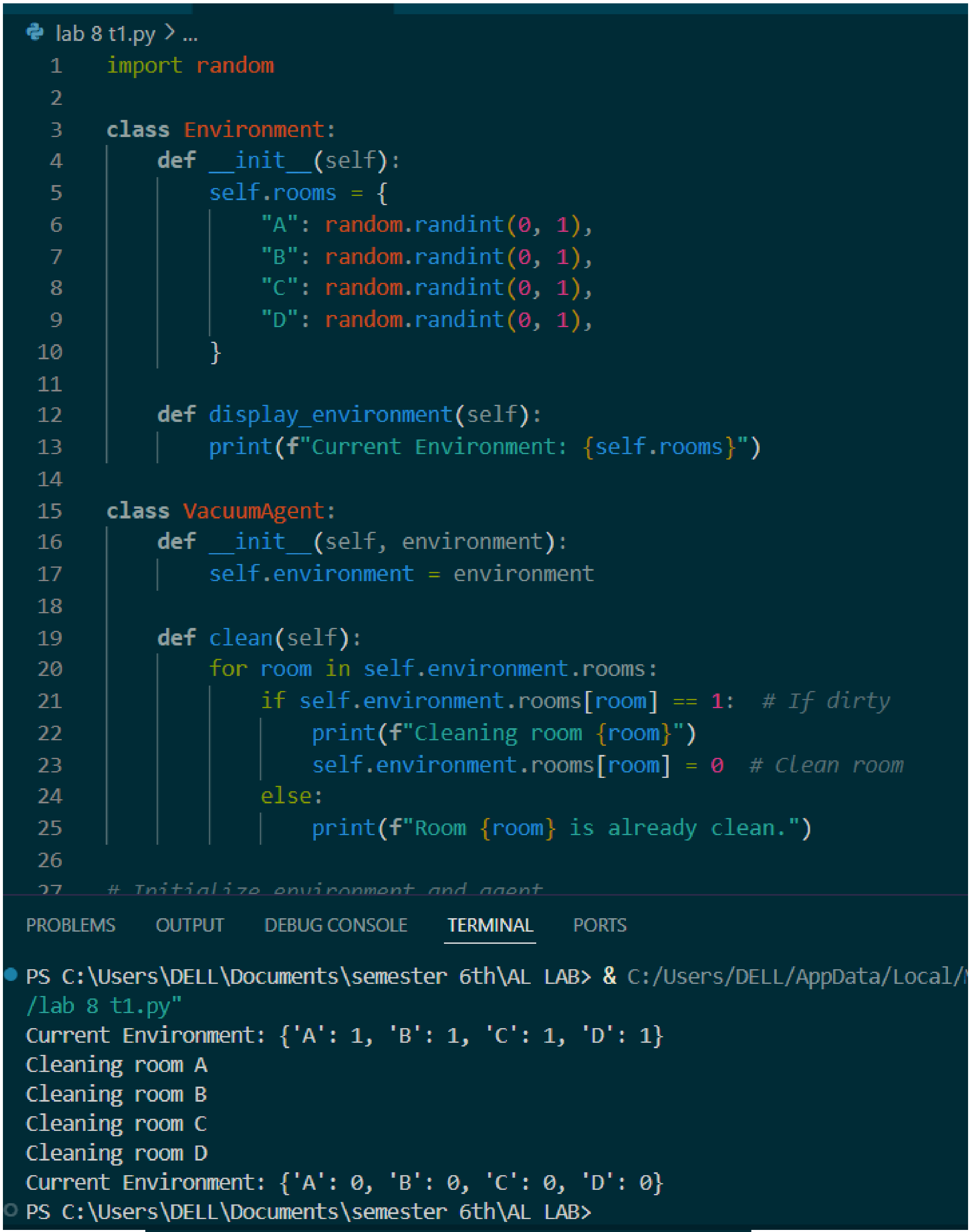
Faculty of Computing

RIPHAH
FACULTY OF
COMPUTING

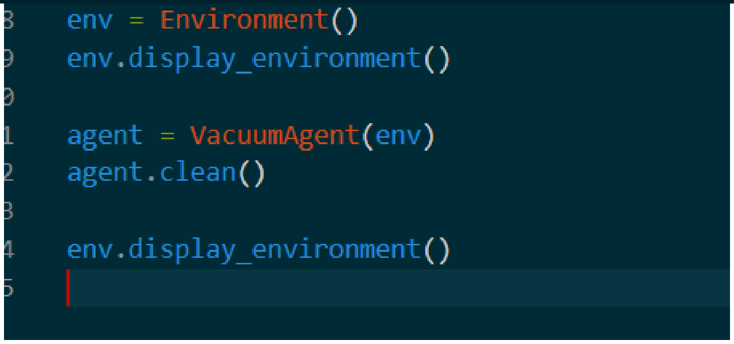
[Computer Communications & Network]

Lab No 8 Tasks

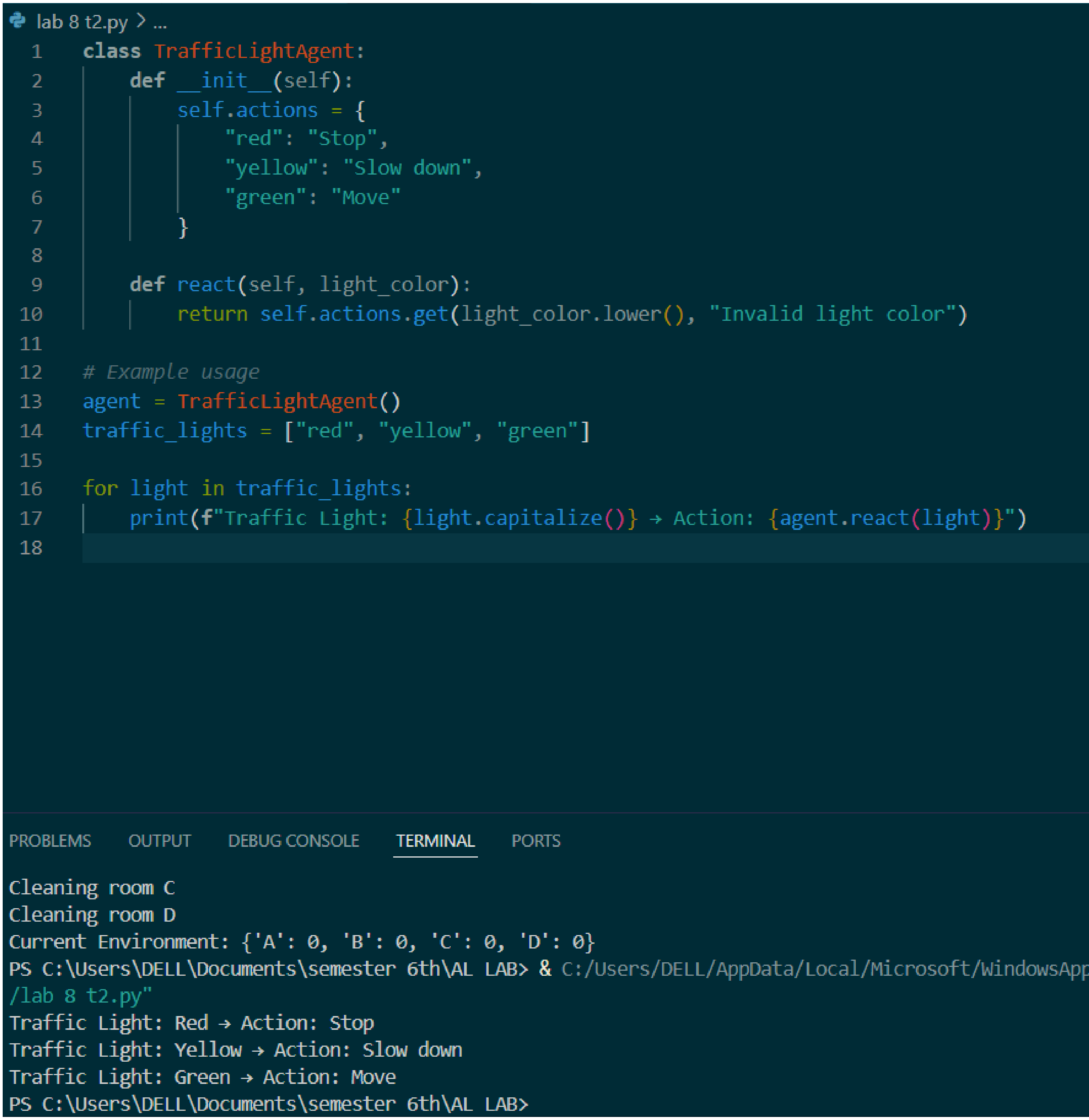


```python
import random

class Environment:
    def __init__(self):
        self.rooms = {
            "A": random.randint(0, 1),
            "B": random.randint(0, 1),
            "C": random.randint(0, 1),
            "D": random.randint(0, 1),
        }

    def display_environment(self):
        print(f"Current Environment: {self.rooms}")

class VacuumAgent:
    def __init__(self, environment):
        self.environment = environment

    def clean(self):
        for room in self.environment.rooms:
            if self.environment.rooms[room] == 1:  # If dirty
                print(f"Cleaning room {room}")
