



Systeme d'entretien d'une plante

Présentation Projet

Présenté par :

- NID MANSOUR Chaima
- MTAHTAH Wissal
- ZOUBAI Douha

Encadré par :

- Mr. Mohamed Chouiekh
- 

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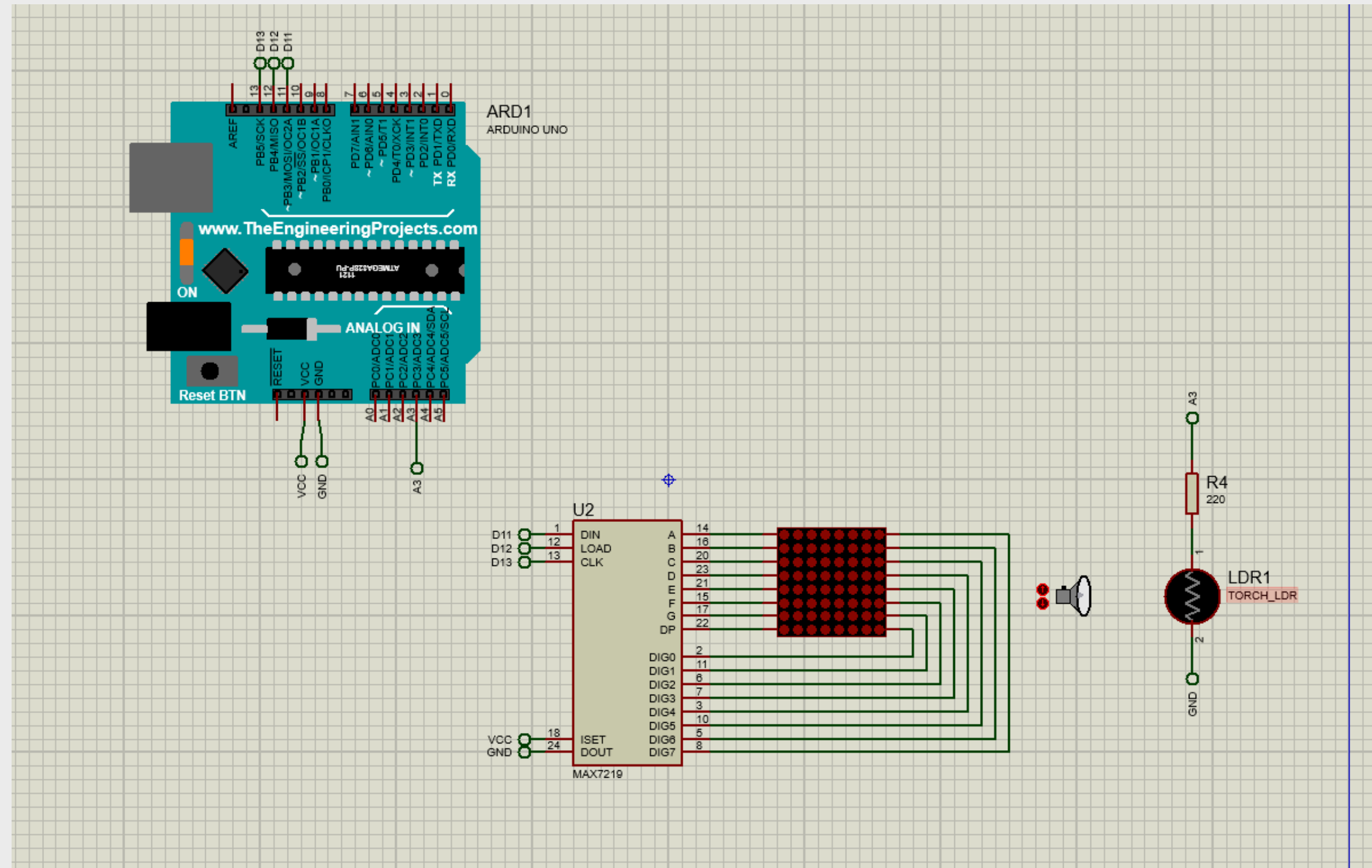
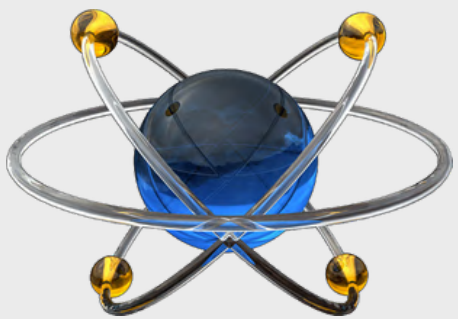
PLAN

