



Name: _____

Assessment Traffic Light

- 1) Why is it essential to connect the GROUND pin to the breadboard's blue column in the traffic light circuit?
 - a) To increase the brightness of the LEDs
 - b) To ensure the circuit has a complete path for current to flow
 - c) To measure the resistance of the resistors
 - d) To change the color of the LEDs

- 2) In the tutorial, what is the purpose of a resistor in the circuit?
 - a) To increase the current in the circuit
 - b) To store energy
 - c) To control the current in the circuit
 - d) To light up the LED

- 3) Which GPIO pin is the green LED connected to in the tutorial?
 - a) GP13
 - b) GP14
 - c) GP15
 - d) GP12

- 4) What programming block makes the traffic light cycle code repeat?
 - a) Start block
 - b) Wait block
 - c) Repeat while true block
 - d) Duplicate block

- 5) How can the Digital View tab assist you in troubleshooting your traffic light circuit?
 - a) By showing the exact timing of each light cycle
 - b) By displaying the power consumption of the LEDs
 - c) By indicating which GPIO pins are currently active
 - d) By providing a detailed description of each LED's color

- 6) Explain how you could modify the traffic light program to respond to actual traffic conditions. For example, what changes would you make if you wanted the green light to stay on longer when there are more cars?



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7) Imagine you are designing a crosswalk signal for a busy city street. How would you adjust the code and hardware from the tutorial to create a pedestrian signal that ensures people can cross safely?

8) Look at the Python code below. The red light (GP15) stays on for 10 seconds. How could you change the code so that the red light only stays on for 5 seconds instead? Write down the new code that would make this happen.



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Answer Key Traffic Light

- 1) B - To ensure the circuit has a complete path for current to flow
- 2) C - To control the current in the circuit
- 3) A - GP13
- 4) C - Repeat while true block
- 5) C - By indicating which GPIO pins are currently active
- 6) *Example:* To make the green light stay on longer when there are more cars, I would add a sensor to detect the number of cars waiting. If the sensor detects many cars, I could program the light to extend the green time using an if-else statement. This way, the light would stay green longer, allowing more cars to pass.
- 7) *Example:* To create a pedestrian signal, I would add another LED to represent the walking person and a red LED for the stop hand. I would adjust the code so that when the button is pressed, the green walking light turns on for a set time, followed by a flashing red light to warn that the light is about to change and then a solid red light to stop. The timing could be adjusted based on the width of the street to ensure that pedestrians have enough time to cross safely.
- 8) *Example:*

```
## ---- Code ---- ##
while True:
    GP13.setPin(1)
    while not ((not GP12.checkPin(Pull.UP))):
        pass
    time.sleep(1)
    GP13.setPin(0)
    GP14.setPin(1)
    time.sleep(3)
    GP14.setPin(0)
    GP15.setPin(1)
    time.sleep(5) # Changed from 10 seconds to 5 seconds
    GP15.setPin(0)
```

Explanation:

This change shortens the time the red light stays on from 10 seconds to 5 seconds.