                self.environment.rooms[room] = 0  # Clean room
            else:
                print(f"Room {room} is already clean.")

# Initialize environment and agent
```

```
PS C:\Users\DELL\Documents\semester 6th\AL LAB> & C:/Users/DELL/AppData/Local/
/lab 8 t1.py"
Current Environment: {'A': 1, 'B': 1, 'C': 1, 'D': 1}
Cleaning room A
Cleaning room B
Cleaning room C
Cleaning room D
Current Environment: {'A': 0, 'B': 0, 'C': 0, 'D': 0}
PS C:\Users\DELL\Documents\semester 6th\AL LAB>
```

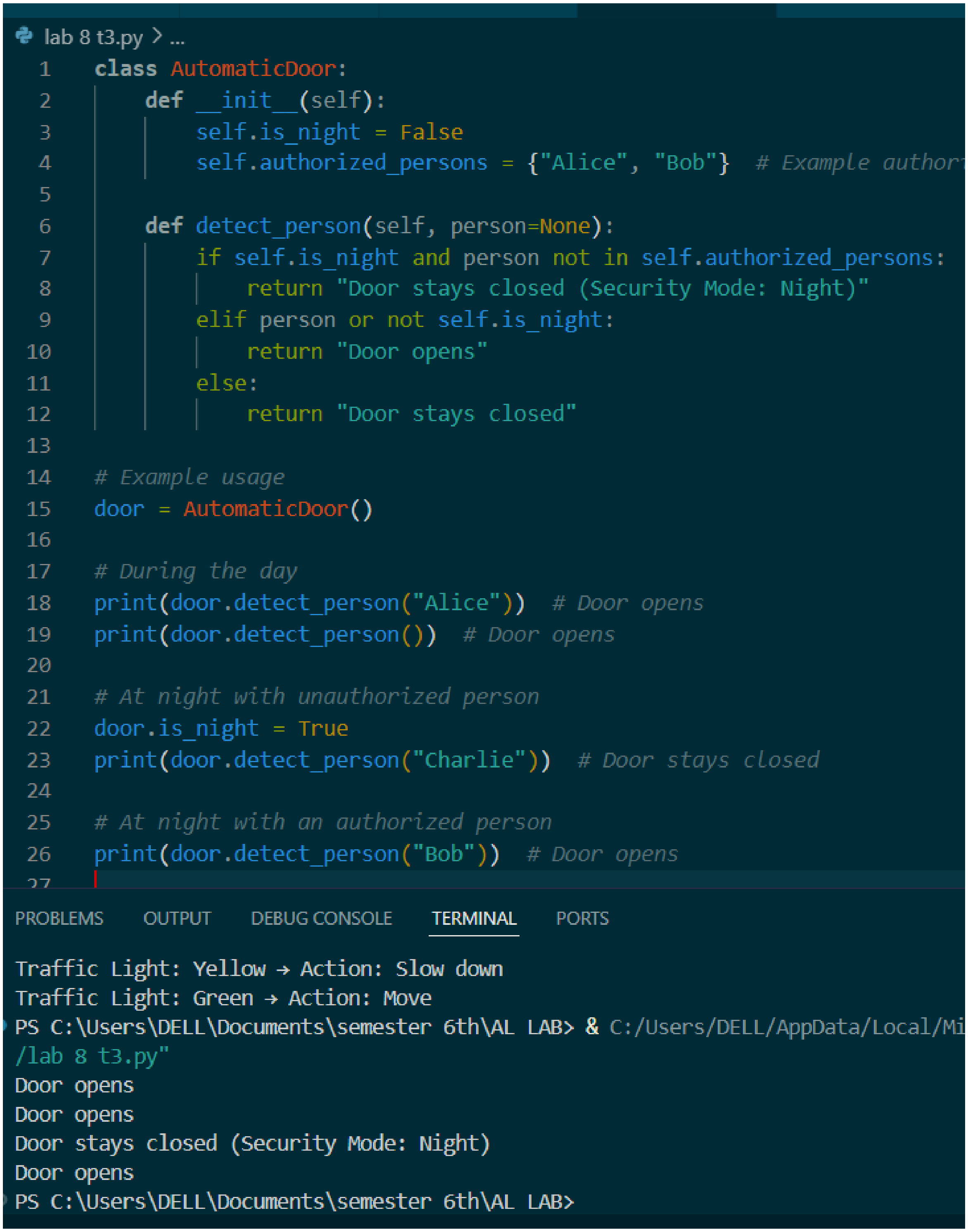


```python
env = Environment()
env.display_environment()

agent = VacuumAgent(env)
agent.clean()

env.display_environment()
```



```python
class TrafficLightAgent:
    def __init__(self):
        self.actions = {
            "red": "Stop",
            "yellow": "Slow down",
            "green": "Move"
        }

    def react(self, light_color):