- 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

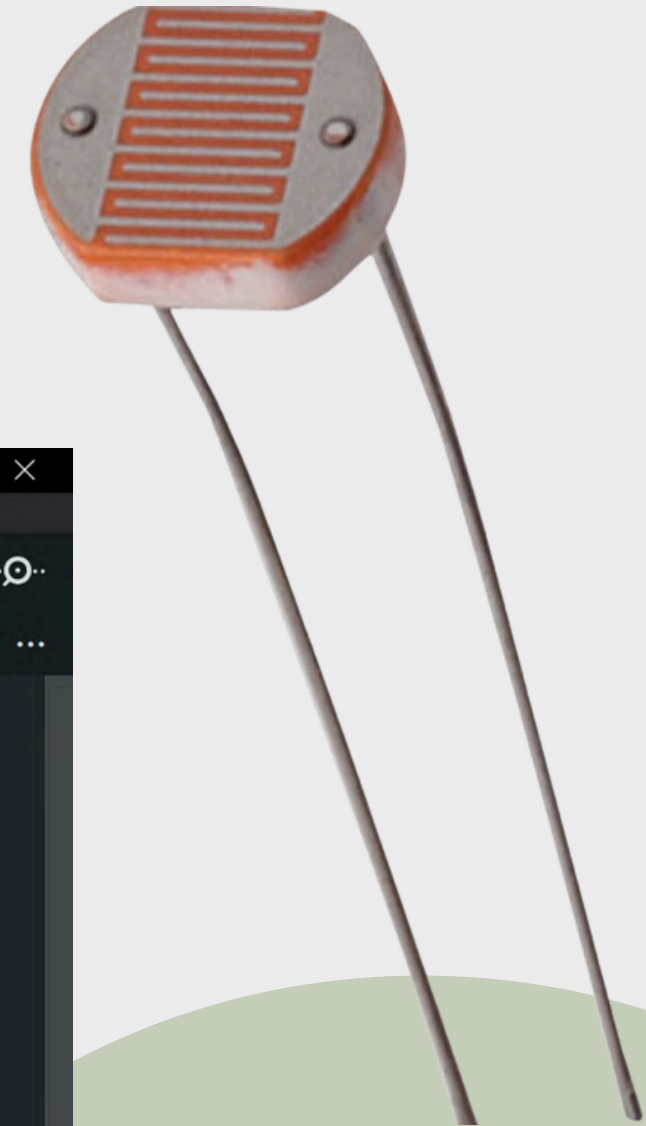


01 Capteur de Lumière

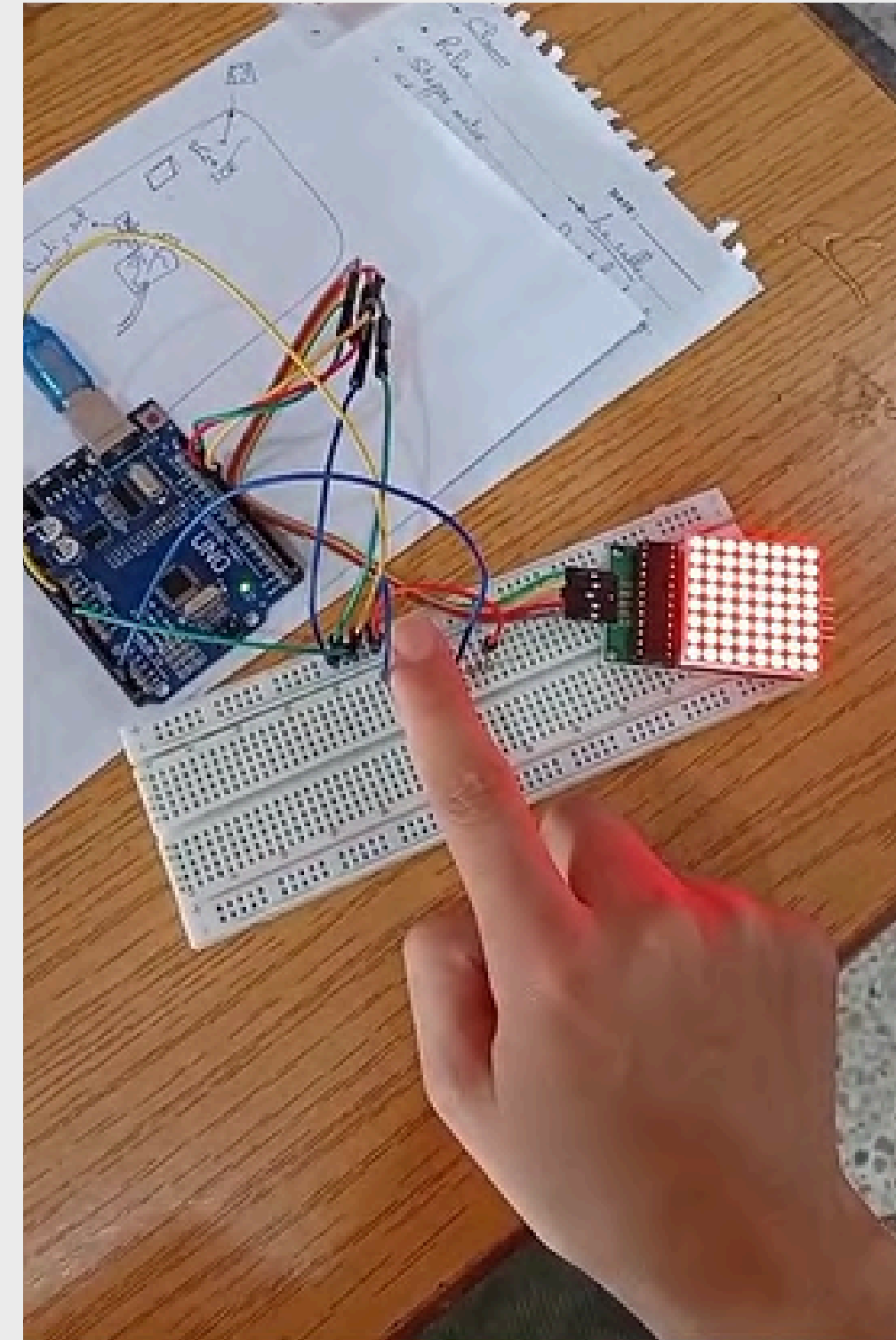
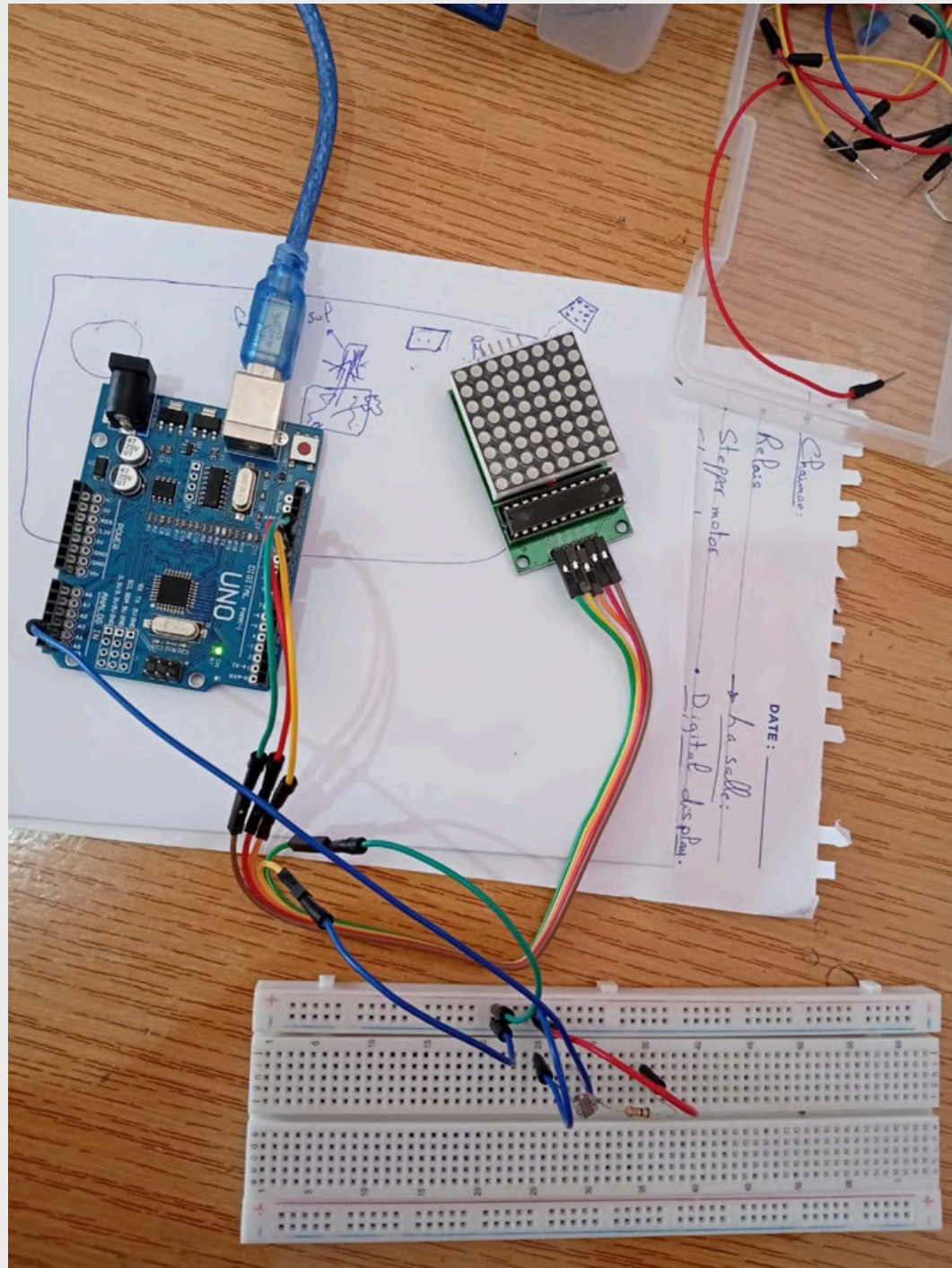


```
sketch_may13a | Arduino IDE 2.3.3
Fichier Modifier Croquis Outils Aide

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 }
```



