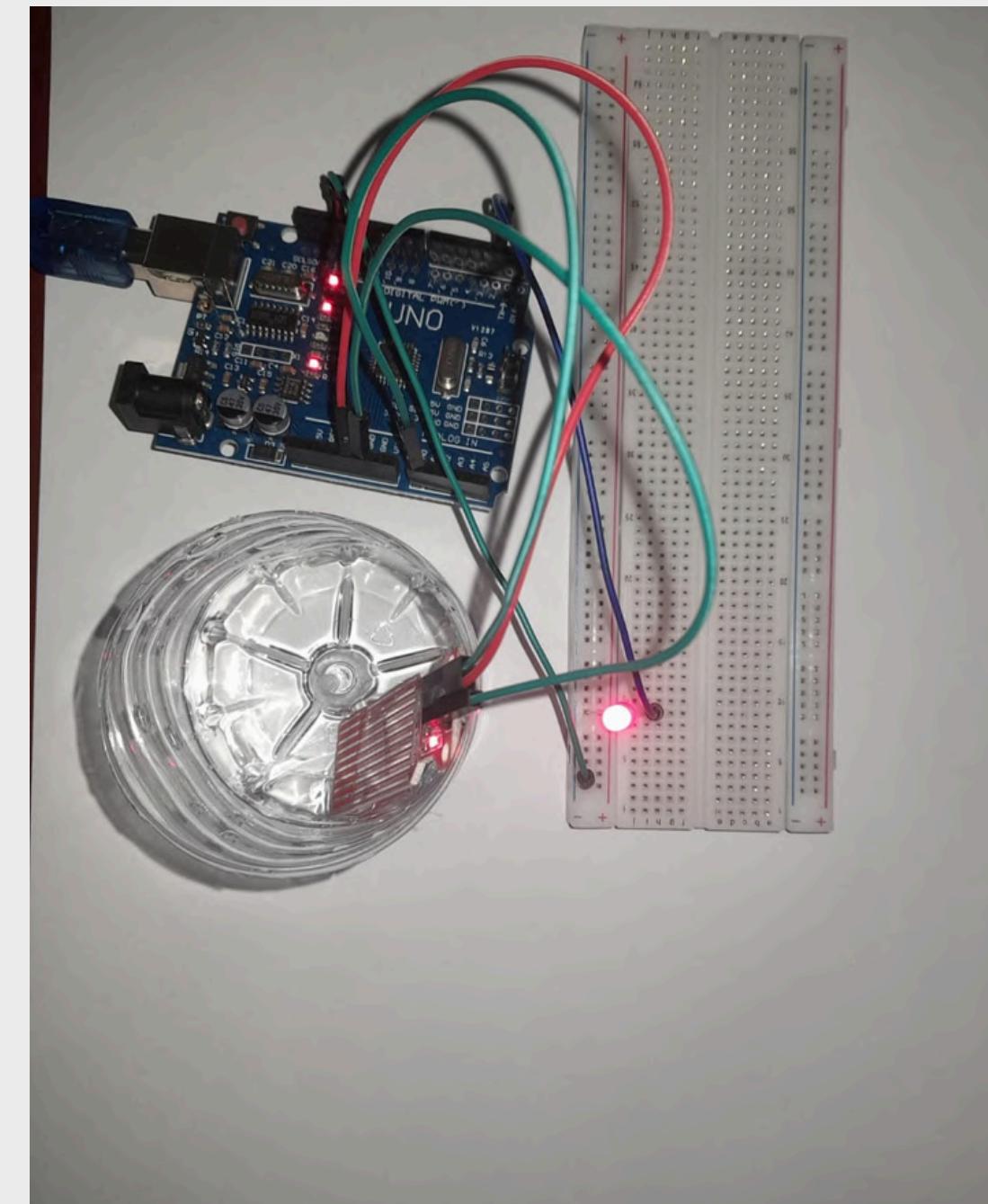
  if(sensorValue>=350){
    digitalWrite(2,HIGH);
  }
  else{
    digitalWrite(2,LOW);
    delay(100);
  }
}
```

Sortie Moniteur série

Déconnecté. Sélectionnez une carte ainsi qu'un port pour vous connecter automatiquement.