        return self.actions.get(light_color.lower(), "Invalid light color")

# Example usage
agent = TrafficLightAgent()
traffic_lights = ["red", "yellow", "green"]

for light in traffic_lights:
    print(f"Traffic Light: {light.capitalize()} → Action: {agent.react(light)}")

```

```
Cleaning room C
Cleaning room D
Current Environment: {'A': 0, 'B': 0, 'C': 0, 'D': 0}
PS C:\Users\DELL\Documents\semester 6th\AL LAB> & C:/Users/DELL/AppData/Local/Microsoft/WindowsApp
/lab 8 t2.py"
Traffic Light: Red → Action: Stop
Traffic Light: Yellow → Action: Slow down
Traffic Light: Green → Action: Move
PS C:\Users\DELL\Documents\semester 6th\AL LAB>
```



```python
class AutomaticDoor:
    def __init__(self):
        self.is_night = False
        self.authorized_persons = {"Alice", "Bob"}  # Example author

    def detect_person(self, person=None):
        if self.is_night and person not in self.authorized_persons:
            return "Door stays closed (Security Mode: Night)"
        elif person or not self.is_night:
            return "Door opens"
        else:
            return "Door stays closed"

# Example usage
door = AutomaticDoor()

# During the day
print(door.detect_person("Alice"))  # Door opens
print(door.detect_person())  # Door opens

# At night with unauthorized person
door.is_night = True
print(door.detect_person("Charlie"))  # Door stays closed

# At night with an authorized person
print(door.detect_person("Bob"))  # Door opens
```

```
Traffic Light: Yellow → Action: Slow down
Traffic Light: Green → Action: Move
PS C:\Users\DELL\Documents\semester 6th\AL LAB> & C:/Users/DELL/AppData/Local/Mi
/lab 8 t3.py"
Door opens
Door opens
Door stays closed (Security Mode: Night)
Door opens
PS C:\Users\DELL\Documents\semester 6th\AL LAB>
```