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stemoutreach Update LED_Buzzer_Button_Worksheet.md

a3eeb16 · 11 hours ago

History

[Preview](#)[Code](#)[Blame](#)

83 lines (56 loc) · 2.33 KB

[Raw](#)

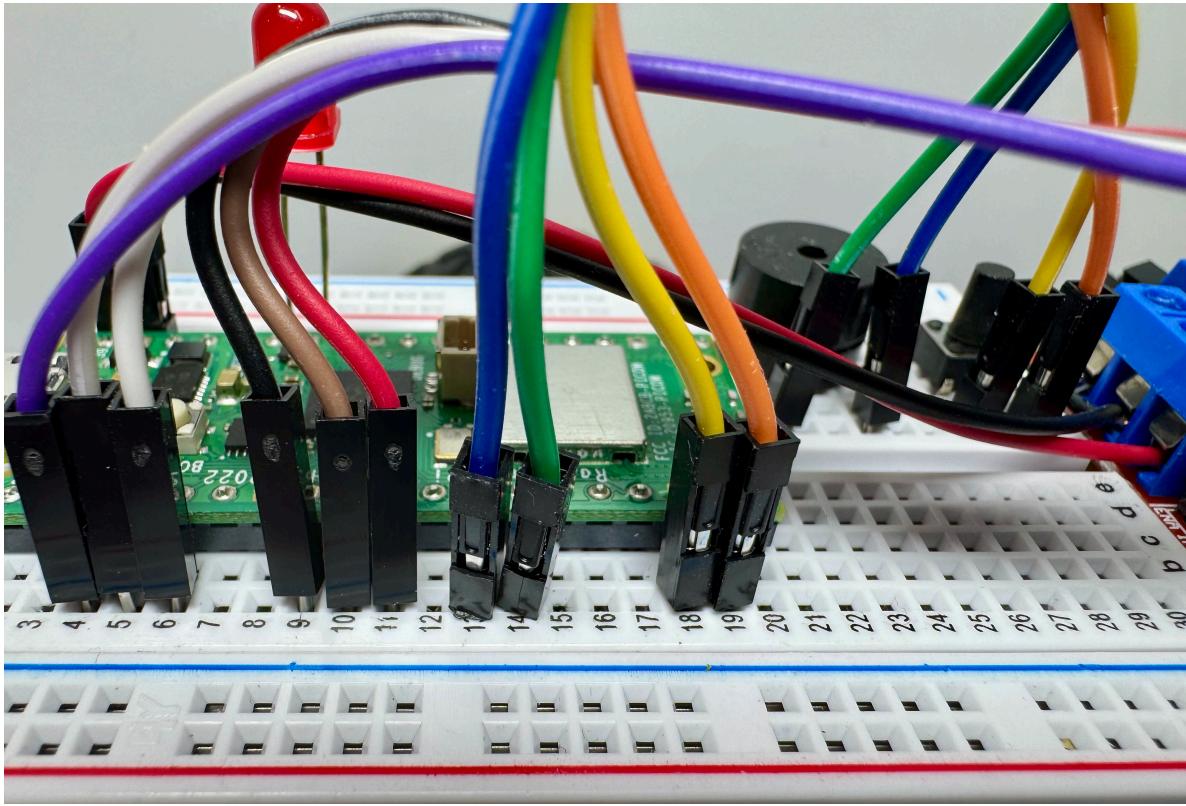
☐ Raspberry Pi Worksheet: LED, Buzzer, and Button