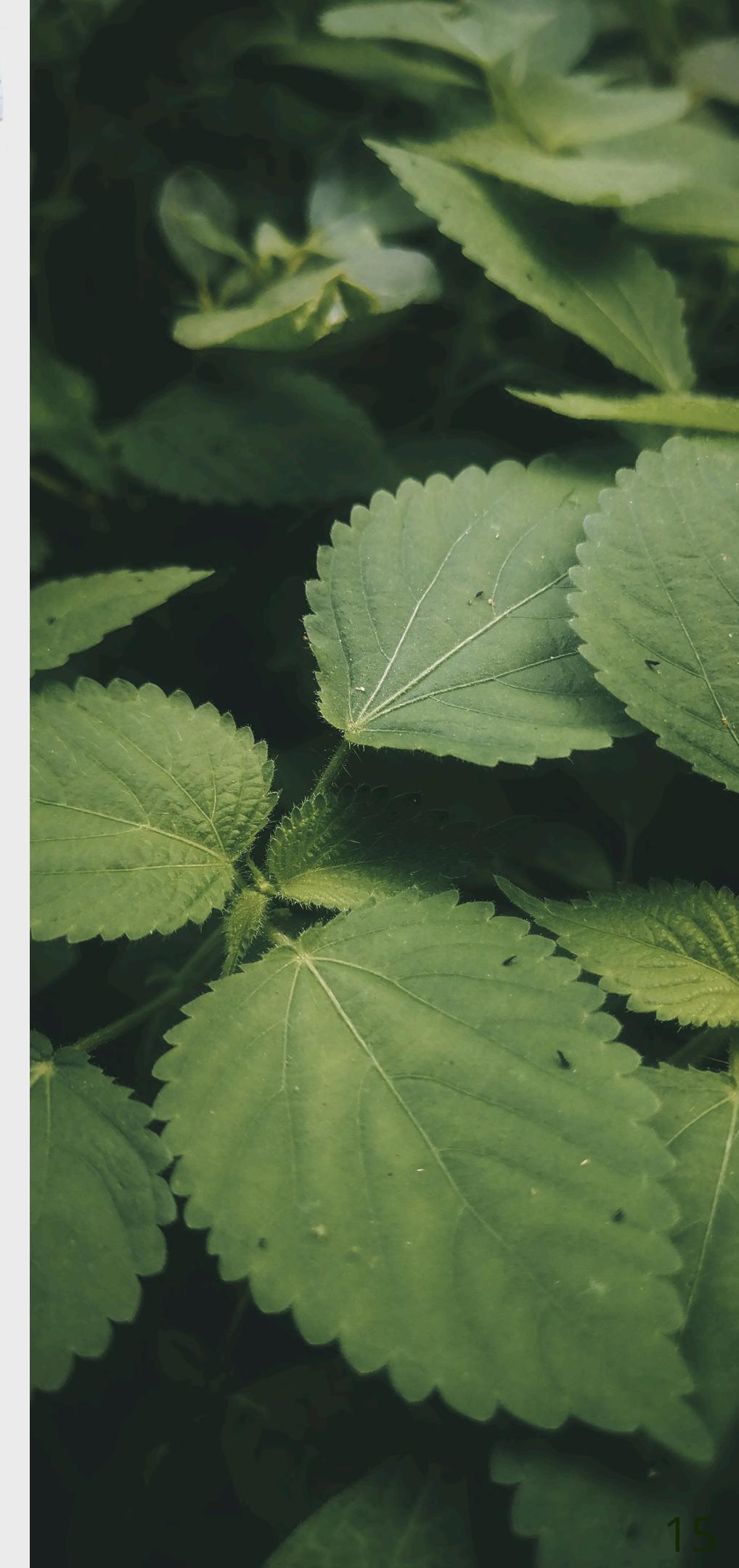
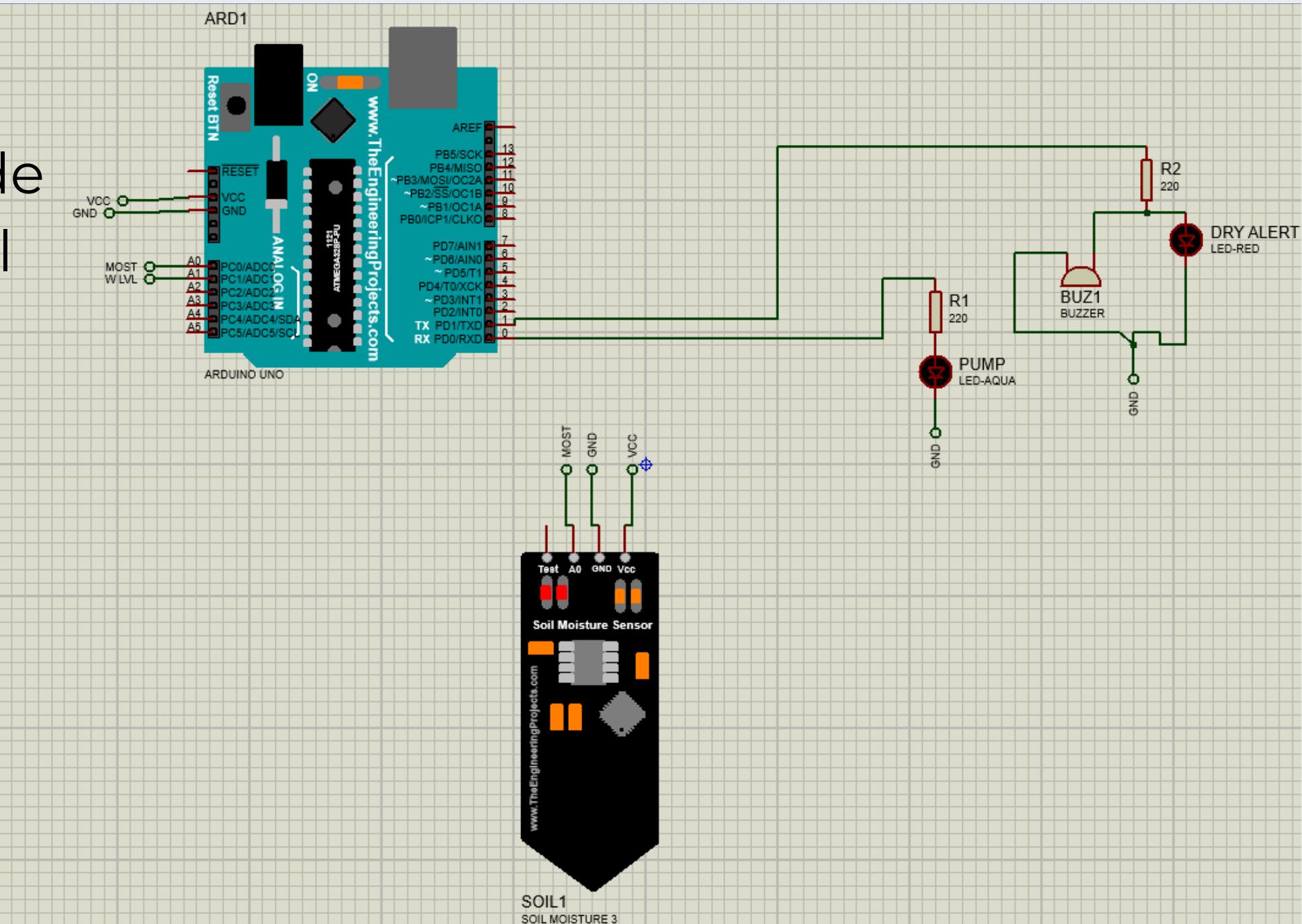
Nouvelle ligne 9600 baud

03 Capteur de niveau d'eau



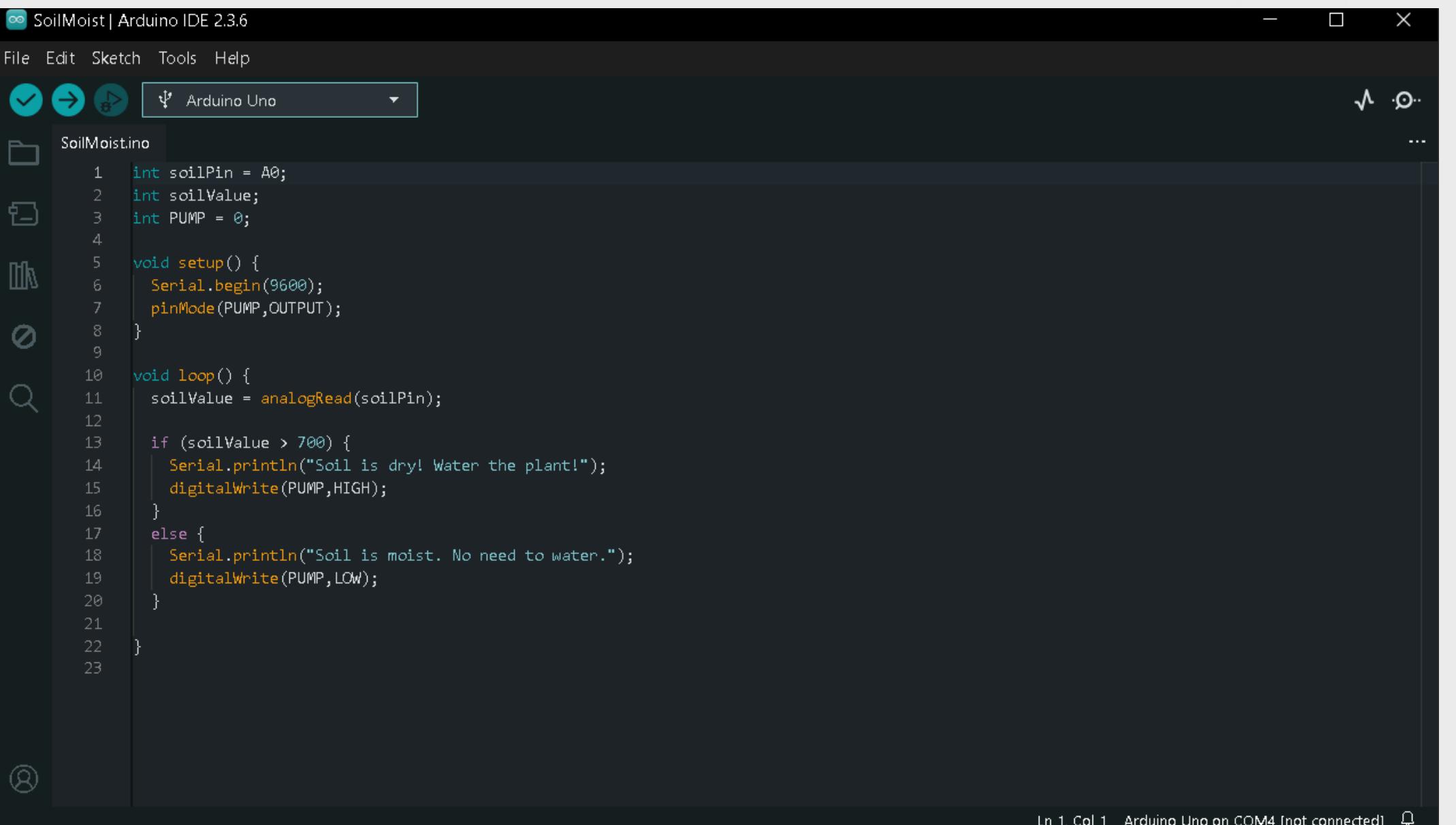
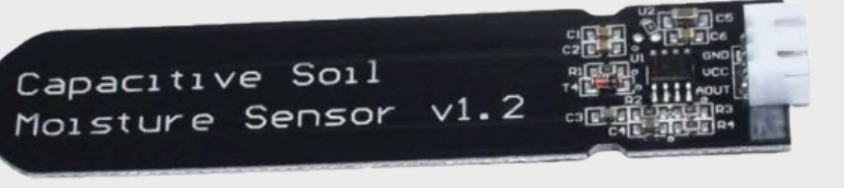
04 Capteur d'humidité du sol

