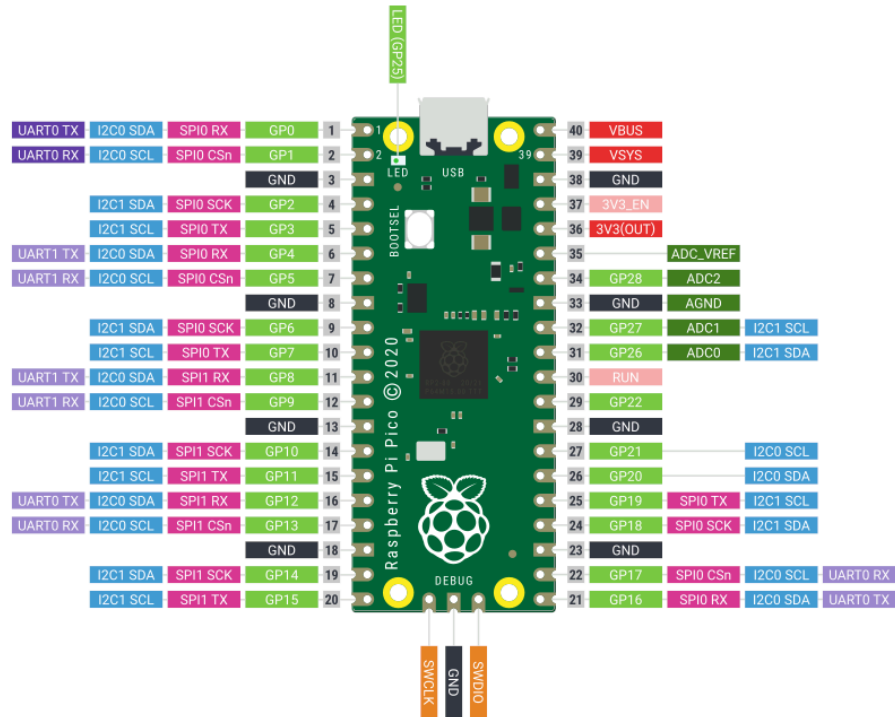


Exercise no 1: General Purpose Inputs/Outputs



Task 1. Create a MicroPython script to blink the built-in LED every 500[ms]. The LED is connected to the GPIO 25.

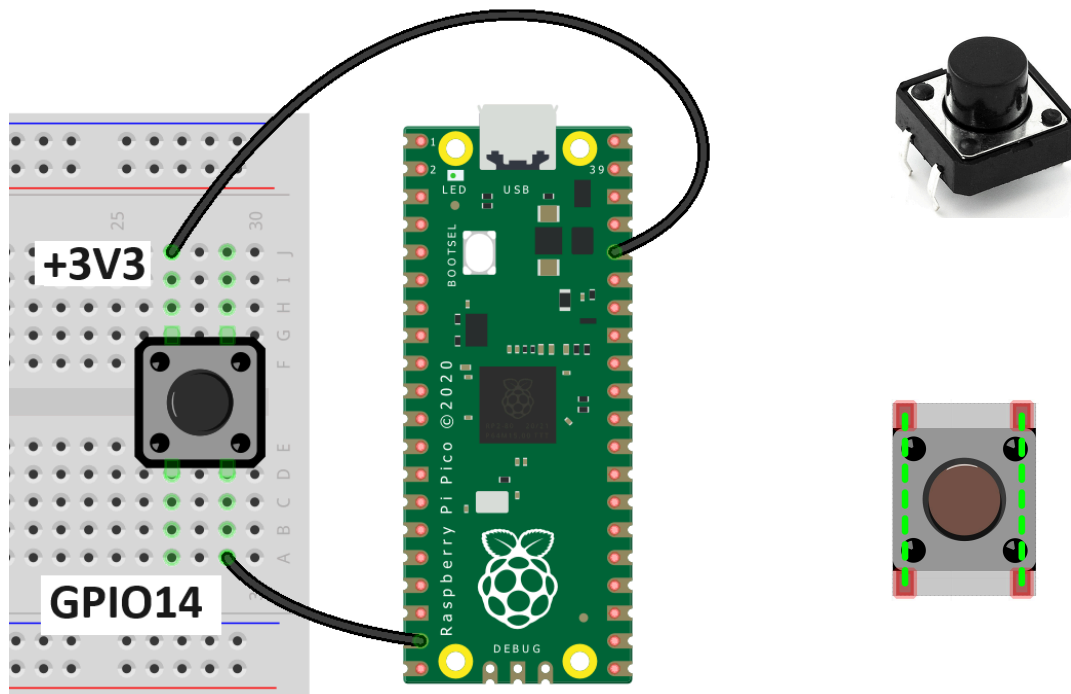
```
import machine
import utime

led_builtin = machine.Pin(25, machine.Pin.OUT)

while True:
    led_builtin.toggle()
    utime.sleep(0.5)
```