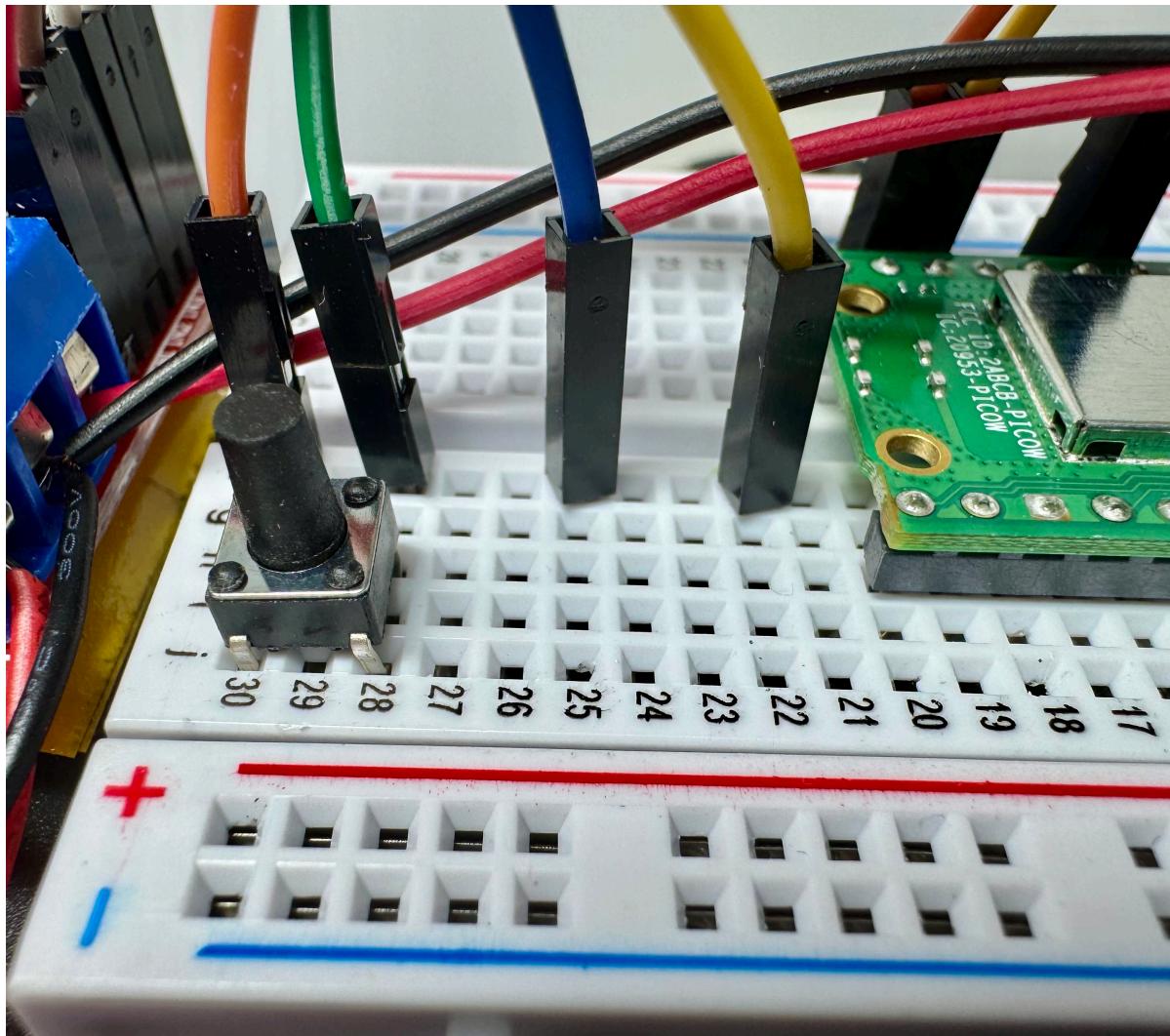
Objective:

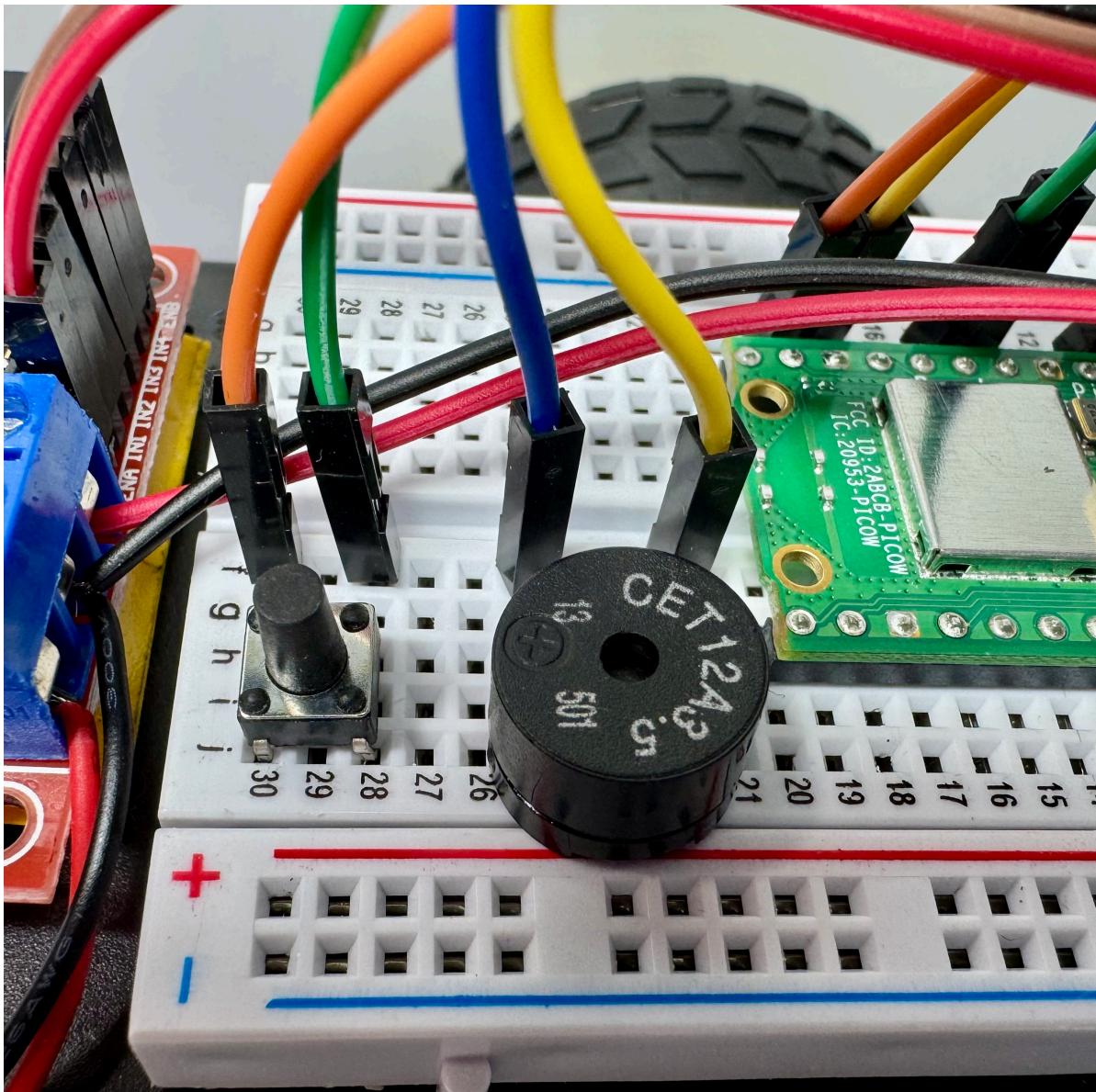
Learn how to control an LED and a buzzer using a button with the Raspberry Pi Pico.