- Capteur de l'humidité de sol
- Arduino
- LEDs
- Résistance
- Buzzer





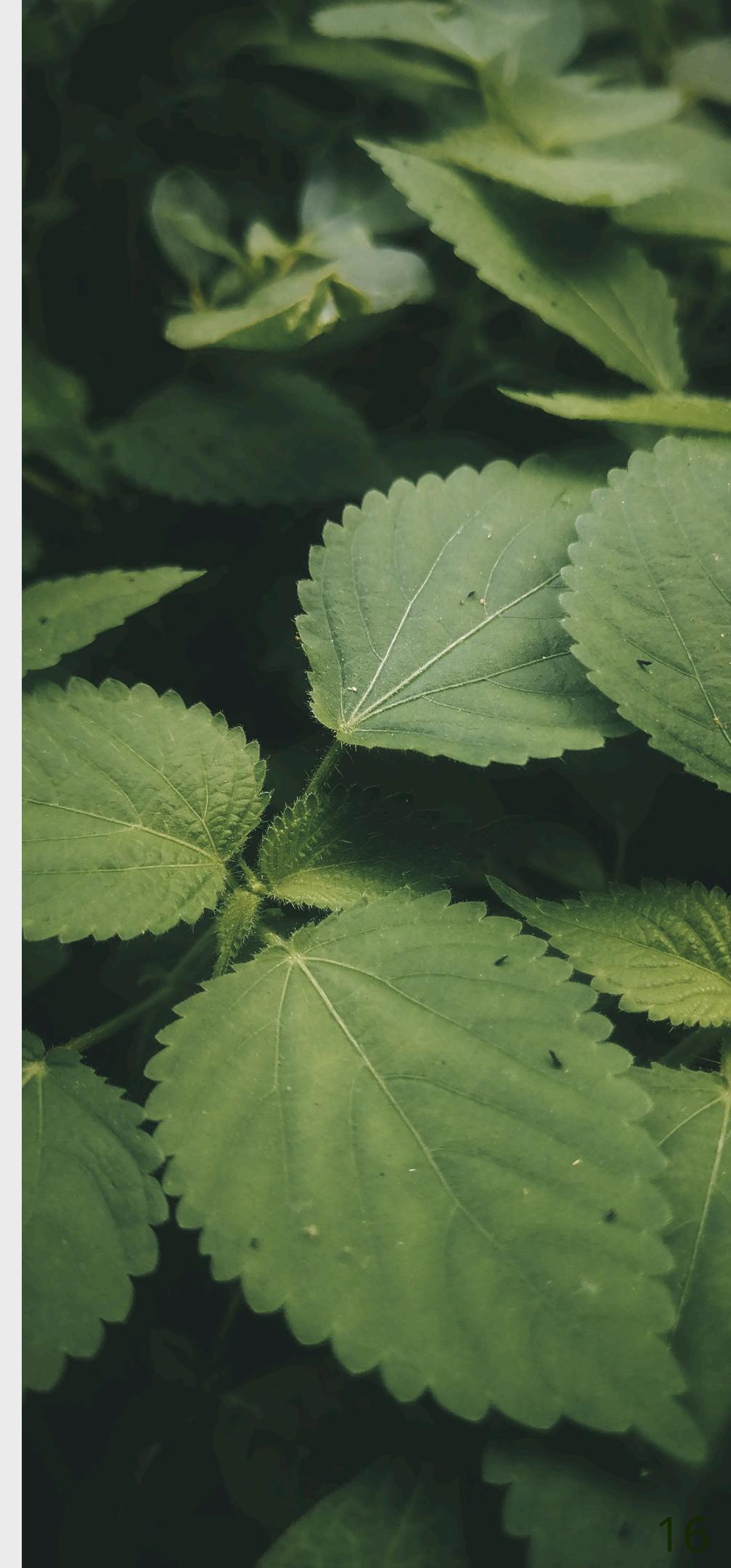
04 Capteur d'humidité du sol

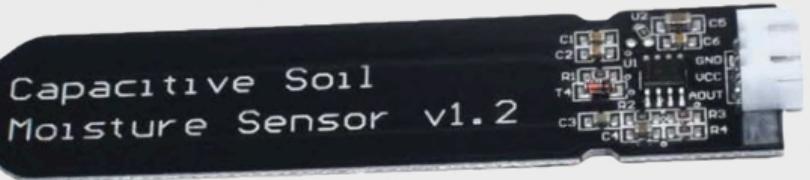


The image shows the Arduino IDE interface with the sketch 'SoilMoist.ino' open. The code reads analog input from pin A0, prints the value to the serial monitor, and controls a digital output pin (PUMP) based on the moisture level. The sketch is set to compile for an Arduino Uno.