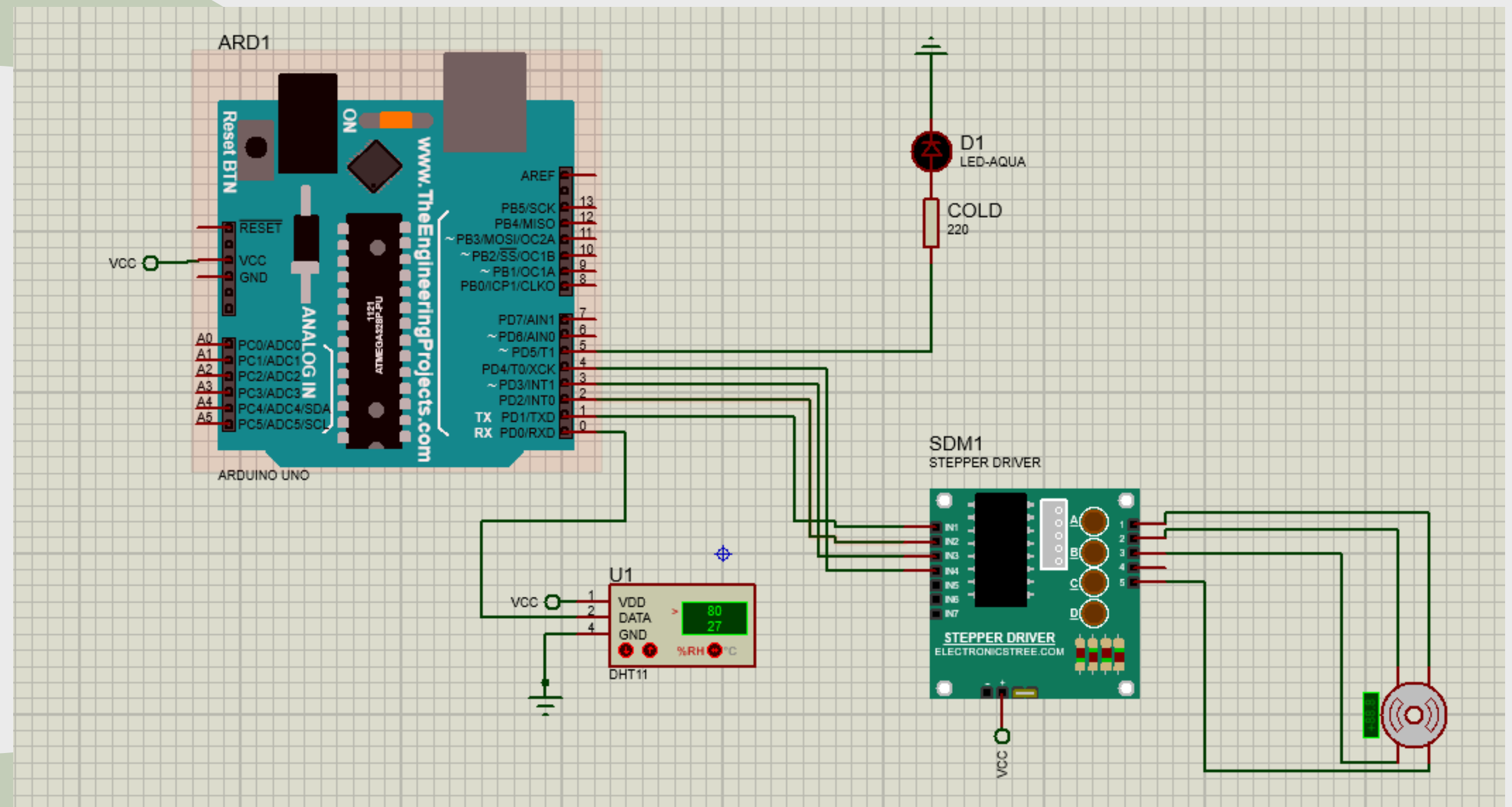
01 Capteur de Lumière



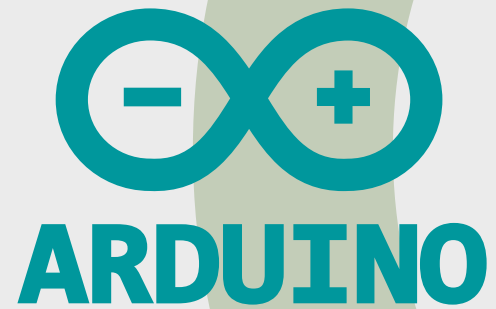
02 Capteur de température et d'humidité



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

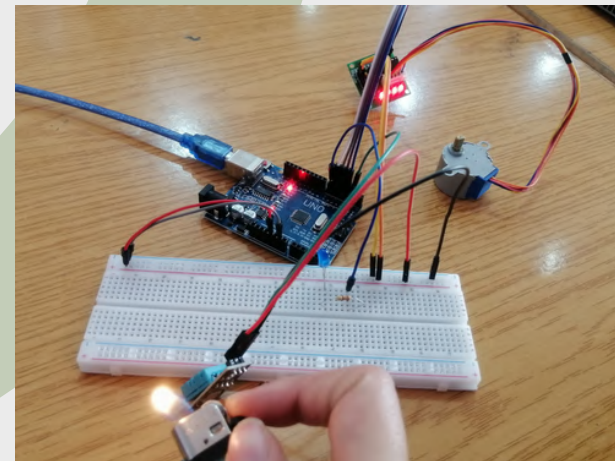
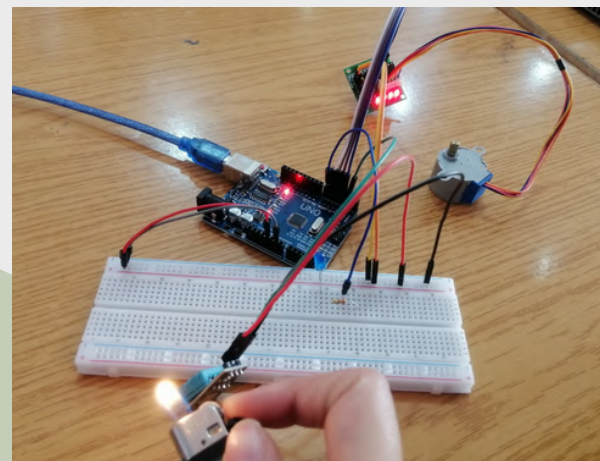
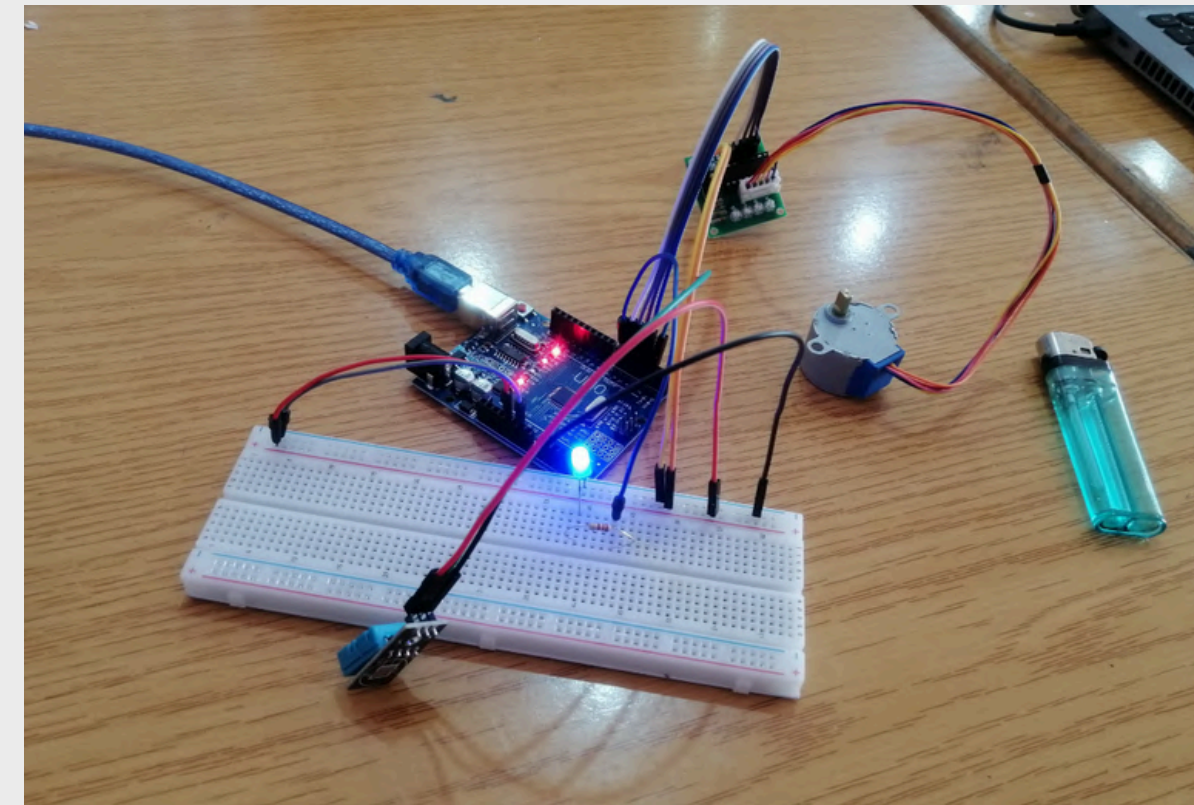
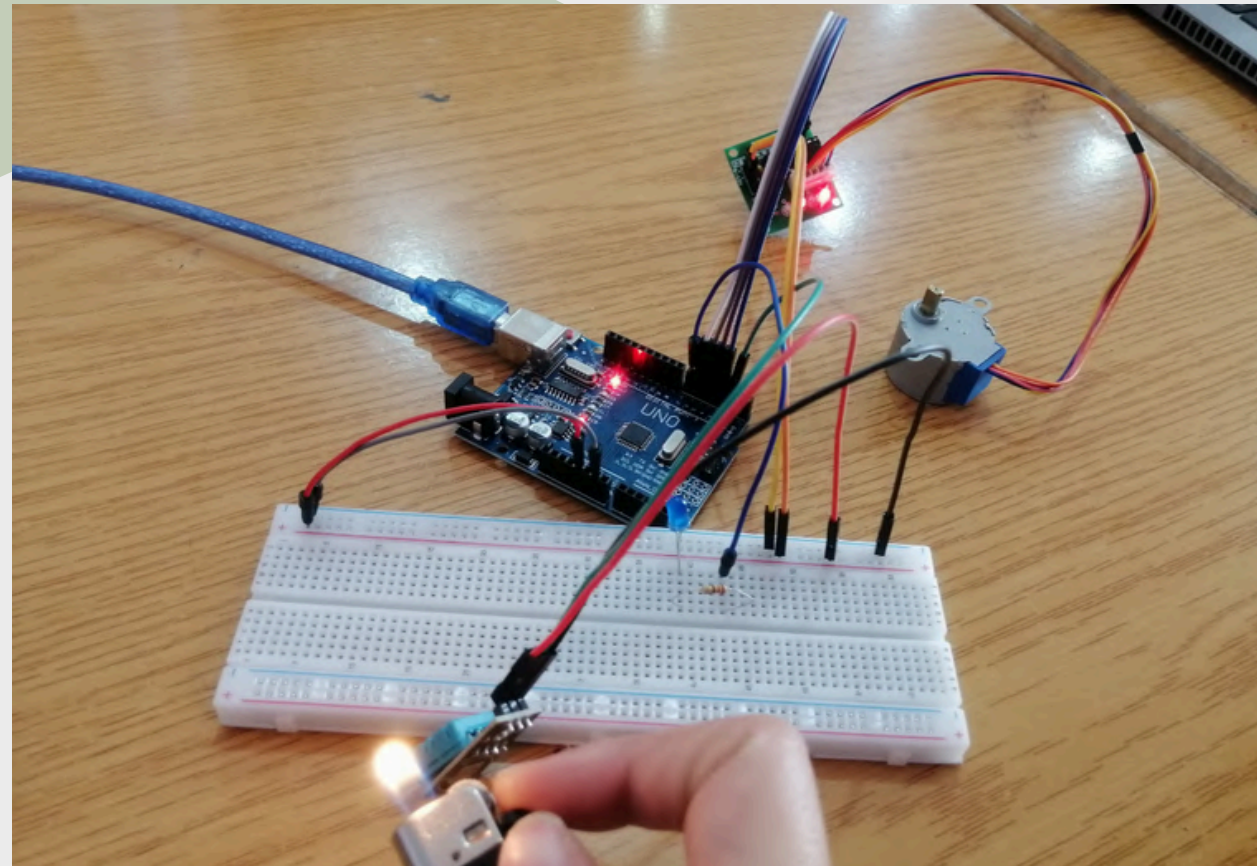