Task 2. Connect a tact switch to the Raspberry Pi Pico board. Use GPIO 14 (GP14). The other switch terminal should be connected to the 3V3 pin. Create a MicroPython script to send a *"Button pressed"* message to the computer after the button has been pressed.

Exercise no 1: General Purpose Inputs/Outputs



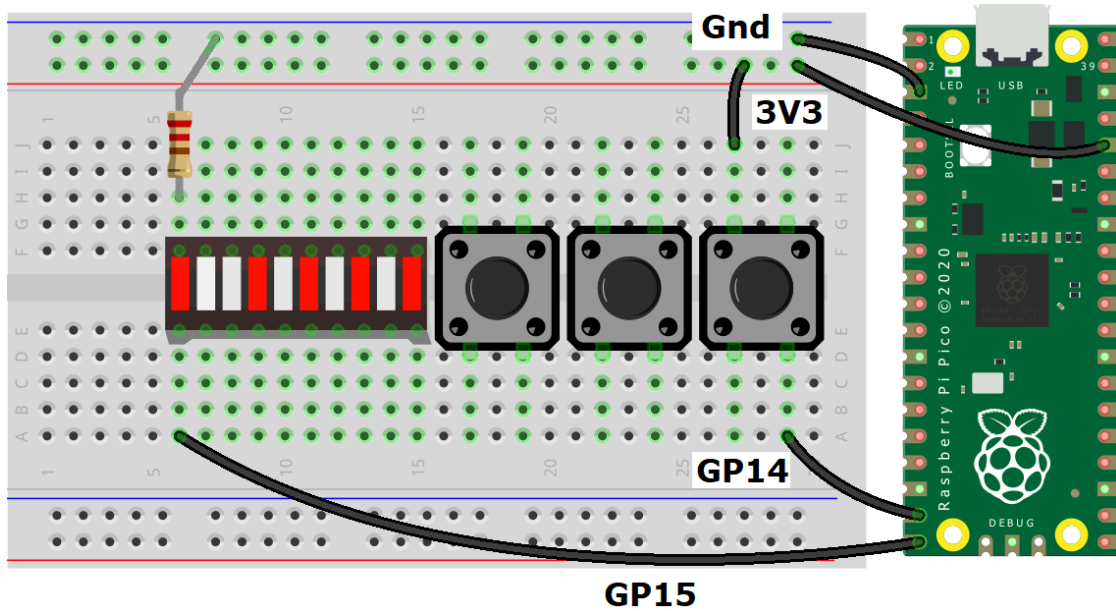
```
from machine import Pin
import utime

button = Pin(14, Pin.IN, Pin.PULL_DOWN)

while True:
    if button.value() == 1:
        print("Button pressed")
        utime.sleep(0.5)
```

Task 3. Connect the following circuit. A button connected to the GPIO14 controls the built-in LED. If this button is pressed the LED should emit light. Otherwise, it should be turned off. Use a 120R current limiting resistor.

Exercise no 1: General Purpose Inputs/Outputs



```
from machine import Pin
import utime

button = Pin(14, Pin.IN, Pin.PULL_DOWN)
led = Pin(15, Pin.OUT)
led.value(1)

while True:
    if button.value() == 1:
        led.value(0)
    else:
        led.value(1)
        utime.sleep(0.1)
```

Task 4. Use the Task 3 circuit. Create a MicroPython script to produce 4 LED blinks after the button has been pressed.

```
from machine import Pin
from utime import sleep
```

Exercise no 1: General Purpose Inputs/Outputs

```
button = Pin(14, Pin.IN, Pin.PULL_DOWN)
led = Pin(15, Pin.OUT)

def led_blink(pin, times):
    for i in range(times):
        pin.toggle()
        sleep(0.5)
        pin.toggle()
        sleep(0.5)

led.value(0)

while True:
    if button.value() == 1:
        led_blink(led, 5)
        sleep(0.1)
```