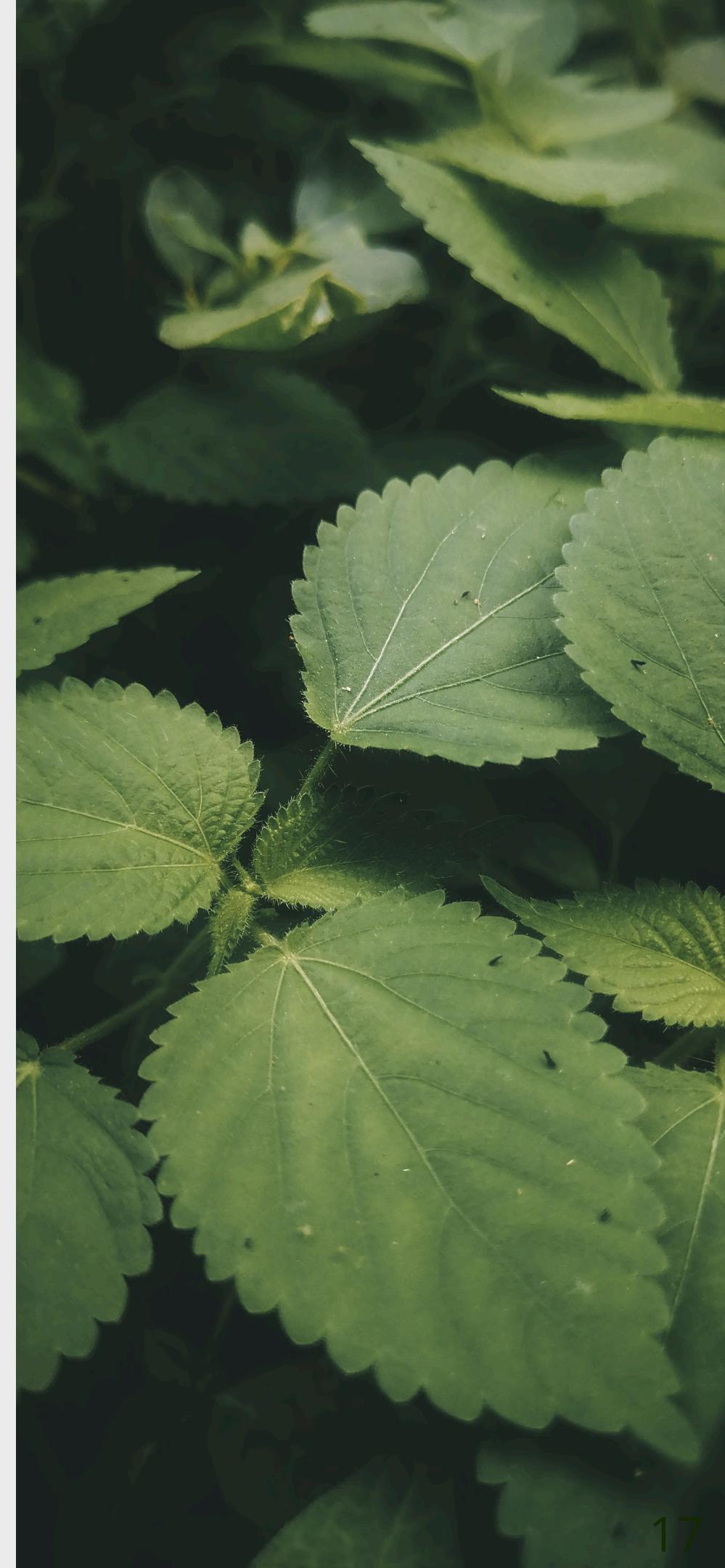
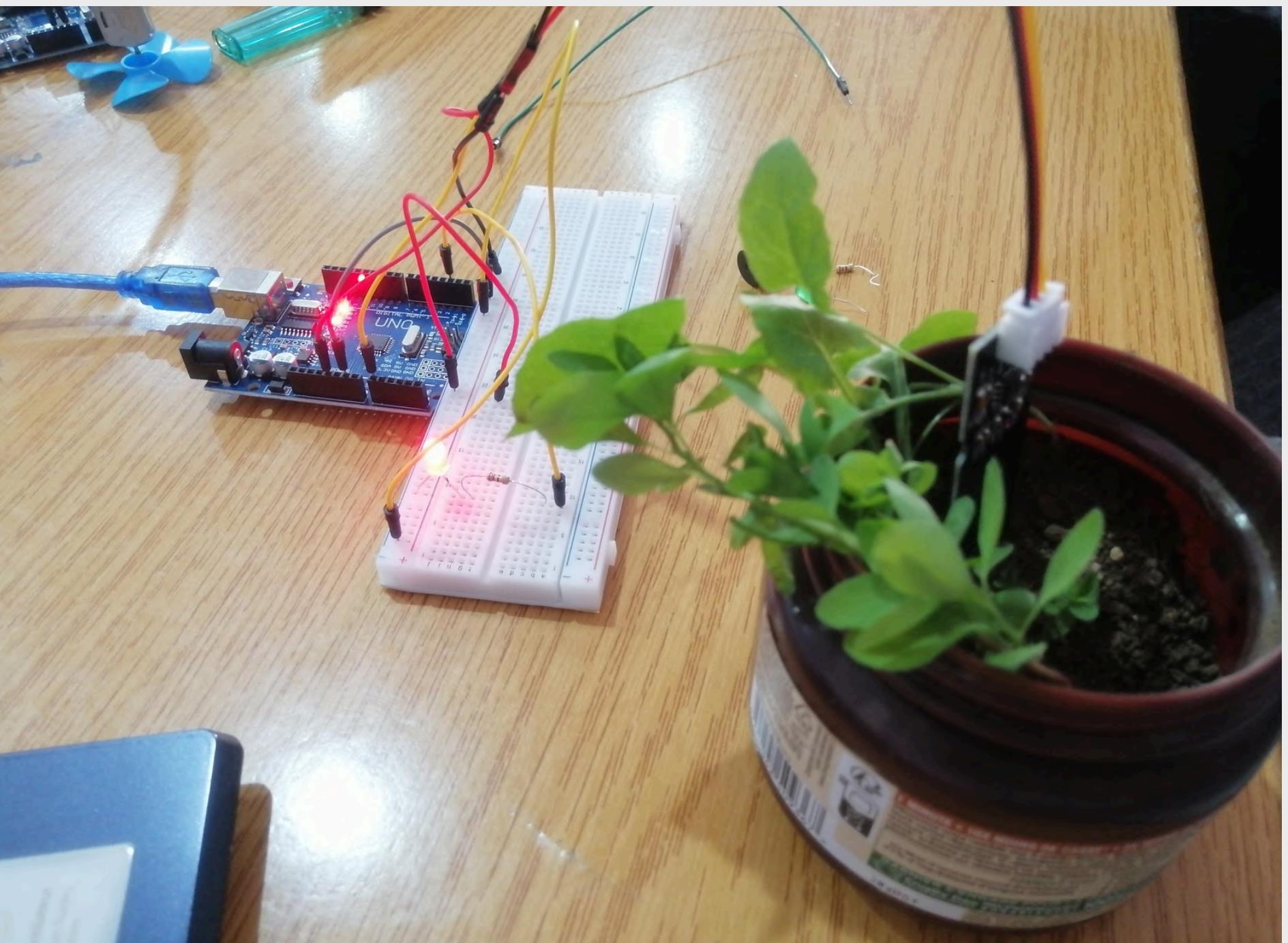
```
SoilMoist.ino
1 int soilPin = A0;
2 int soilValue;
3 int PUMP = 0;
4
5 void setup() {
6   Serial.begin(9600);
7   pinMode(PUMP,OUTPUT);
8 }
9
10 void loop() {
11   soilValue = analogRead(soilPin);
12
13   if (soilValue > 700) {
14     Serial.println("Soil is dry! Water the plant!");
15     digitalWrite(PUMP,HIGH);
16   }
17   else {
18     Serial.println("Soil is moist. No need to water.");
19     digitalWrite(PUMP,LOW);
20   }
21
22 }
```

Ln 1, Col 1 Arduino Uno on COM4 [not connected] ⚙

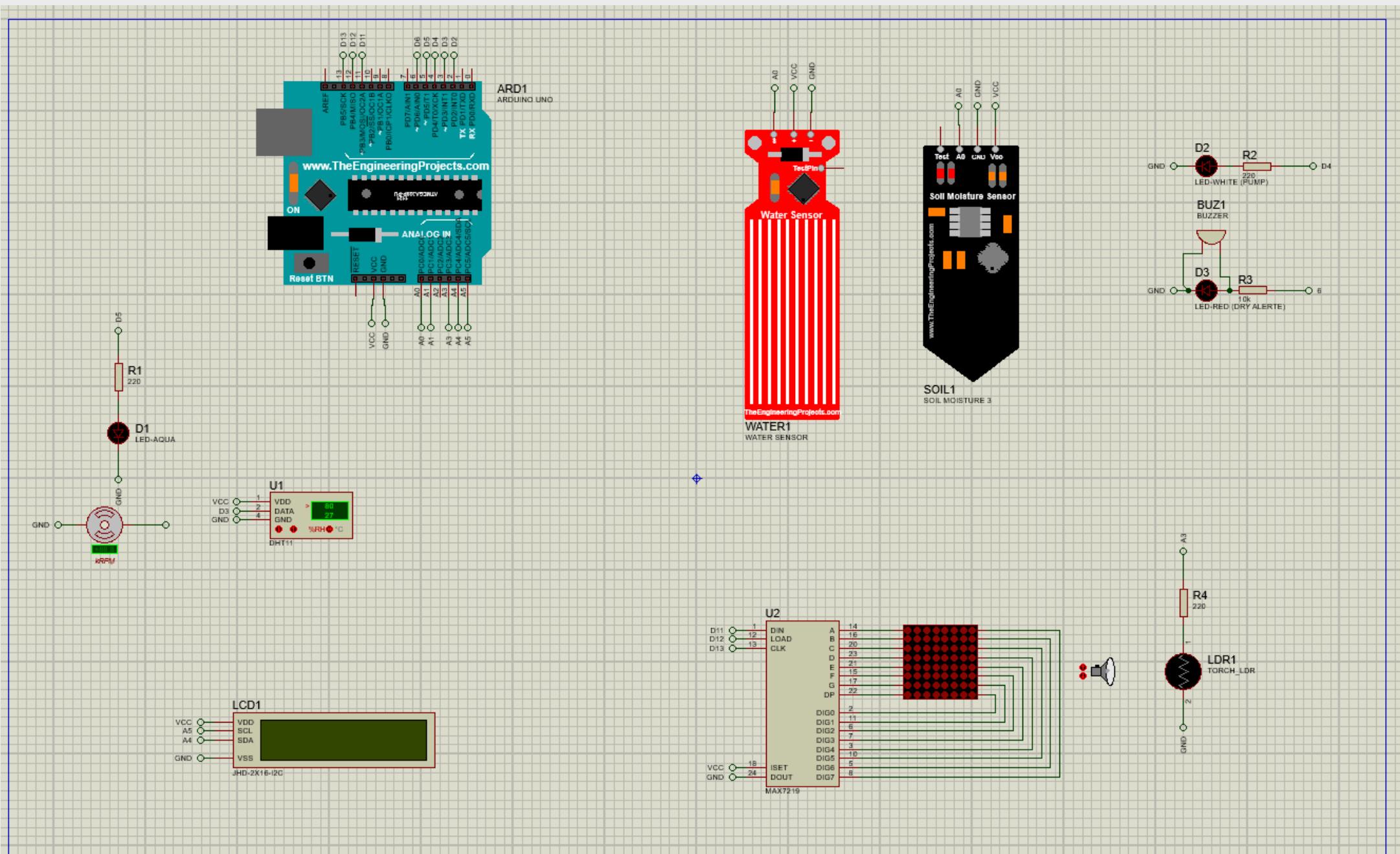




04 Capteur d'humidité du sol



05 L'ensemble du système



05 L'ensemble du système

```
SystemEntretienDePlante.ino
1 #include <Wire.h>
2 #include <LiquidCrystal_I2C.h>
3 #include "DHT.h"
4 #include <LedControl.h>
5
6 // ===== LCD Setup =====
7 LiquidCrystal_I2C lcd(0x27, 16, 2); // Adjust 0x27 if your LCD has another address
8
9 // ===== DHT11 Setup =====
10#define DHTPIN 2    // DHT11 data pin (example: D2)
11#define DHTTYPE DHT11
12 DHT dht(DHTPIN, DHTTYPE);
13
14 // ===== Moisture + Water Level Setup =====
15 int soilPin = A0;
16 int waterLevelPin = A1;
17 int soilValue;
18 int waterLevelValue;
19 int pumpPin = 4;
20 int DRYalert = 6;
21
22 // ===== Light Sensor + LED Matrix Setup =====
23 LedControl lc = LedControl(11, 13, 12, 1);
24 int LDR_PIN = A3;