02 Capteur de température et d'humidité



```
TemperatureHumidity | Arduino IDE 2.3.6
File Edit Sketch Tools Help
Arduino Uno
SEARCH
> Search Aa _ab_* 🔍 ...
TemperatureHumidity.ino
1 //Biblios
2 #include "DHT.h"
3 #include <Stepper.h>
4
5 //PINS
6 DHT dht(0,DHT11);
7 const int stepsPerRevolution = 2048;
8 Stepper myStepper(stepsPerRevolution, 1, 2, 3, 4);
9 int COLD = 5;
10
11 void setup() {
12   // put your setup code here, to run once:
13   dht.begin();
14   Serial.begin(9600);
15   myStepper.setSpeed(11);
16   pinMode(COLD,OUTPUT);
17 }
18
19 void loop() {
20   // put your main code here, to run repeatedly:
21   float h = dht.readHumidity();
22   float t = dht.readTemperature();
23
24   while (t>10){
25     myStepper.step(1);
26   }
27   if (t<20){
28     digitalWrite(COLD,HIGH);
29   }
30   else {
31     digitalWrite(COLD,LOW);
32   }
33
34 }
```

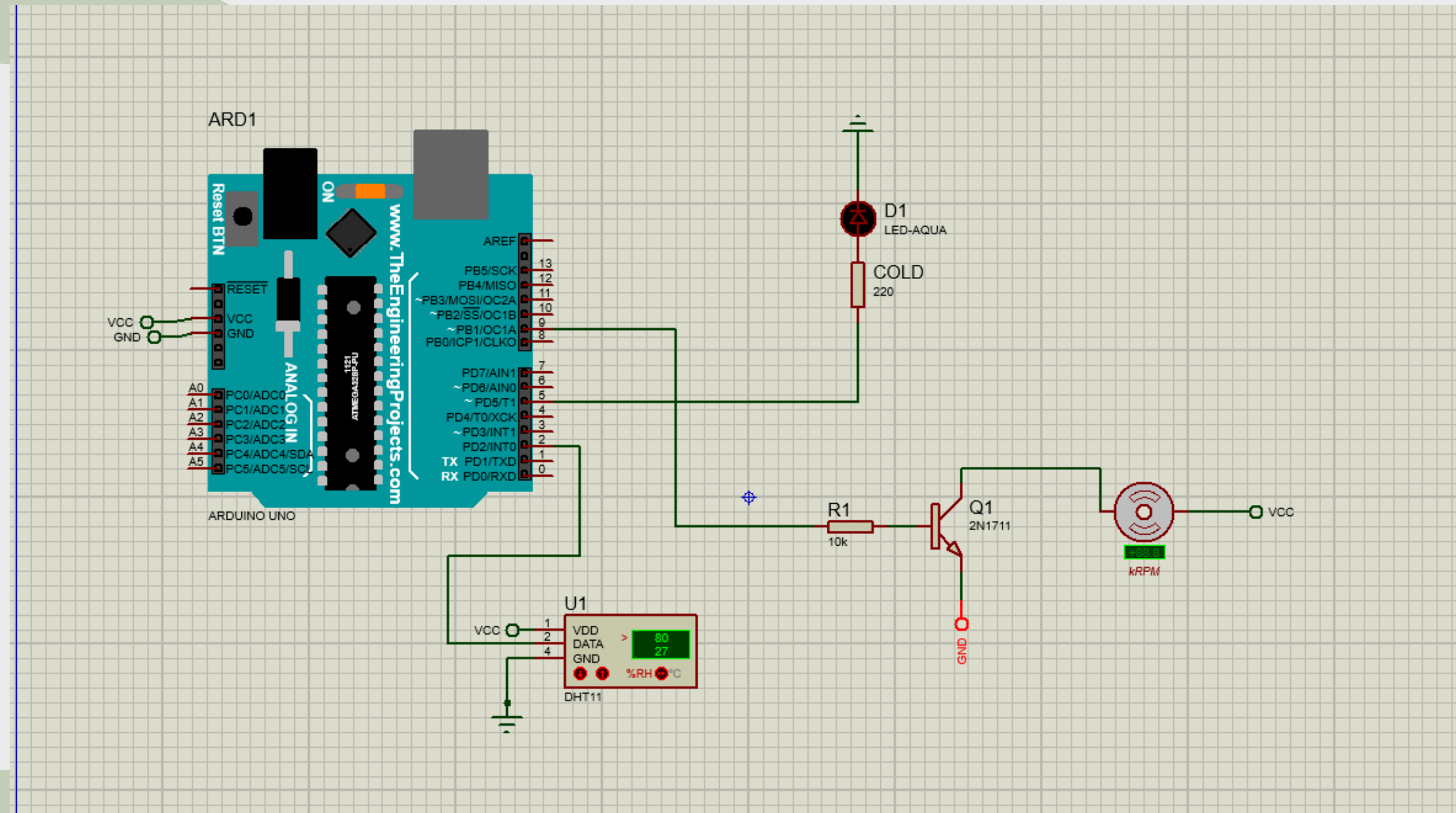
02 Capteur de température et d'humidité



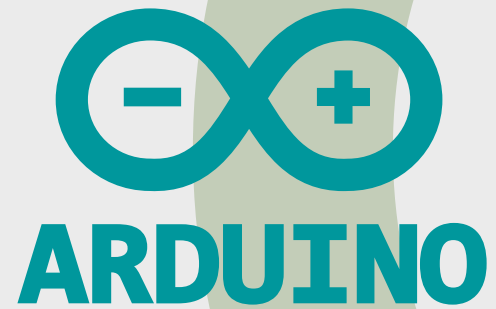
02 Capteur de température et d'humidité



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

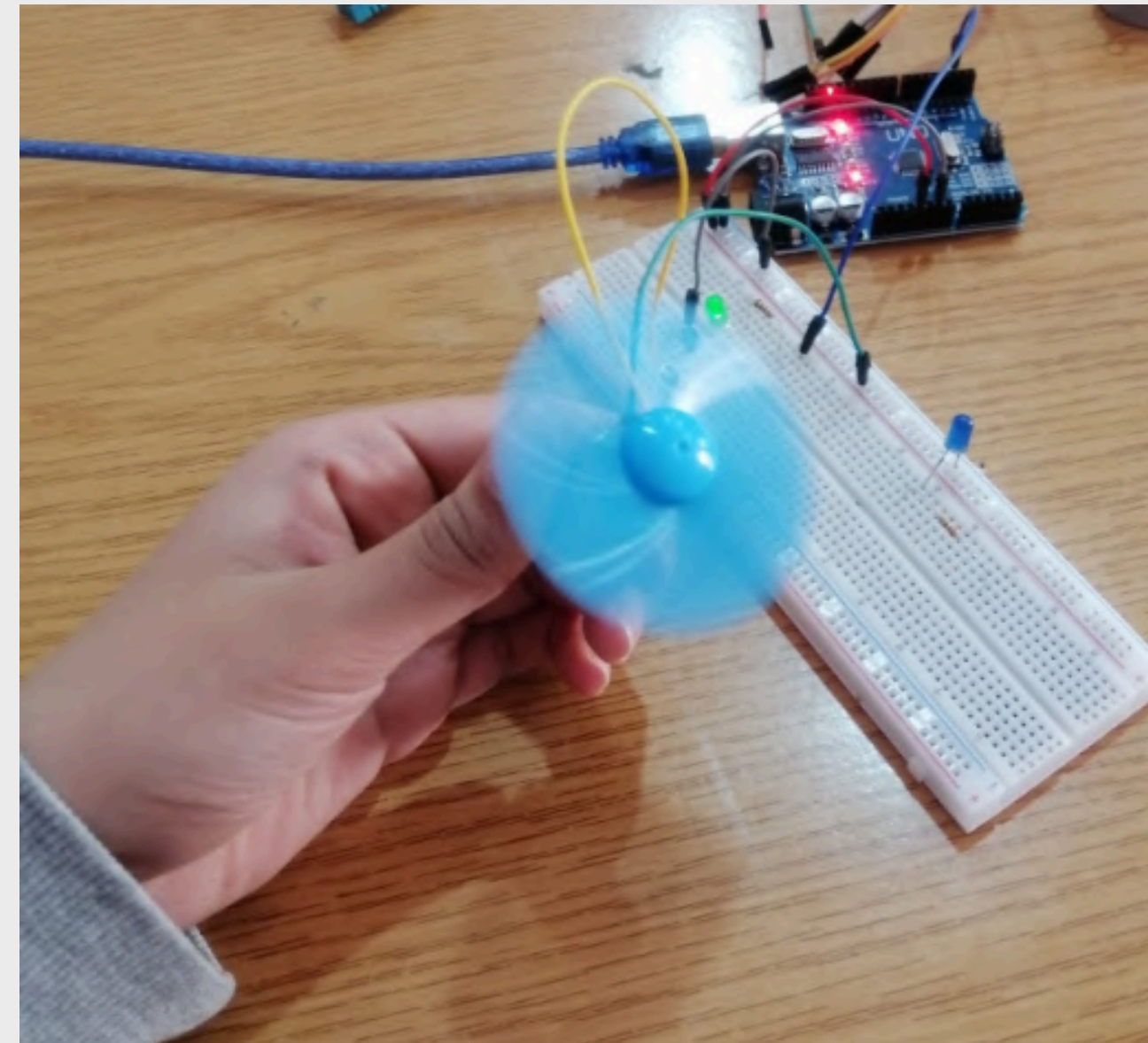
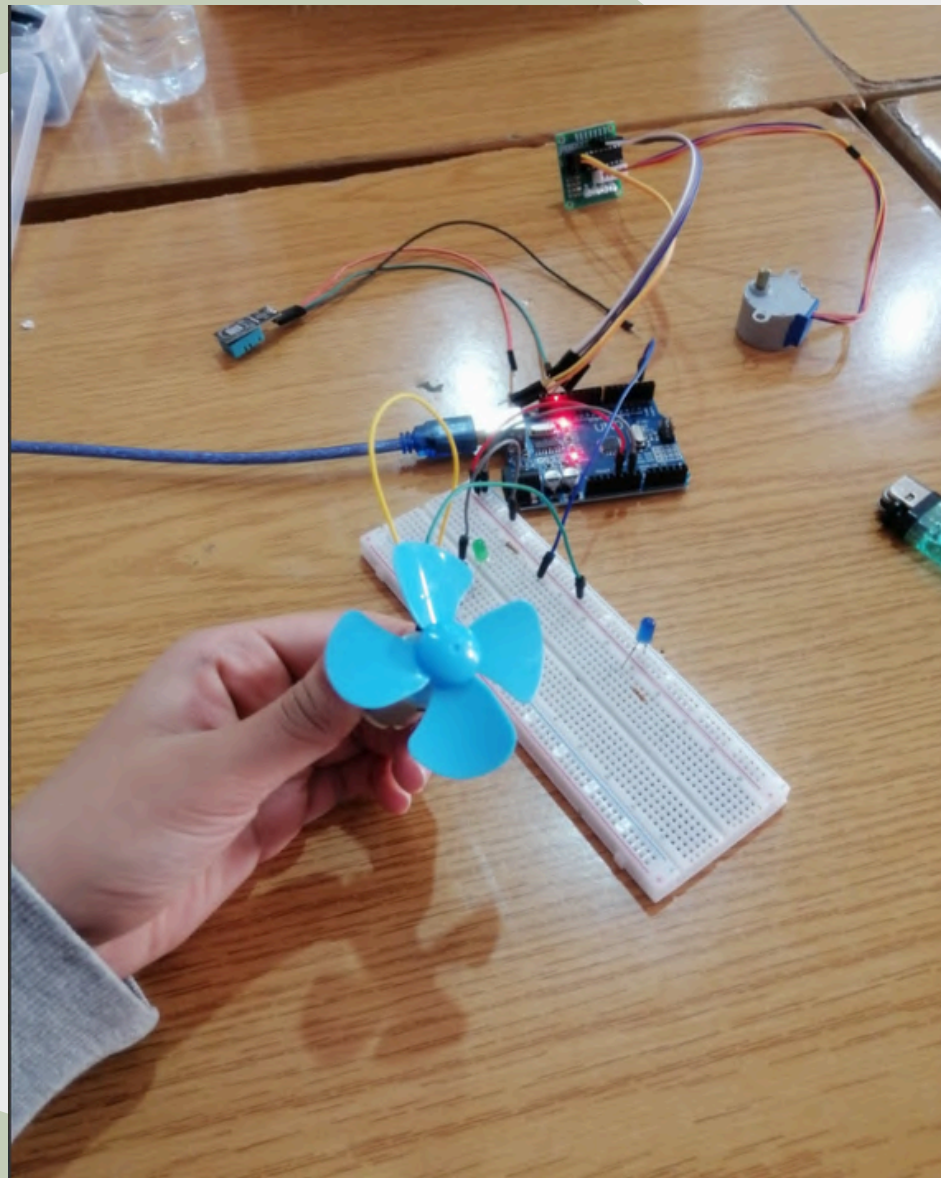


