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Subject : Problem Solving Using Python

Batch : 4

Project 1: Traffic Light Simulation using Python

1. Project Title

Traffic Light Simulation using Python

2. Problem Statement

To design and implement a traffic light simulation that cycles through **Red → Green → Yellow → Red** using loops and conditional statements. The program should continuously display the current light until the user stops execution.

3. Objectives

- To simulate real-world traffic light behavior.
- To practice loops and conditional statements.
- To understand time delays in Python.
- To implement a menu-driven approach for starting/stopping the simulation.

4. Tools Used

- Python 3
- VS Code / IDLE

5. Description

This project simulates a traffic light system. The lights change in a loop with a time delay for each state. The simulation continues until the user chooses to stop.

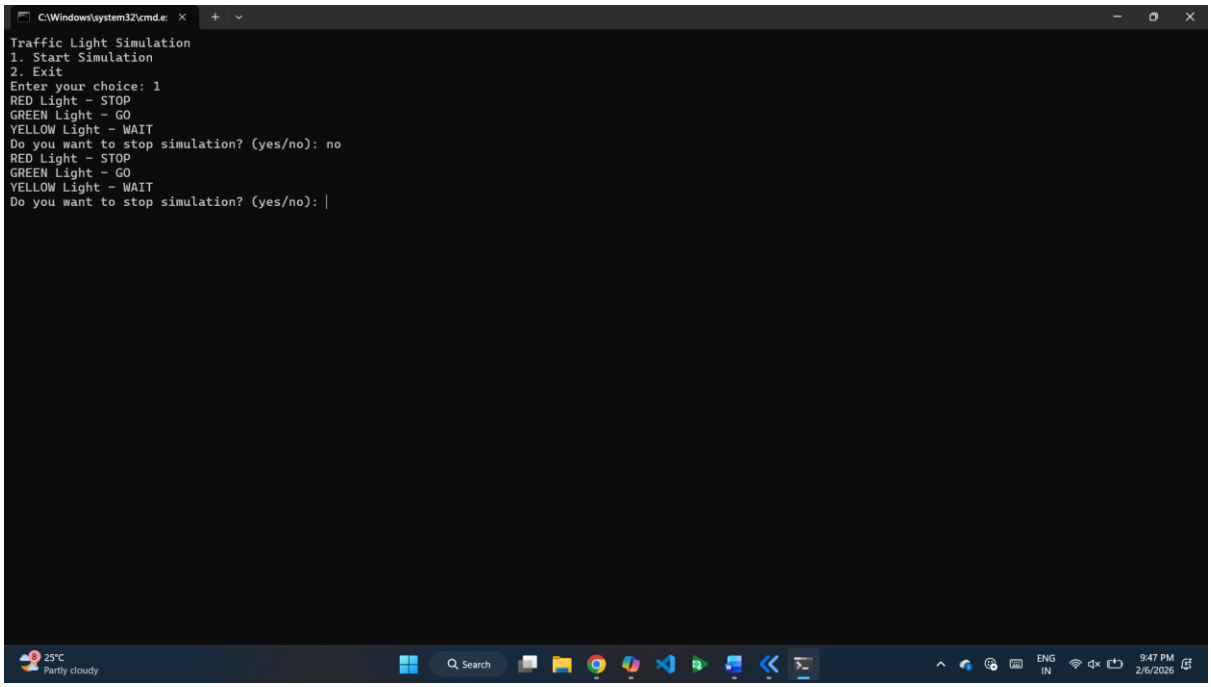
6. Algorithm

1. Import time module.
2. Create a loop to cycle through lights.
3. Display "Red", wait for 3 seconds.
4. Display "Green", wait for 3 seconds.
5. Display "Yellow", wait for 2 seconds.
6. Repeat steps 3–5 until user exits.

7. Program (Python Code)

```
import time

while True:
    print("Traffic Light Simulation")
    print("1. Start Simulation")
    print("2. Exit")

    choice = int(input("Enter your choice: "))

    if choice == 1:
        while True:
            print("RED Light - STOP")
            time.sleep(3)

            print("GREEN Light - GO")
            time.sleep(3)

            print("YELLOW Light - WAIT")
            time.sleep(2)

            # Ask if user wants to stop after one cycle
            stop = input("Do you want to stop simulation? (yes/no): ")
            if stop.lower() == "yes":
                break

    elif choice == 2:
        print("Exiting Traffic Light Simulation. Goodbye!")
        break

    else:
        print("Invalid choice. Try again.")
```

8.Sample Output



9. Result

The traffic light simulation successfully cycles through Red, Green, and Yellow lights using loops and conditional statements.

10. Conclusion

This project demonstrates how Python loops and conditions can be used to simulate real-world systems like traffic lights, making it a practical learning exercise.