25 int ldrThreshold = 500;
26
27 // ===== Fan Control =====
28 int fanPin = 3;
29 int coldLedPin = 5;
30
31 // ===== Time Counters =====
32 unsigned long lightStartTime = 0;
33 unsigned long darkStartTime = 0;
34 bool isLight = false;
35 bool isDark = false;
```

Output Serial Monitor

```
SystemEntretienDePlante.ino
36 unsigned long lightDuration = 0;
37 unsigned long darkDuration = 0;
38
39 void setup() {
40   Serial.begin(9600);
41
42   // LCD
43   lcd.init();
44   lcd.backlight();
45
46   // DHT
47   dht.begin();
48
49   // Moisture/Water Level
50   pinMode(pumpPin, OUTPUT);
51   pinMode(DRYalert, OUTPUT);
52
53   // Fan
54   pinMode(fanPin, OUTPUT);
55   pinMode(coldLedPin, OUTPUT);
56
57   // LED Matrix
58   lc.shutdown(0, false);
59   lc.setIntensity(0, 10);
60   lc.clearDisplay(0);
61
62   lcd.setCursor(0, 0);
63   lcd.print("System Starting..");
64   delay(2000);
65   lcd.clear();
66 }
67
68 void loop() {
69   // ===== Read Sensors =====
70   soilValue = analogRead(soilPin);
```

Output Serial Monitor



ARDUINO

ARDUINO

05 L'ensemble du système

```
SystemEntretienDePlante.ino
69   soilValue = analogRead(soilPin);
70   waterLevelValue = analogRead(waterLevelPin);
71   int ldrValue = analogRead(LDR_PIN);
72
73   float humidity = dht.readHumidity();
74   float temperature = dht.readTemperature();
75
76   // ===== Light/Dark Duration =====