02 Capteur de température et d'humidité



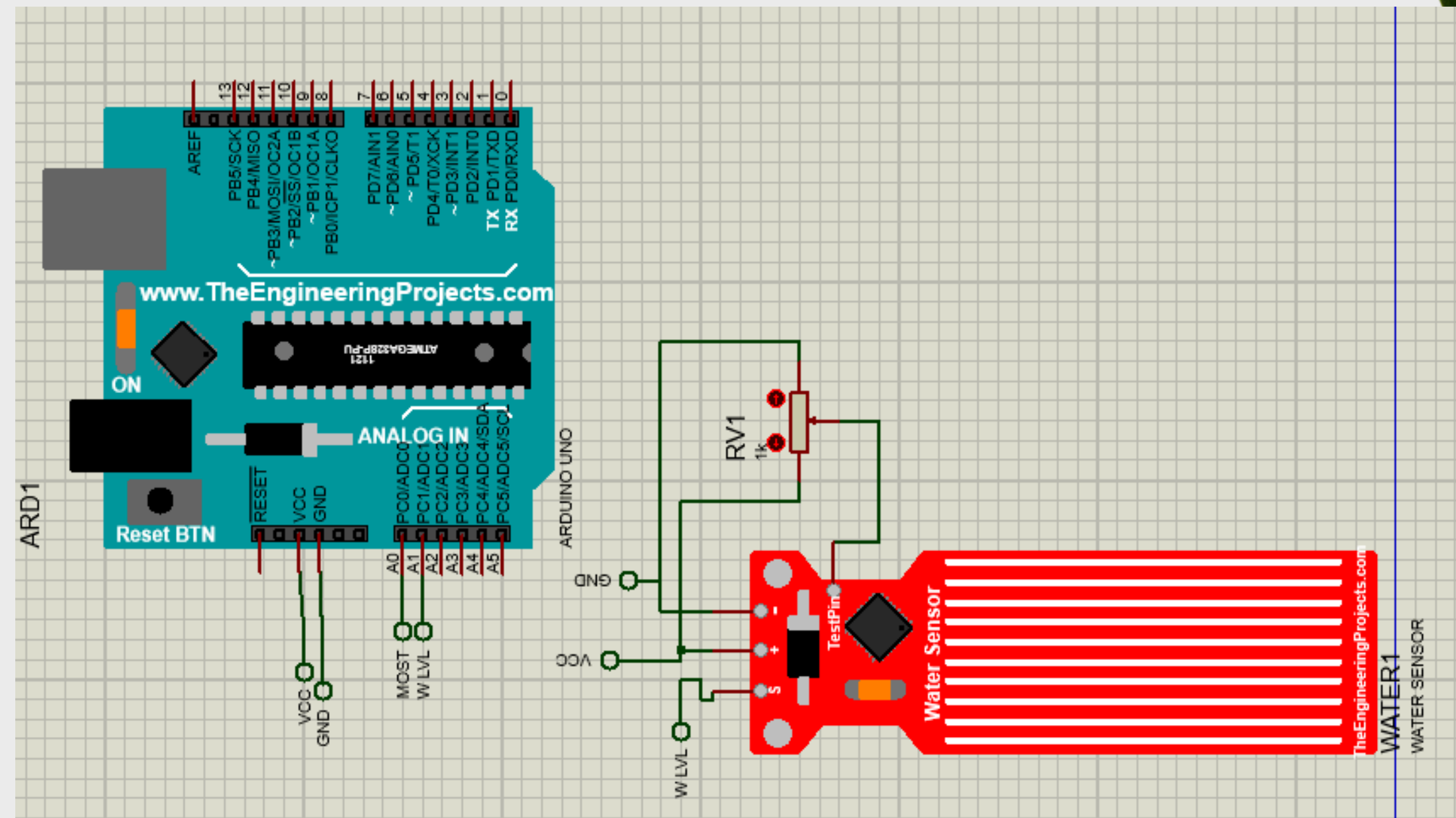
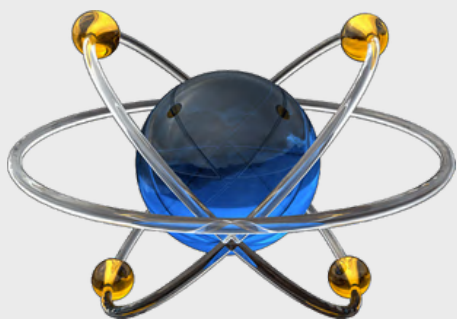
```
TemperatureHumidityDCM | Arduino IDE 2.3.6
File Edit Sketch Tools Help
[Checkmark] [Next] [Previous] [USB] Arduino Uno
TemperatureHumidityDCM.ino
1 #include "DHT.h"
2
3 #define DHTPIN 2 // DHT11 connected to digital pin 2
4 #define DHTTYPE DHT11
5
6 DHT dht(DHTPIN, DHTTYPE);
7
8 int motorPin = 9; // 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(" %\n");
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



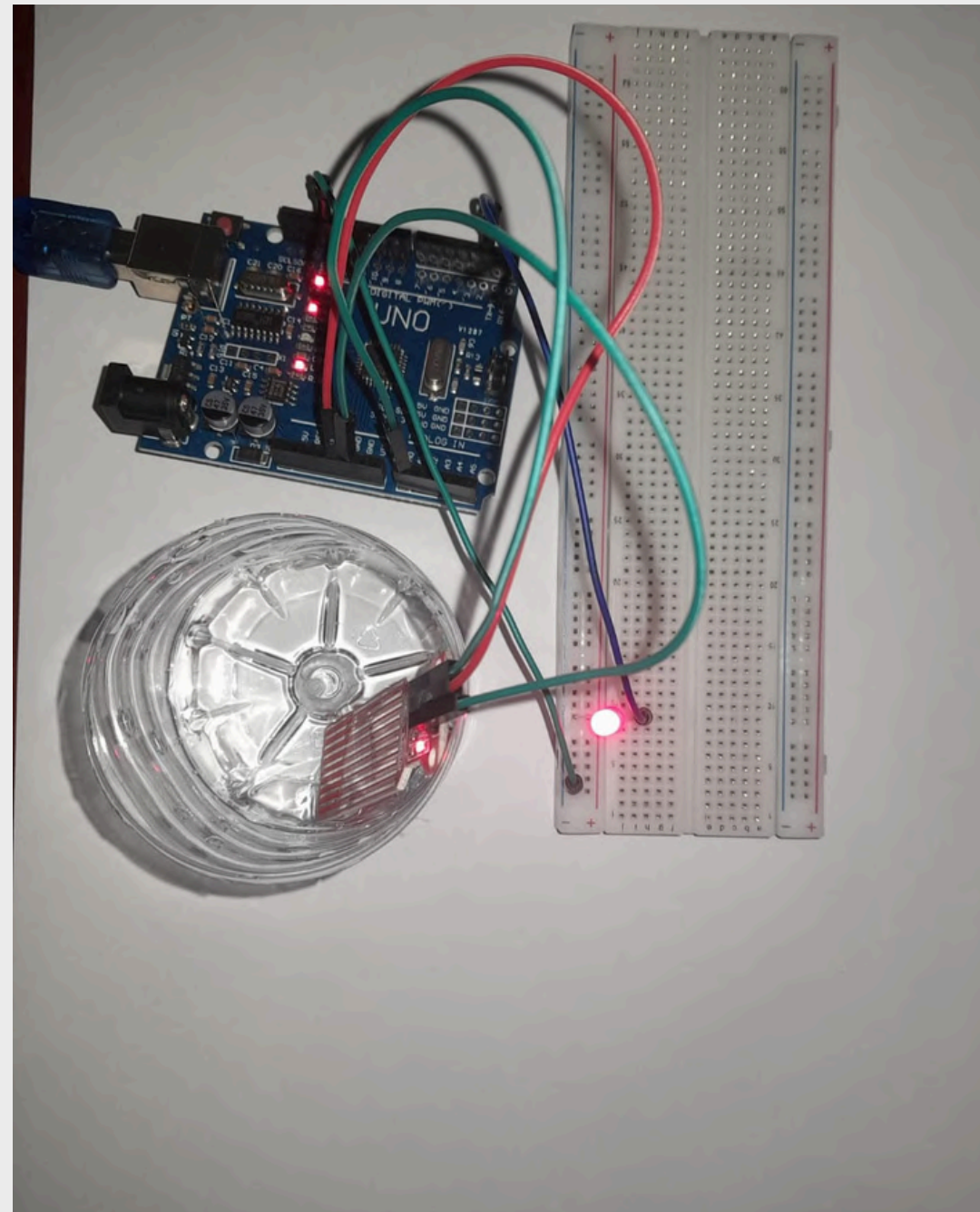
03 Capteur de niveau d'eau



```
sketch_may13a | Arduino IDE 2.3.3
Fichier Modifier Croquis Outils Aide
[Check] [Run] [Upload] [USB] Arduino Uno
sketch_may13a.ino
1  const int analogInPin = A0; //Déclare la broche A0 pour lire la valeur du capteur
2  int sensorValue = 0;        //sensorValue stocke la lecture du capteur
3
4  void setup() {
5      pinMode(2,OUTPUT); // Configurer la broche 2 comme sortie (LED rouge)
6      Serial.begin(9600);
7  }
8
9  //
10 void loop() {
11     sensorValue = analogRead(analogInPin); // Lit la valeur du capteur
12     Serial.print("sensor = ");
13     Serial.print(sensorValue);
14     Serial.print("\n");
15     delay(2);
16
17     if(sensorValue>=350){
18         digitalWrite(2,HIGH);
19     }
20     else{
21         digitalWrite(2,LOW);
22         delay(100);
23     }
24 }
25

