

PRACTICE 1

Diego Viñals Lage

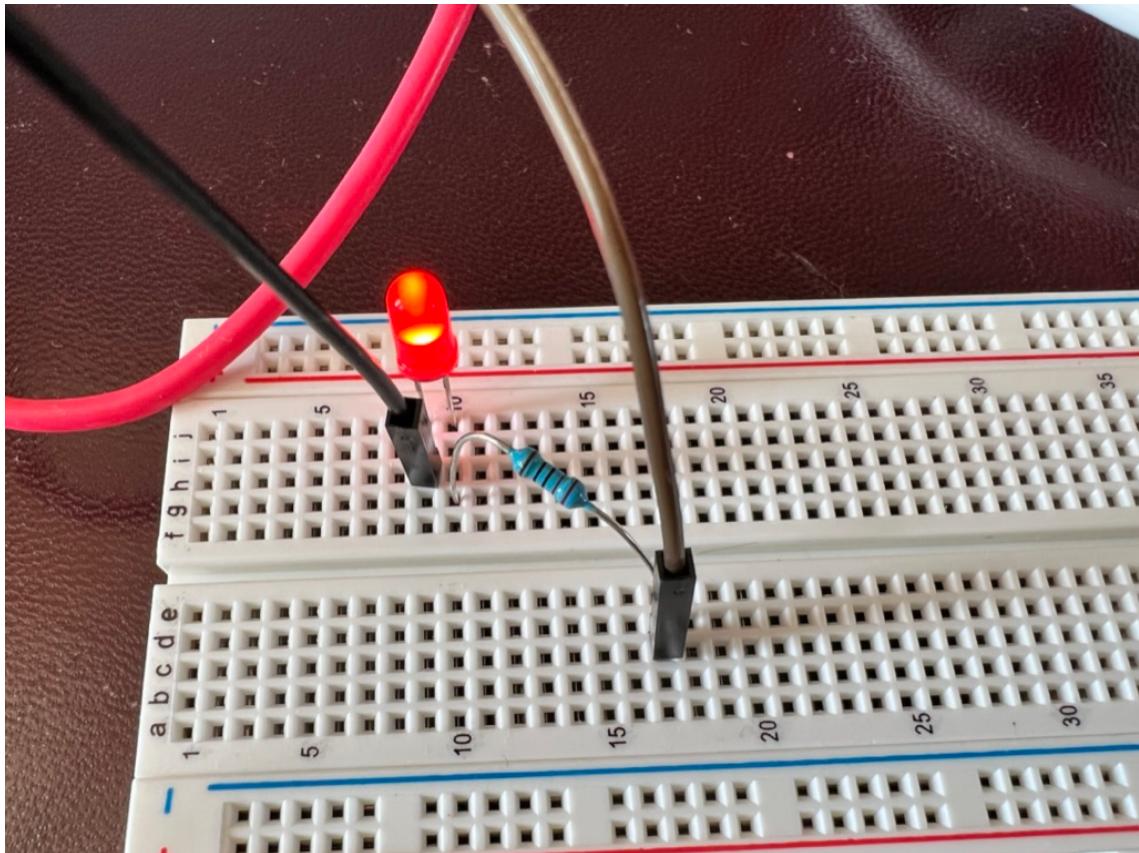
FUNDAMENTOS DE LA PROGRAMACION CON RASPBERRY PI

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First Part

Led



I connected a Led with a resistor and programmed in python what the LED should do. It lights up, waits one second, and then it turns off and waits another second. This goes on and on until manually stopped.

