KIET Group of Institutions
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Introduction to AI

Report

On

Traffic Light Control System

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Introduction

The Traffic Light Control System generates a random integer as time till which the program runs and returns the last state whether RED, YELLOW or GREEN.
The program uses two libraries of python that are time and random, from random we use randint method to generate an integer between a range (here 100 to 696 seconds), and then start the states from RED to GREEN until we reach the randomly generated time.

Methodology

The approach to solve this problem starts with generating a random number as time in seconds between the range 100 to 696. And then starting the Traffic Light Control from RED to GREEN until we reach the generated time.
And returning the number of states passed and the last state.

Code

```
import time  # Importing time module to simulate delay in light changes
import random  # Importing random module to generate random numbers

# Function to simulate traffic light system
def traffic_light_system():
    state_count = 0  # Counter to track the number of states passed
    random_number = random.randint(100, 696)  # Generate a random number
within the range 100 to 696
    print("The geenrated time is", random_number, "seconds")
    last_state = ""  # Variable to store the last state
    total_time = 0  # Variable to track total time elapsed

    while state_count < random_number:  # Run loop until the random number
is reached

        # RED Light - Stop
        print("RED Light - STOP")
        last_state = "RED - STOP"
        red_time = 40  # Time taken for RED light
        total_time += red_time
        if total_time >= random_number:
            break
        time.sleep(5)  # Simulate waiting time
        state_count += 1

        # YELLOW Light - Get Ready
        print("YELLOW Light - GET READY")
        last_state = "YELLOW - GET READY"
        yellow_time = 15  # Time taken for YELLOW light
        total_time += yellow_time
        if total_time >= random_number:
            break
        time.sleep(2)  # Simulate waiting time
        state_count += 1

        # GREEN Light - Go
        print("GREEN Light - GO")
        last_state = "GREEN - GO"
```

```
        green_time = 40  # Time taken for GREEN light
        total_time += green_time
        if total_time >= random_number:
            break
        time.sleep(5)  # Simulate waiting time
        state_count += 1

    time_left = max(0, random_number - total_time)  # Calculate remaining
time

    return last_state, state_count, time_left

# Call the function to start traffic light simulation
last_state, states_passed, time_left = traffic_light_system()
print(f"Last State: {last_state}")
print(f"Number of States Passed: {states_passed}")
```

Code Output

```
The geenrated time is  393 seconds
RED Light - STOP
YELLOW Light - GET READY
GREEN Light - GO
RED Light - STOP
YELLOW Light - GET READY
GREEN Light - GO
RED Light - STOP
YELLOW Light - GET READY
GREEN Light - GO
RED Light - STOP
YELLOW Light - GET READY
GREEN Light - GO
RED Light - STOP
Last State: RED - STOP
Number of States Passed: 12
```

Credits

- Google Colab
- Google Search
- Python.org