Sortie  Moniteur série x
Déconnecté. Sélectionnez une carte ainsi qu'un port pour vous connecter automatiquement.
Nouvelle ligne 9600 baud
sensor = 581
sensor = 580
----- 570
```

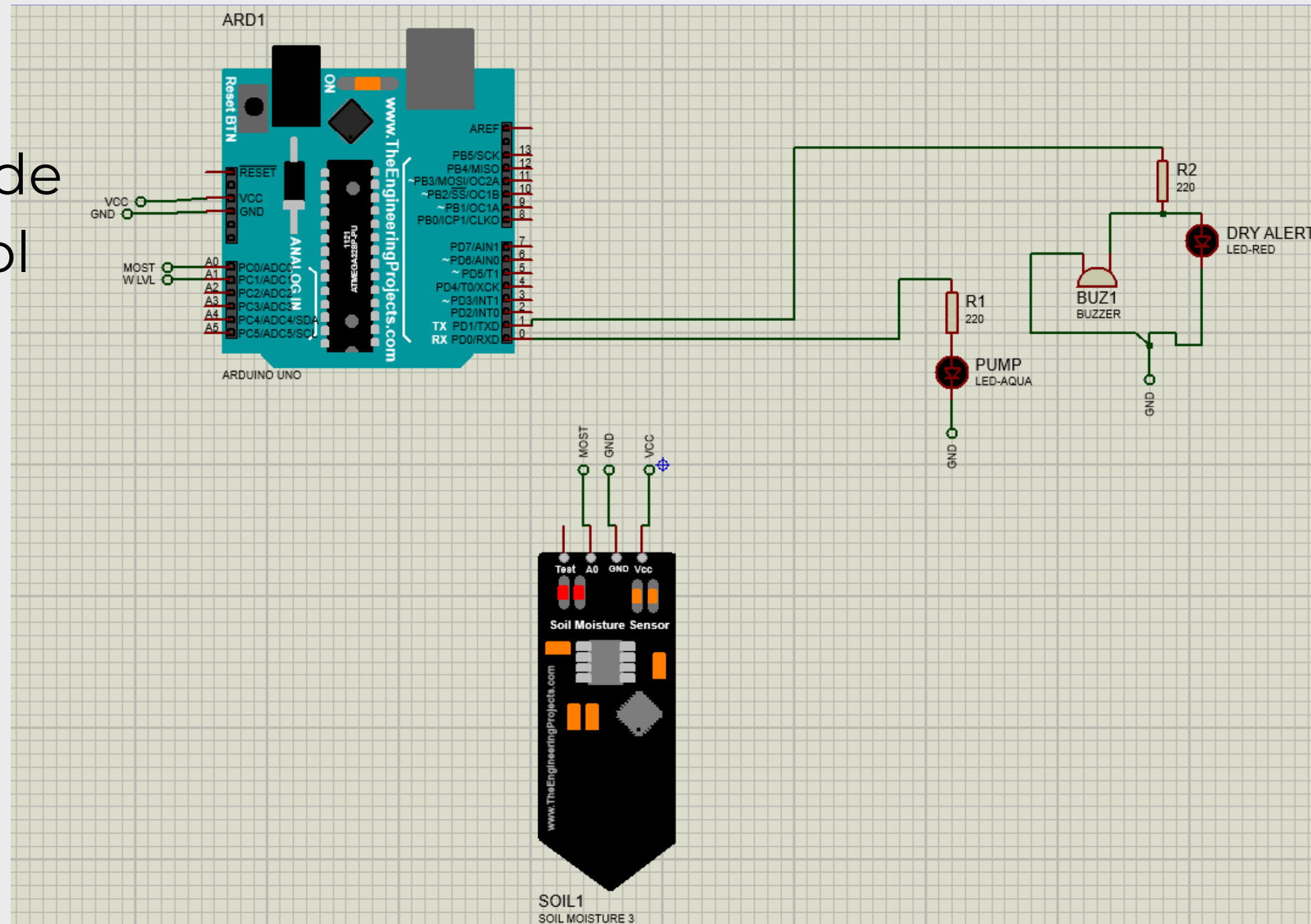
03 Capteur de niveau d'eau



04 Capteur d'humidité du sol



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



04 Capteur d'humidité du sol

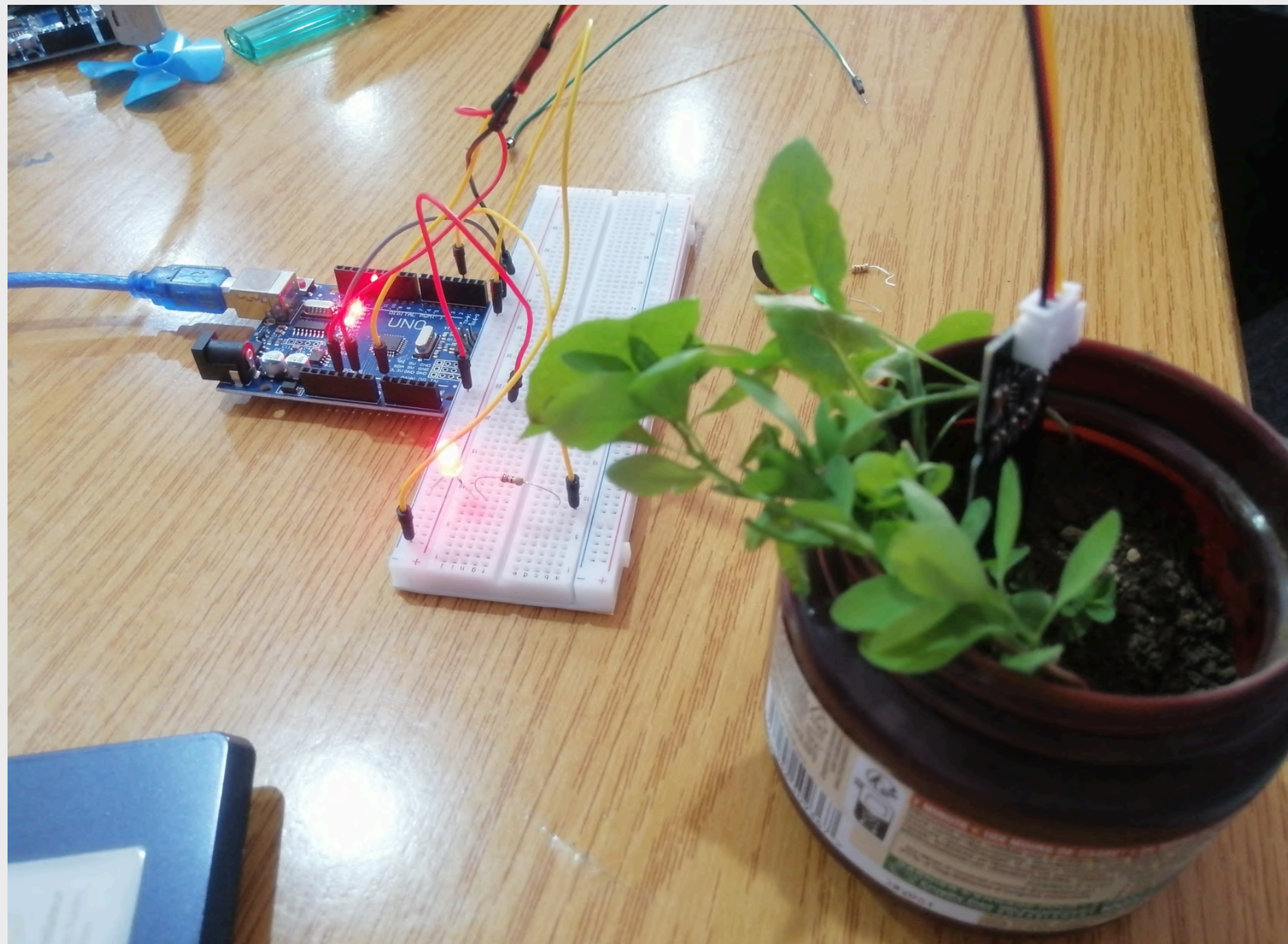