Code:

```
From gpiozero import LED  
From time import sleep
```

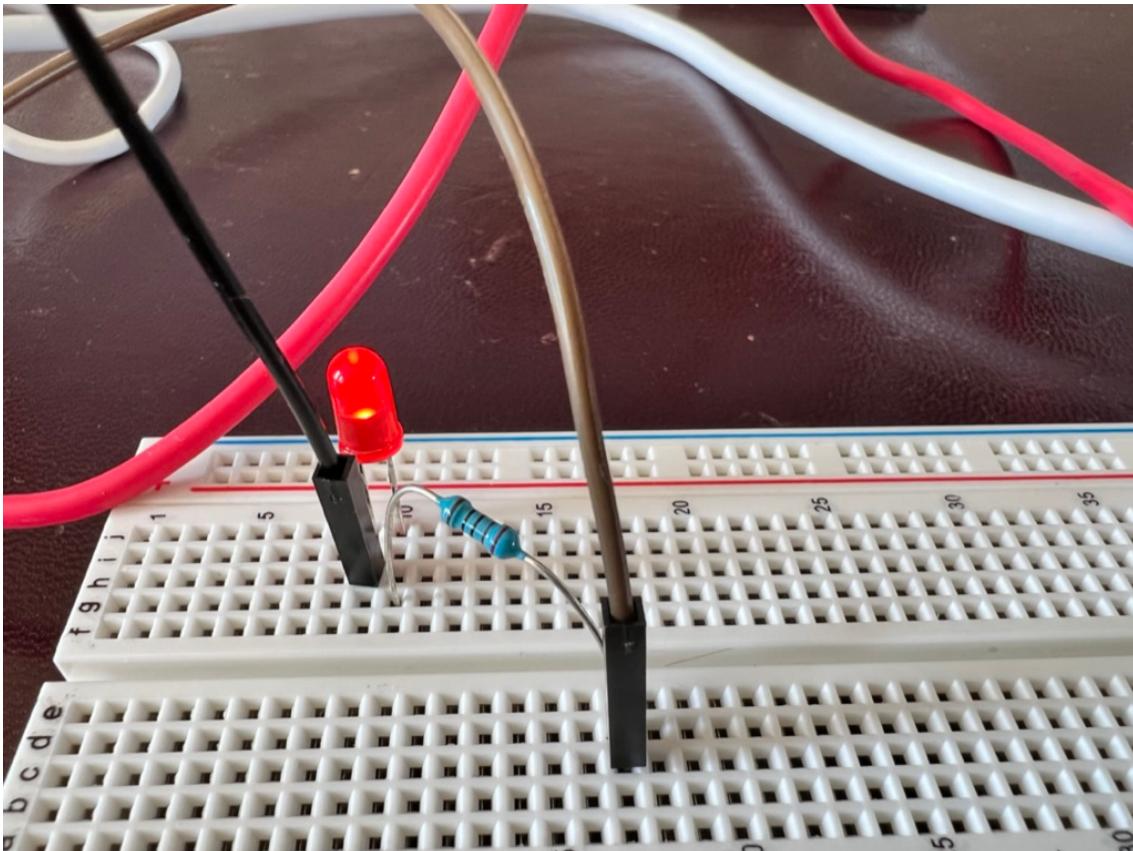
```
Red = LED(17) // it is connected to GPIO 17
```

While True:

```
    Red.on()  
    Sleep(1)  
    Red.off()  
    Sleep(1)
```

Led with variable brightness

It is the same as LED, but this time the user controls de brightness of the LED. Where is a picture of the LED with 50% brightness.



We can see comparing it to the other picture that the LED is not at full brightness.

Code:

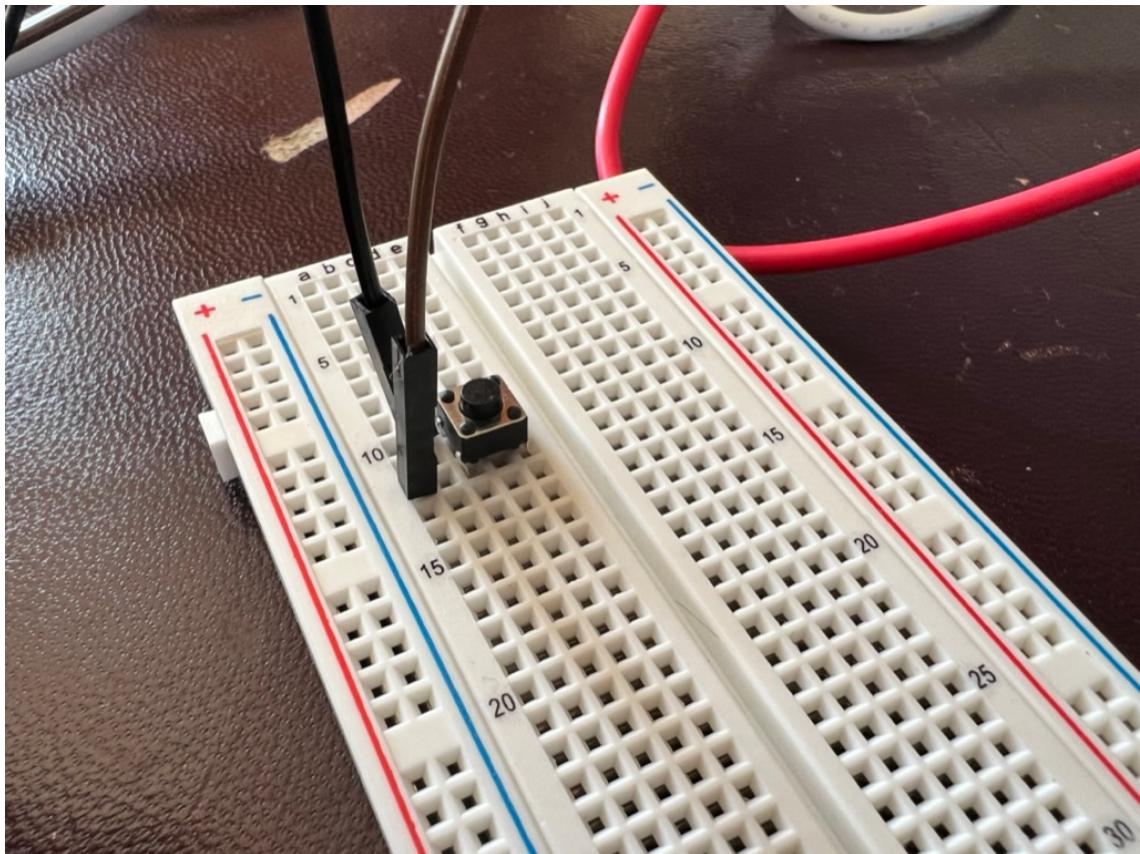
```
From gpiozero import PWMLED  
From time import sleep
```

```
Red = PWMLED (17) // it is connected to GPIO 17
```

While True:

```
    Red.value = 0  
    Sleep(1)  
    Red.value = 0.5 // picture  
    Sleep(1)  
    Red.value = 1  
    Sleep(1)
```

Button



We connected a button, when pressed a message is shown on screen: "Button is pressed"

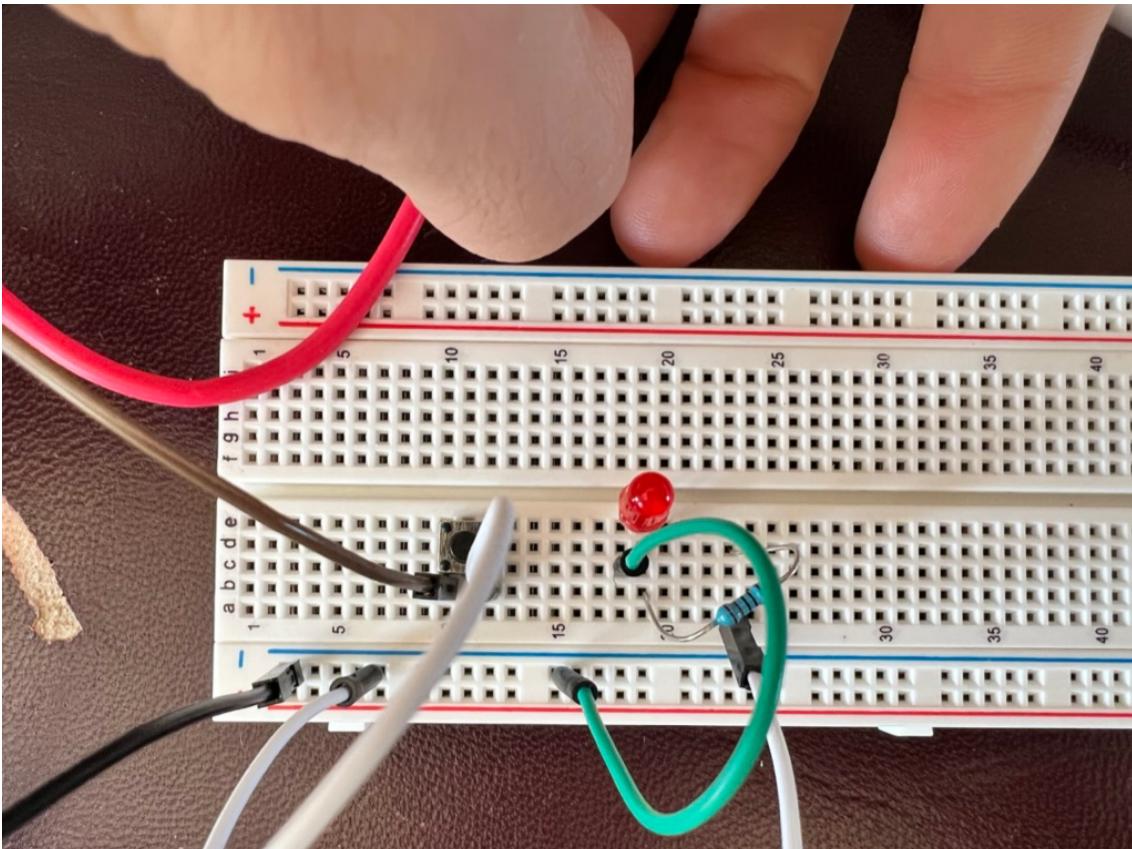
Code:

```
From gpiozero import Button  
  
Button = Button(2) // connected to pin Nº2  
While True:  
    If button.is_pressed:  
        Print("Button is pressed")  
    Else:  
        Print("Button Not pressed")
```

