



stemoutreach Update Motors_Separate_Functions_Worksheet.md

885e416 · 11 hours ago [History](#)

Raspberry Pi Robotics: Using Separate Files for Functions

Preview

Code

Blame

138 lines (102 loc) · 2.65 KB

Raw

Project File Structure

You'll create two files:

1. `robot_utils.py` – stores all the motor and alert functions
2. `main.py` – runs the robot and uses the functions from `robot_utils.py`

□ robot_utils.py (Put This on Your Pico)



```
from machine import Pin
import time

# Motor Pins
In1 = Pin(6, Pin.OUT)
In2 = Pin(7, Pin.OUT)
EN_A = Pin(8, Pin.OUT)

In3 = Pin(4, Pin.OUT)
In4 = Pin(3, Pin.OUT)
EN_B = Pin(2, Pin.OUT)

# Enable the motors
EN_A.high()
EN_B.high()

# LED and buzzer
led = Pin(28, Pin.OUT)
buzzer = Pin(10, Pin.OUT)

# Motor functions
def move_forward():
    In1.high()
    In2.low()
    In3.high()
    In4.low()

def move_backward():
    In1.low()
    In2.high()
    In3.low()
    In4.high()
```

```
def turn_left():  
    In1.low()  
    In2.high()  
    In3.high()  
    In4.low()  
  
def turn_right():  
    In1.high()  
    In2.low()  
    In3.low()  
    In4.high()  
  
def stop_motors():  
    In1.low()  
    In2.low()  
    In3.low()  
    In4.low()  
  
# Alert functions  
def alert_on():  
    led.high()  
    buzzer.high()  
    print("Alert ON")  
  
def alert_off():  
    led.low()  
    buzzer.low()  
    print("Alert OFF")
```

□ main.py (Your Main Program)

```
from machine import Pin
import time
import robot_utils # This brings in all the functions

# Setup button
button = Pin(14, Pin.IN, Pin.PULL_UP) # Button connected to GND

print("Press the button to reverse and beep!")

while True:
    if button.value() == 0: # Button pressed
        robot_utils.move_backward()
        time.sleep(1)
        robot_utils.stop_motors()
        time.sleep(0.5)
```



🔧 Challenges

1. Modify main.py to use other movement functions (like turn_left()).
2. Add a second button for a different action (turn or forward).
3. Try adding a function in robot_utils.py called wiggle() that turns left and right quickly!
4. Try making the robot beep when moving backwards

```
if button.value() == 0:
    robot_utils.move_backward()

    # Beep 3 times while reversing
```



```
for i in range(3):  
    robot_utils.alert_on()  
    time.sleep(0.2)  
    robot_utils.alert_off()  
    time.sleep(0.2)  
  
robot_utils.stop_motors()
```

✓ Reflection Questions

- Why is it helpful to separate functions into a different file?
- Could this help in larger robot projects?
- What happens if you forget to import the file?

Start organizing your code like a pro! ☐☐☐