77   Serial.println(ldrValue); // Only print LDR value
78
79   if (ldrValue < ldrThreshold) {
80     delay(3000);
81     // Turn ON ALL LEDs (all rows + all columns)
82     for (int row = 0; row < 8; row++) {
83       lc.setRow(0, row, 0b11111111); // Binary 255 = ALL LEDs in row ON
84     }
85   } else {
86     lc.clearDisplay(0); // Turn OFF ALL LEDs
87   }
88   delay(100);
89
90
91
92   // ===== Pump Control =====
93   if (soilValue > 700 && waterLevelValue > 350) {
94     digitalWrite(pumpPin, HIGH); // Water the plant
95     digitalWrite(DRYalert, LOW);
96   } else if (soilValue < 700) {
97     digitalWrite(pumpPin, LOW);
98     digitalWrite(DRYalert, LOW);
99   } else if (soilValue > 700 && waterLevelValue < 350) {
100    digitalWrite(pumpPin, LOW);
101    digitalWrite(DRYalert, HIGH);
102  }
103
104
105 // ===== Fan Control =====
```

Output Serial Monitor

```
SystemEntretienDePlante.ino
105 // ===== Fan Control =====
106 if (temperature > 25) {
107   digitalWrite(fanPin, HIGH);
108 } else {
109   digitalWrite(fanPin, LOW);
110 }
111
112 if (temperature < 20) {
113   digitalWrite(coldLedPin, HIGH);
114 } else {
115   digitalWrite(coldLedPin, LOW);
116 }
117
118 // ===== LED Matrix Control =====
119 if (ldrValue < ldrThreshold) {
120   for (int row = 0; row < 8; row++) {
121     lc.setRow(0, row, 0b11111111);
122   }
123 } else {
124   lc.clearDisplay(0);
125 }
126
127 // ===== LCD Display =====
