RIPHAH
INTERNATIONAL
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Lab #08

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Subject: AI Lab

Batch: BSCS 6th Semester

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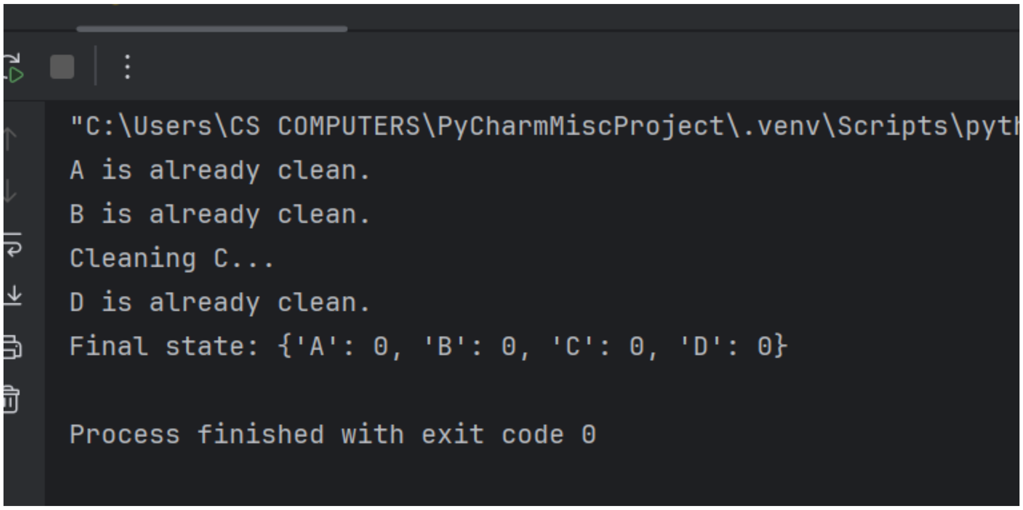
Task 1

Solution:

```
import random
class VacuumEnvironment:
    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 clean(self, room):
        if self.rooms[room] == 1:
            print(f"Cleaning {room}...")
            self.rooms[room] = 0
        else:
            print(f"{room} is already clean.")

    def run_agent(self):
        for room in self.rooms:
            self.clean(room)
        print("Final state:", self.rooms)
```

```
vacuum = VacuumEnvironment()

vacuum.run_agent()
```

Output



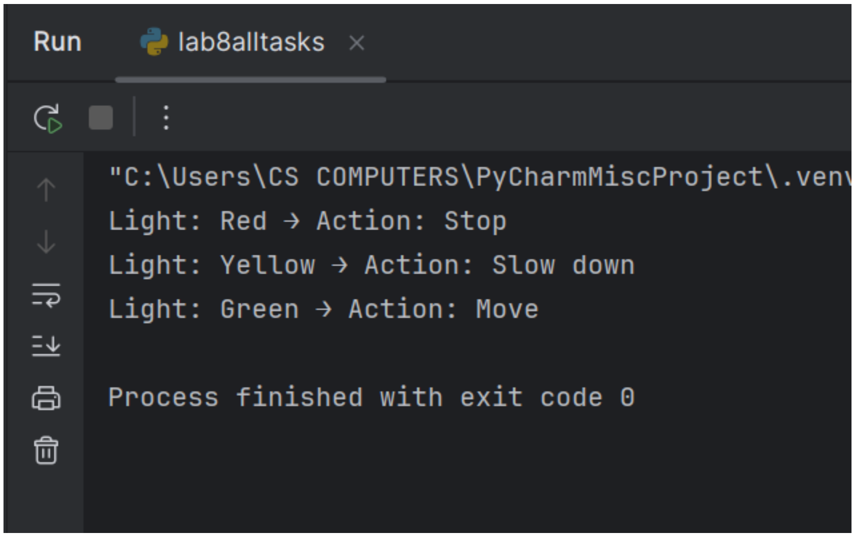
```
"C:\Users\CS COMPUTERS\PyCharmMiscProject\.venv\Scripts\pyth
A is already clean.
B is already clean.
Cleaning C...
D is already clean.
Final state: {'A': 0, 'B': 0, 'C': 0, 'D': 0}

Process finished with exit code 0
```

Task 2

Solution:

```
class TrafficLightAgent:

    def act(self, light_color):

        actions = {"red": "Stop", "yellow": "Slow down", "green": "Move"}

        return actions.get(light_color.lower(), "Invalid color")


traffic_agent = TrafficLightAgent()

for color in ["Red", "Yellow", "Green"]:

    print(f"Light: {color} → Action: {traffic_agent.act(color)}")
```

Output



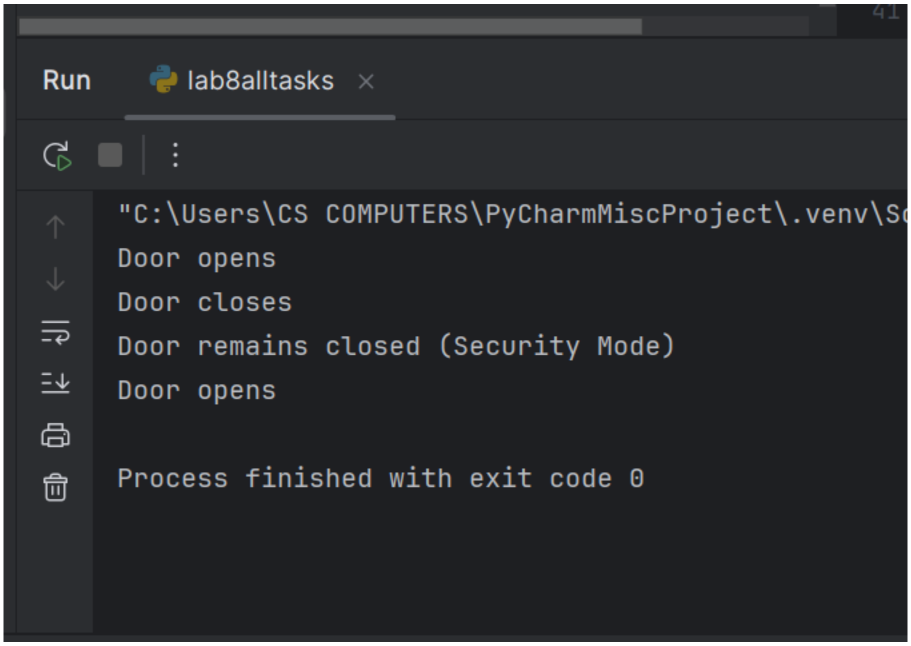
```
"C:\Users\CS COMPUTERS\PyCharmMiscProject\.ven
Light: Red → Action: Stop
Light: Yellow → Action: Slow down
Light: Green → Action: Move

Process finished with exit code 0
```

Task 3

Solution:

```
class AutomaticDoor:
    def __init__(self):
        self.night_mode = False


    def detect_person(self, person_detected, authorized=False):
        if self.night_mode and not authorized:
            return "Door remains closed (Security Mode)"
        return "Door opens" if person_detected else "Door closes"


door = AutomaticDoor()
print(door.detect_person(True))  # Door opens
print(door.detect_person(False))  # Door closes


# Activate night mode

door.night_mode = True

print(door.detect_person(True, authorized=False))  # Door remains closed

print(door.detect_person(True, authorized=True))  # Door opens
```

Output:



```
"C:\Users\CS COMPUTERS\PyCharmMiscProject\.venv\S
Door opens
Door closes
Door remains closed (Security Mode)
Door opens

Process finished with exit code 0
```