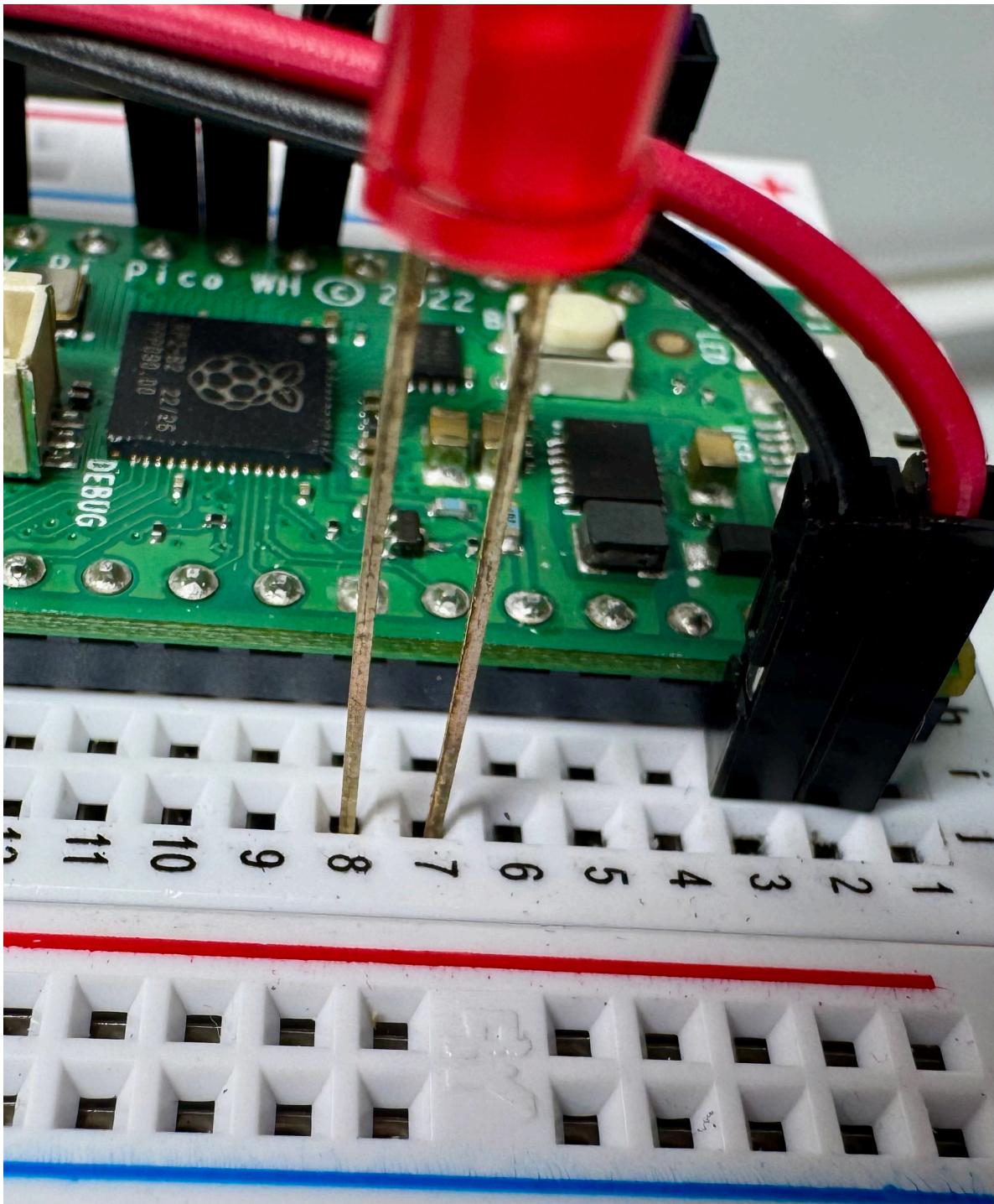
☐ Wiring Summary

| Component | Description | GPIO Pin |
|-----------|-------------------------------|----------|
| LED | Long leg to GPIO via resistor | GP28 |
| Buzzer | Positive to GPIO | GP10 |
| Button | One leg to GPIO, one to GND | GP14 |











□ Python Code with Comments

```
from machine import Pin
import time

# Set up output devices
led = Pin(28, Pin.OUT)          # GP28 controls the LED
buzzer = Pin(10, Pin.OUT)        # GP10 controls the buzzer

# Set up input device (button)
button = Pin(14, Pin.IN, Pin.PULL_UP) # GP14 reads button state

# Function to turn on alert
def alert_on():
    led.high()                  # Turn on LED
    buzzer.high()                # Turn on buzzer
    print("Alert ON")

# Function to turn off alert
def alert_off():
    led.low()                   # Turn off LED
    buzzer.low()                 # Turn off buzzer
    print("Alert OFF")

# Main loop: wait for button press
print("Press the button to turn on the LED and buzzer!")

while True:
    if button.value() == 0:      # Button is pressed
```



```
alert_on()  
time.sleep(0.5)      # Keep alert on briefly  
alert_off()  
time.sleep(0.5)      # Delay to avoid double press
```

✍ Challenges

1. **Change how long the alert stays on.** Try adjusting the `time.sleep()` values.
2. **Make it stay on as long as the button is held down.**
3. **Try making the buzzer beep multiple times when the button is pressed.**
4. **Can you make the LED blink while the buzzer is on?**

✓ Reflection Questions

- What does the `.value()` function do for the button?
- Why do we use `Pin.PULL_DOWN` for the button setup?
- What happens if we connect the button without a pull resistor?

Have fun experimenting with electronics! ☺☺