TRAFFIC LIGHT CONTROL SYSTEM

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INTRODUCTION

Explanation of problem statement

1. **Generate a Random Time**

   A random number between **1 and 1000 seconds** is chosen.

2. **Determine the Light Cycle**

   The total cycle duration is **130 seconds** (Red: 60s, Yellow: 10s, Green: 60s).

3. **Decide Which Light is On**

   Red is on for the first **60 seconds** → **"Stop!"**

   Yellow is on from **60 to 70 seconds** → **"Caution!"**

   Green is on from **70 to 130 seconds** → **"Go!"**

4. **Print the Result**

   Display the random timer value.

Approach to solve problem

1. **Generating a Random Timer**

   A random number is selected between **1 and 200 seconds**.

   This represents a randomly chosen moment in time to check the traffic light status.

2. **Defining the Traffic Light Cycle**

   The total cycle duration is calculated as: 60 (Red)+10 (Yellow)+60 (Green)=130 seconds

3. **Determining the Light State**

   Red Light (0-59 seconds in cycle)

   If time < 60, the **red light is on**, and the program prints "Stop!".

   Yellow Light (60-69 seconds in cycle)

   If time< 70, the **yellow light is on**, and it prints "Caution!".

   Green Light (70-129 seconds in cycle)

   Otherwise, the **green light is on**, and it prints "Go!".

4. **Displaying the Output**

   The program prints the randomly generated timer value.

   It then prints the current light colour and an appropriate message.

CODE

```
import random


def traffic_light_system():
    timer = random.randint(1, 200)  # Random timer between 1 and 200 seconds
    print(f"Timer set to: {timer} seconds")

    cycle_time = 60 + 10 + 60  # Total cycle time (Red + Yellow + Green)
    time_in_cycle = timer % cycle_time  # Time within the current cycle

    if time_in_cycle < 60:
        light = "Red"
        message = "Stop! The red light is on."
    elif time_in_cycle < 70:
        light = "Yellow"
        message = "Caution! The yellow light is on."
    else:
        light = "Green"
        message = "Go! The green light is on."

    print(f"After {timer} seconds, the light is: {light}")
    print(message)
traffic_light_system()
```

OUTPUT

```
Timer set to: 57 seconds
After 57 seconds, the light is: Red
Stop! The red light is on.
```

REFERENCE

ChatGPT & Wikipedia