```
SoilMoist | Arduino IDE 2.3.6
File Edit Sketch Tools Help
[Icons] Arduino Uno
SoilMoistino
1 int soilPin = A0;
2 int soilValue;
3 int PUMP = 0;
4
5 void setup() {
6   Serial.begin(9600);
7   pinMode(PUMP, OUTPUT);
8 }
9
10 void loop() {
11   soilValue = analogRead(soilPin);
12
13   if (soilValue > 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
23
```

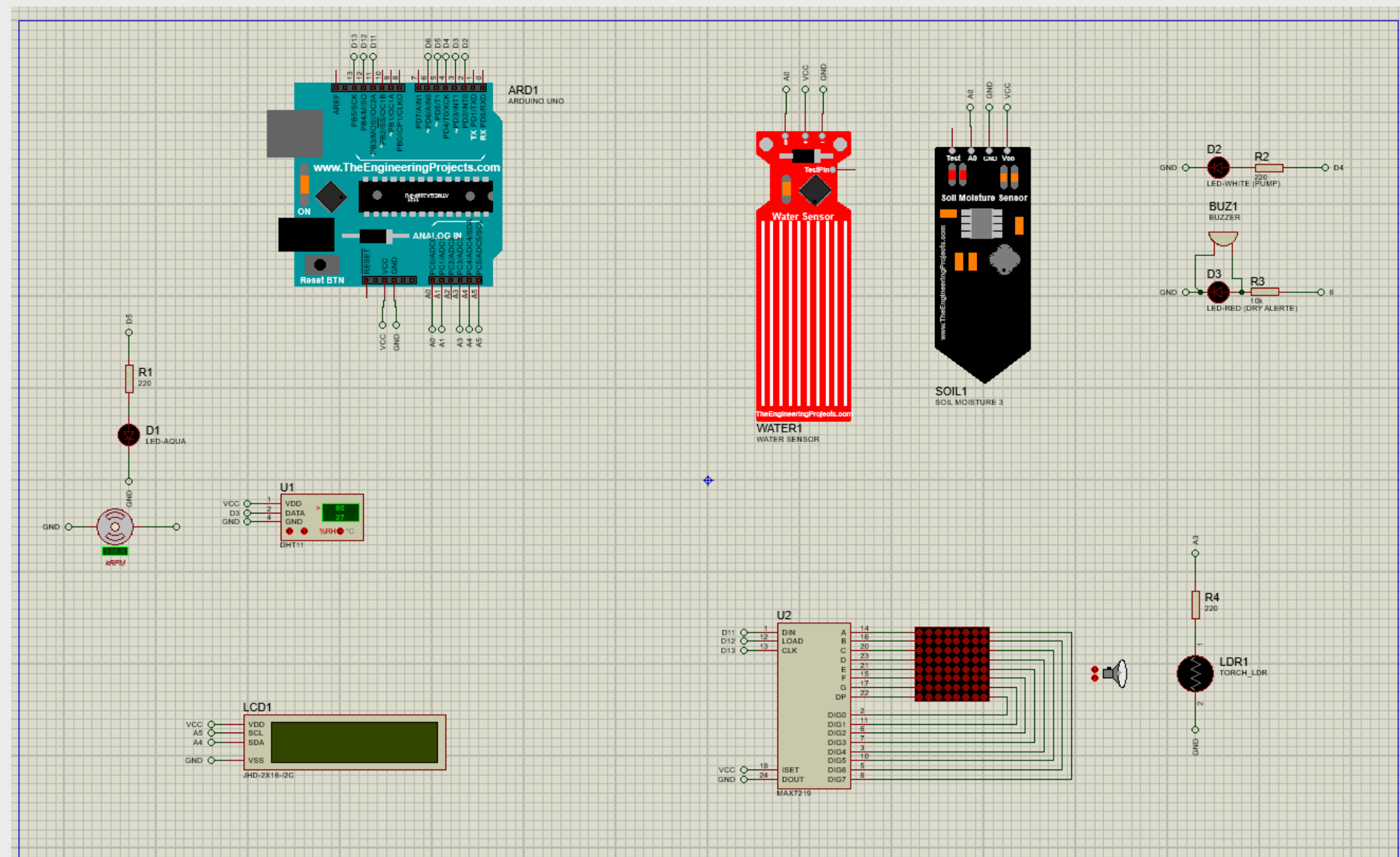
Ln 1, Col 1 Arduino Uno on COM4 [not connected]



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;
```

```
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);
```



05 L'ensemble du système

```
SystemEntretienDePlante.ino
70 soilValue = analogRead(SOILPIN);
71 waterLevelValue = analogRead(waterLevelPin);
72 int ldrValue = analogRead(LDR_PIN);
73
74 float humidity = dht.readHumidity();
75 float temperature = dht.readTemperature();
76
77 // ===== Light/Dark Duration =====
78 Serial.println(ldrValue); // Only print LDR value
79
80 if (ldrValue < ldrThreshold) {
81     delay(3000);
82     // Turn ON ALL LEDs (all rows + all columns)
83     for (int row = 0; row < 8; row++) {
84         lc.setRow(0, row, 0b11111111); // Binary 255 = ALL LEDs in row ON
85     }
86 }
87 else {
88     lc.clearDisplay(0); // Turn OFF ALL LEDs
89 }
90 delay(100);
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 // ===== Fan Control =====
105
```

```
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 %
```



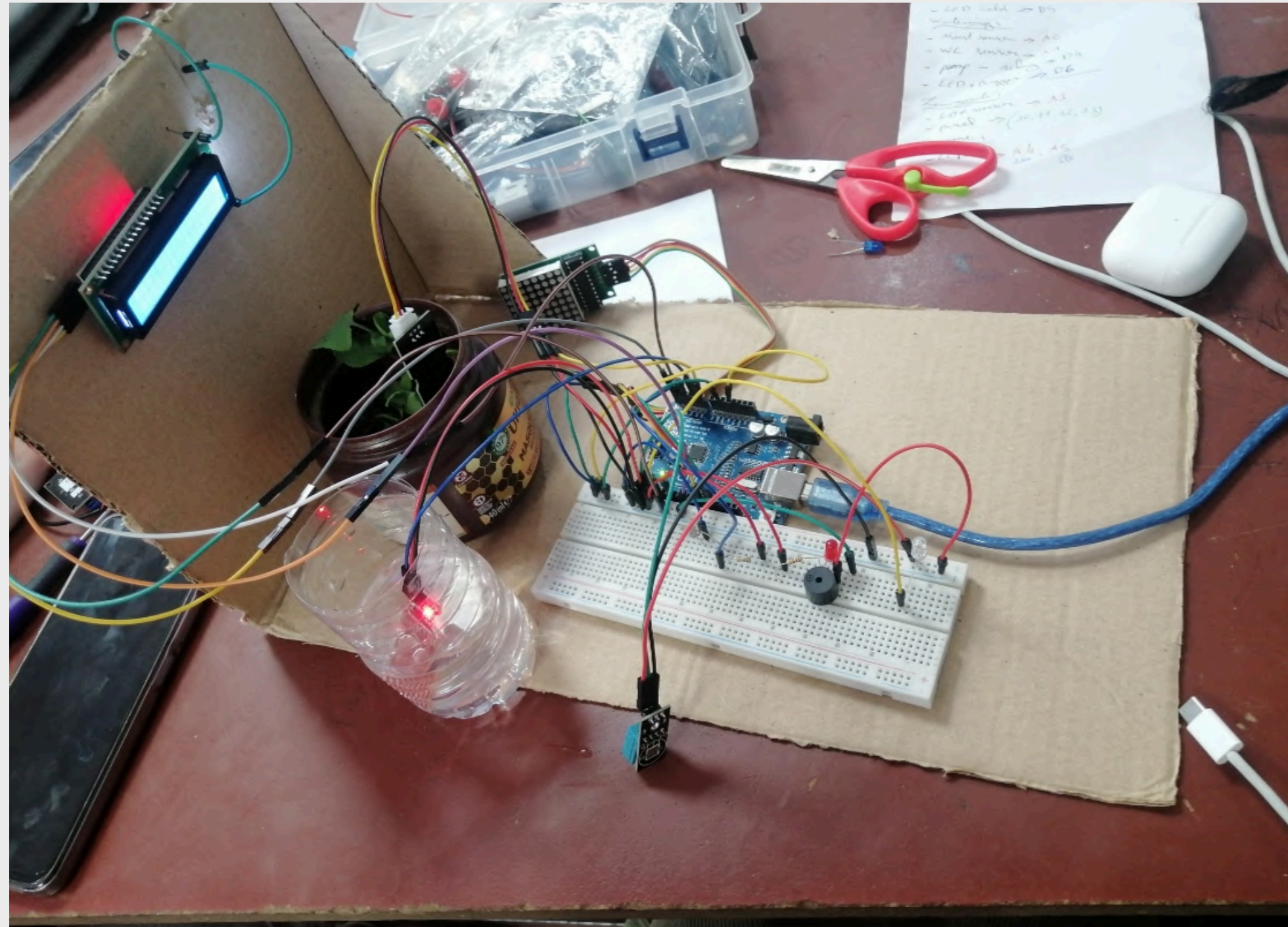
05 L'ensemble du système

```
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