Task 5. Use the Task 3 circuit. Create a MicroPython script to implement the functionality of a monostable light switch.

```
from machine import Pin
from utime import sleep

button = Pin(14, Pin.IN, Pin.PULL_DOWN)
light = Pin(15, Pin.OUT)

def button_clicked(pin):
    if pin.value() == 1:
        sleep(0.1)
        while pin.value() == 1:
            pass
```

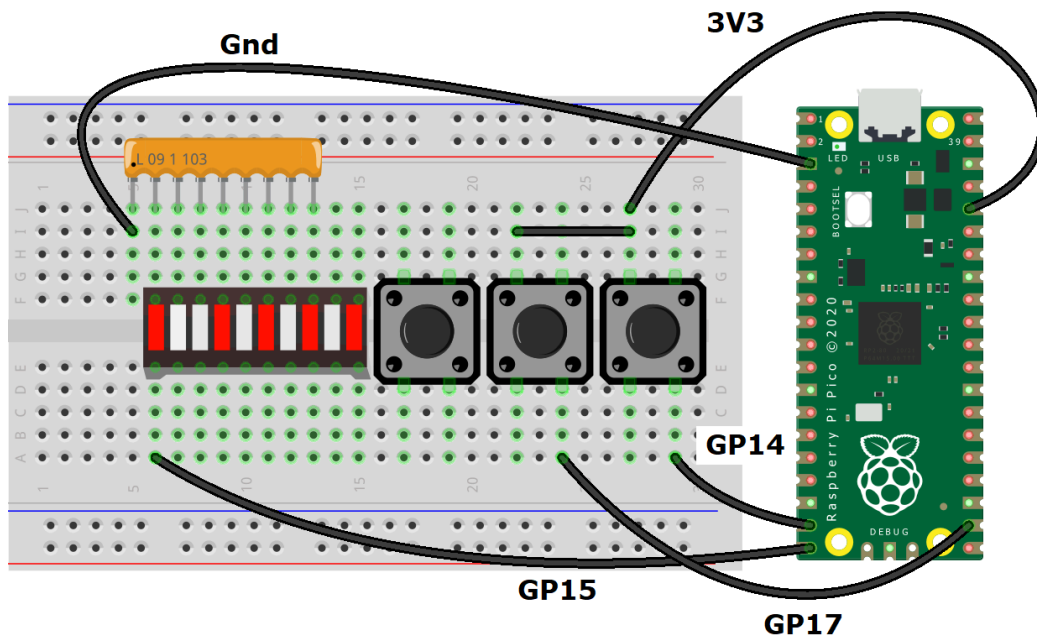
Exercise no 1: General Purpose Inputs/Outputs

```
        return True
    else:
        return False

light.value(0)

while True:
    if button_clicked(button):
        light.toggle()
```

Task 6. Connect the following circuit. Use 2 buttons (GPIO17, GPIO14) to control the LED connected to GPIO15 (GP15). The built-in LED (GPIO25) should blink every second.



```
from machine import Pin
from utime import sleep
import _thread
```

Exercise no 1: General Purpose Inputs/Outputs

```
button_L = Pin(17, Pin.IN, Pin.PULL_DOWN)
button_R = Pin(14, Pin.IN, Pin.PULL_DOWN)
buildin_led = Pin(25, Pin.OUT)
external_led = Pin(15, Pin.OUT)

def led_blink():
    while True:
        buildin_led.toggle()
        sleep(0.5)

_thread.start_new_thread(led_blink, ())
```

```
def button_clicked(pin):
    if pin.value() == 1:
        sleep(0.1)
        while pin.value() == 1:
            pass
        return True
    else:
        return False
```

```
while True:
    if button_clicked(button_R):
        external_led.value(1)
        print("R click")
    if button_clicked(button_L):
        external_led.value(0)
        print("L click")
```

Task 7. Create a MicroPython script that switches off the built-in LED, after 3 seconds from the moment the user releases the button. Use another switch to reset the script.

Task 8. Create a MicroPython script to send how many times a selected button has been clicked.

Task 9. Built a device prototype that measures the user's reaction time.

For those interested:

1. MicroPython web page:

micropython.org/download/rp2-pico/

2. Python programming tutorial:

www.programiz.com/python-programming/first-program

3. Getting started with Raspberry Pi Pico:

projects.raspberrypi.org/en/projects/getting-started-with-the-pico/0