128 lcd.clear();
129
130 lcd.setCursor(0, 0);
131 lcd.print("T:");
132 lcd.print(temperature, 1);
133 lcd.print((char)223); // Degree symbol
134 lcd.print("C H:");
135 lcd.print(humidity, 0);
136 lcd.print("%");
137
138 lcd.setCursor(0, 1);
139 lcd.print("Soil:");
140 lcd.print(map(soilValue, 1023, 0, 0, 100)); // Mapping soil moisture %
```

Output Serial Monitor



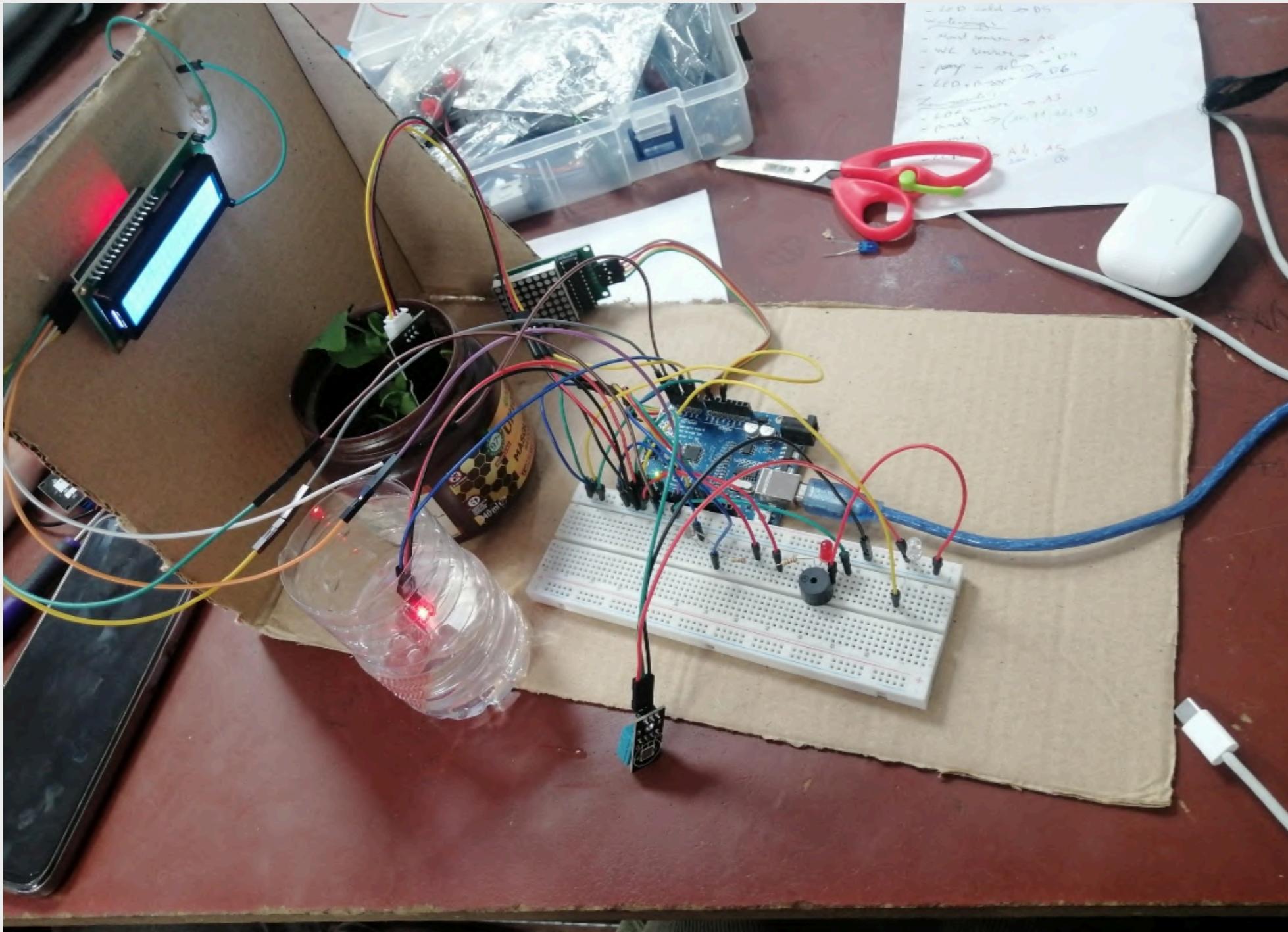
05 L'ensemble du système

```
SystemEntretienDePlante.ino
131   lcd.print("T:");
132   lcd.print(temperature, 1);
133   lcd.print((char)223); // Degree symbol
134   lcd.print("C H:");
135   lcd.print(humidity, 0);
136   lcd.print("%");
137
138   lcd.setCursor(0, 1);
139   lcd.print("Soil:");
140   lcd.print(map(soilValue, 1023, 0, 0, 100)); // Mapping soil moisture %
141
142   delay(2000);
143
144   lcd.clear();
145   lcd.setCursor(0, 0);
146   if (isLight) {
147     lcd.print("Light ");
148     lcd.print(lightDuration);
149     lcd.print("s");
150   } else {
151     lcd.print("Dark ");
152     lcd.print(darkDuration);
153     lcd.print("s");
154   }
155
156   lcd.setCursor(0, 1);
157   if (soilValue > 700 && waterLevelValue <= 350) {
158     lcd.print("REFILL RESERVOIR");
159   } else {
160     lcd.print("RESERVOIR FULL");
161   }
162
163   delay(2000);
164 }
165
```

Output Serial Monitor



05 L'ensemble du système





Merci pour
votre attention

2025

