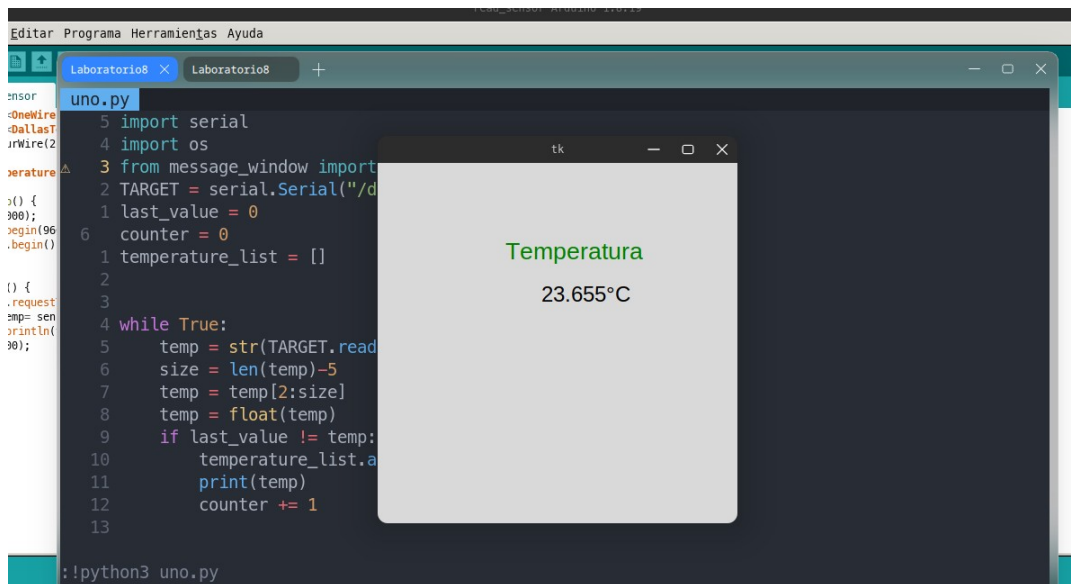


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Programación III

# **Laboratorio No. 8**

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[Repositorio del Código](#)



Codigo Arduino:

```
1 #include <OneWire.h>
2 #include <DallasTemperature.h>
3 OneWire ourWire(2);
4
5 DallasTemperature sensors(&ourWire);
6
7 void setup() {
8     delay(1000);
9     Serial.begin(9600);
10    sensors.begin();
11 }
12
13 void loop() {
14    sensors.requestTemperatures();
15    float temp= sensors.getTempCByIndex(0);
16    Serial.println(temp);
17    delay(100);
18 }
19
```

## Codigo Python

```
1  import serial
2  import os
3  from message_window import *
4  TARGET = serial.Serial("/dev/ttyUSB0", 9600)
5  last_value = 0
6  counter = 0
7  temperature_list = []
8
9  while True:
10     temp = str(TARGET.readline())
11     size = len(temp)-5
12     temp = temp[2:size]
13     temp = float(temp)
14     if last_value != temp:
15         temperature_list.append(temp)
16         print(temp)
17         counter += 1
18
19     if counter == 6:
20         break
21
22     last_value = temp
23
24  os.system('clear')
25  suma = 0
26  size_list = 0
27  for i in temperature_list:
28     suma += i
29     size_list += 1
30
31  result = str(suma/size_list)
32  application = App(result)
```

## Ejercicio #2

### Arduino

```
1  #include <OneWire.h>
2  #include <DallasTemperature.h>
3  #define green_led 8
4  #define blue_led 7
5  float last_status = 0.0;
6  int counter = 0;
7
8  int isHigher(int temperature, int reference){
9      return temperature + 2 == reference;
10 }
11
12 int isLower(int temperature, int reference){
13     return temperature - 2 == reference;
14 }
15
16
17 void blink_led(int pin){
18     digitalWrite(pin, HIGH);
19     delay(100);
20     digitalWrite(pin, LOW);
21     digitalWrite(pin, HIGH);
22     delay(100);
23     digitalWrite(pin, LOW);
24     digitalWrite(pin, HIGH);
25     delay(100);
26     digitalWrite(pin, LOW);
27 }
28
29
30 OneWire ourWire(2);
31 DallasTemperature sensors(&ourWire);
32
33 void setup() {
34     delay(1000);
35     Serial.begin(9600);
36     sensors.begin();
37     pinMode(green_led, OUTPUT);
38     pinMode(blue_led, OUTPUT);
39 }
40
41 void loop() {
42     sensors.requestTemperatures();
43     float temp= sensors.getTempCByIndex(0);
44     if(isHigher((int)temp, (int)last_status)){
45         blink_led(green_led);
46     }
47     else if(isLower((int)temp, (int)last_status)){
48         blink_led(blue_led);
49     }
50     Serial.println(temp);
51
52     if(counter == 2){
53         last_status = temp;
54     }
55     counter++;
56
57     delay(100);
58 }
59 }
```

## Ejercicio #3

### Codigo Python

```
1 import serial
2 from alert_window import *
3 TARGET = serial.Serial("/dev/ttyUSB0", 9600)
4 initial_value = 0
5 last_status = 0
6 cont = 0
7
8 while True:
9     temp = str(TARGET.readline())
10    size = len(temp)-8
11    temp = temp[2:size]
12    num = int(temp)
13    print(num)
14    print(f"initial_value: {num}")
15    if cont != 0:
16        if num != last_status:
17            if (num >= initial_value + 2) or num <= initial_value - 2 and cont > 5:
18                show_message()
19
20
21
22    if cont == 1:
23        initial_value = num
24
25    cont += 1
26    last_status = num
```

### Codigo Arduino:

*Mismo que en ejercicio #1*

#### Ejercicio #4

Codigo arduino mismo que en el primer ejercicio

Codigo Python:

```
1  import serial
2  import time
3  import csv
4  from datetime import datetime
5
6  board = serial.Serial("/dev/ttyUSB0", 9600)
7  initial = datetime.now()
8  while True:
9
10     temp = str(board.readline())
11     size = len(temp)-8
12     temp = temp[2:size]
13     print(temp)
14     with open("temperature_history.csv", "a") as f:
15         writer = csv.writer(f, delimiter=",")
16         final = datetime.now()
17         _time = final - initial
18         minutes = _time.seconds/60
19         writer.writerow([round(minutes,2), temp])
20
21
```

*Codigo para leer la informacion guardada del sensor en “csv”*

```
1
2 import matplotlib.pyplot as plt
3 import csv
4
5 x = []
6 y = []
7
8 with open('temperature_history.csv','r') as csvfile:
9     lines = csv.reader(csvfile, delimiter=',')
10    for row in lines:
11        x.append(row[0])
12        y.append(int(row[1]))
13
14 plt.plot(x, y, color = 'g', linestyle = 'dashed',
15         marker = 'o', label = "History Temperature")
16
17 plt.xticks(rotation = 25)
18 plt.xlabel('Minutes')
19 plt.ylabel('Temperature(°C)')
20 plt.title('Temperature History', fontsize = 20)
21 plt.grid()
22 plt.legend()
23 plt.show()
24
```