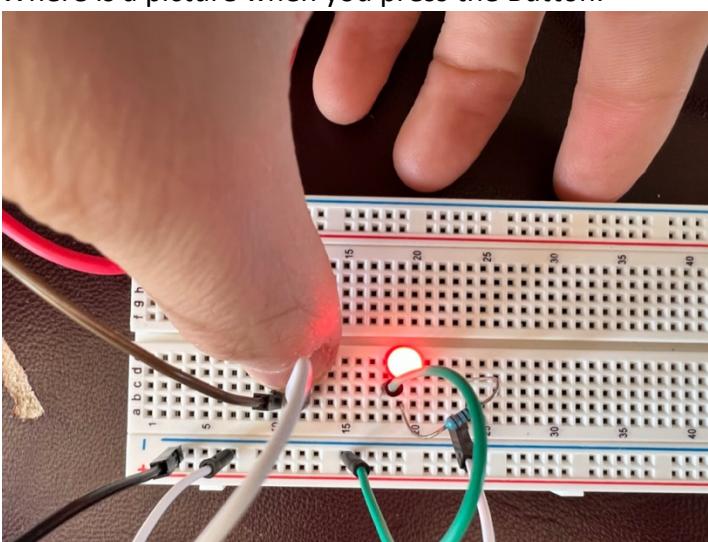
Button Controlled LED

We connected a button and a LED, when the button is not pressed, the LED is turn off, when you press the button, it lights up.

Where is a picture when the button is not pressed



Where is a picture when you press the Button.



Code:

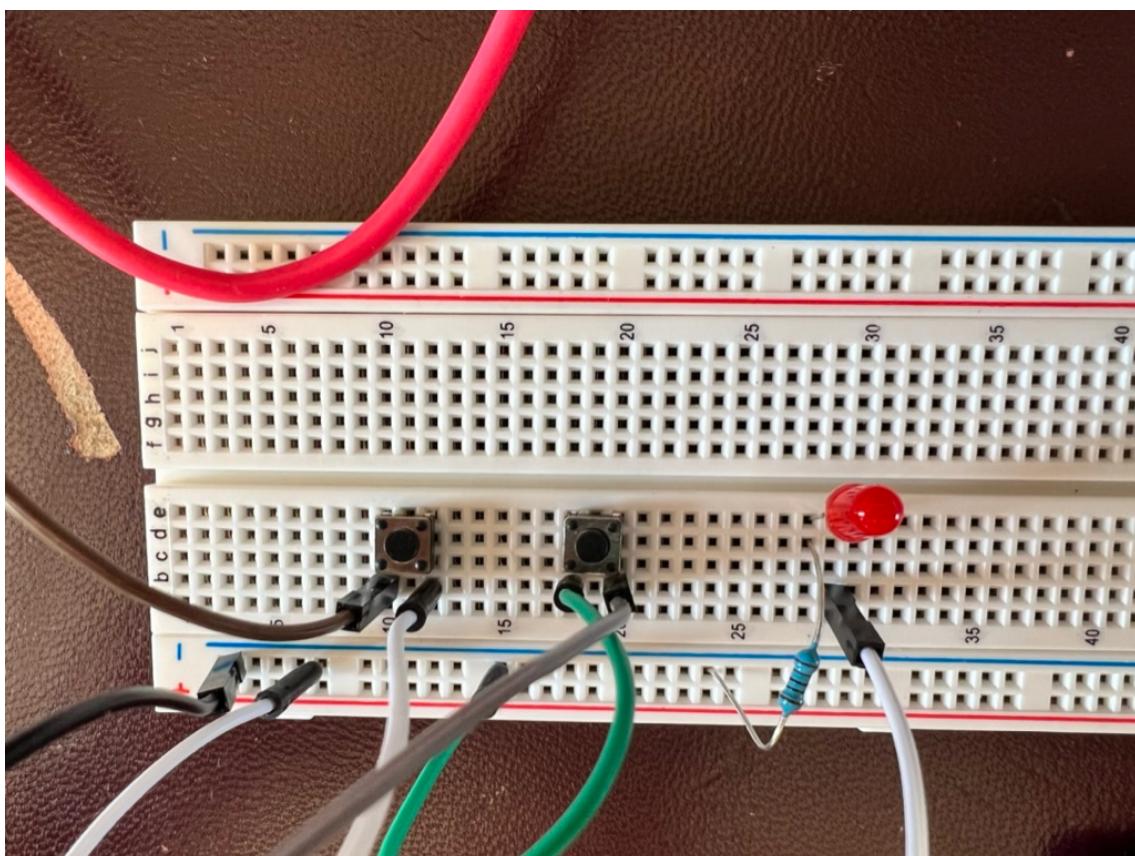
```
From gpiozero import Button, LED  
From signal import pause
```

```
Button = Button(2) // connected to pin Nº2  
Red = LED(17)
```

```
Button.when_pressed = red.on  
Button.when_released = red.off
```

```
Pause()
```

Reaction Game



In this example, the Led is going to turn on at a random time, and the first person who presses his button wins. It will show on screen the player who wins.

Code:

```
From gpiozero import Button, LED
From signal import pause

import random

led = LED(17)
player 1= Button(2)
player 2 = Button(3)
time = random.uniform(5,10)

sleep(time)
led.on()

while True:
    if player1.is pressed:
        print ("Player 1 wins!")
        break
    if player 2.is pressed:
        print ("Player 2 wins!")
        break
led.off()
```

Second Part

We can do a proximity sensor, and when the distance is less than one meter, the LED turns on, to let us know we reached the distance. I don't have a distance sensor right now so I can't reproduce this example.

Another example that we can do, is a traffic light, with 3 LEDs and 1 button. We turn on the Green Led, and each time we press the button, this led turns off and another led turns on, the yellow one. If we press another time, this one turns off and the red one turns on.

Third Part

In this part, I am going to do an alarm system. We are going to need, the camera module, the distance sensor, a led, and a speaker.

We are going to connect all these things, and programmed it so, when the alarm is activated, if it detects some motion with the distance sensor, it turns the speaker to make a noise, so that you know that the alarm has been triggered.

When the alarm is triggered, the camera module should take a picture and send it to you. This picture is going to take your hall entrance to your house, and the LED is going to turn red.

The pseudocode is going to be more like this.

The alarm is activated,

While true:

If distance_sensor is more than 3 meters, then

Led off

Camera off

Speaker off

If distance_sensor is less than 3 meters,

Take picture

Send it to email

Speaker at 100%

Led on

Enter code:

If code = usercode

Then

Led off

Camera off

Speaker off