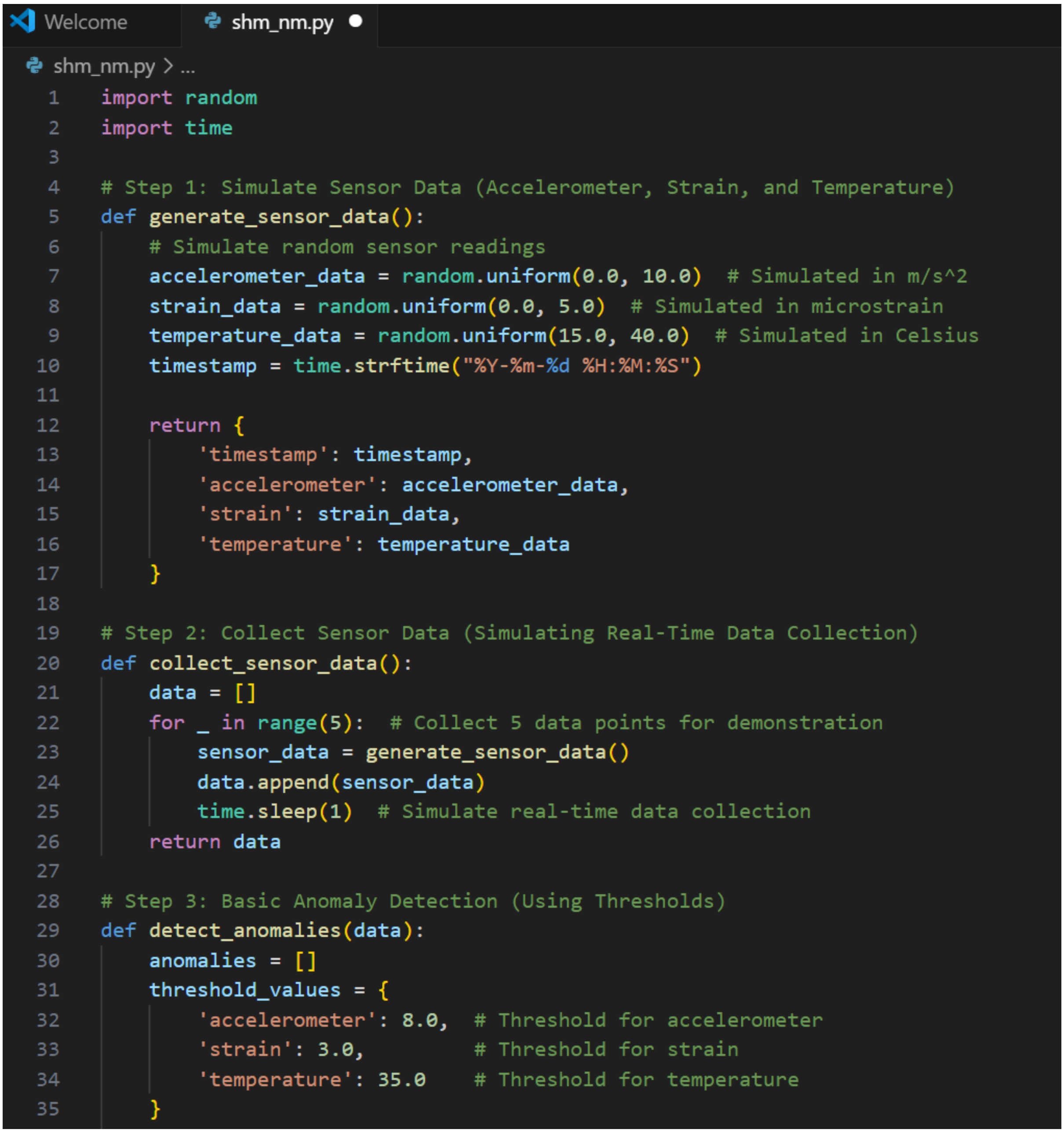
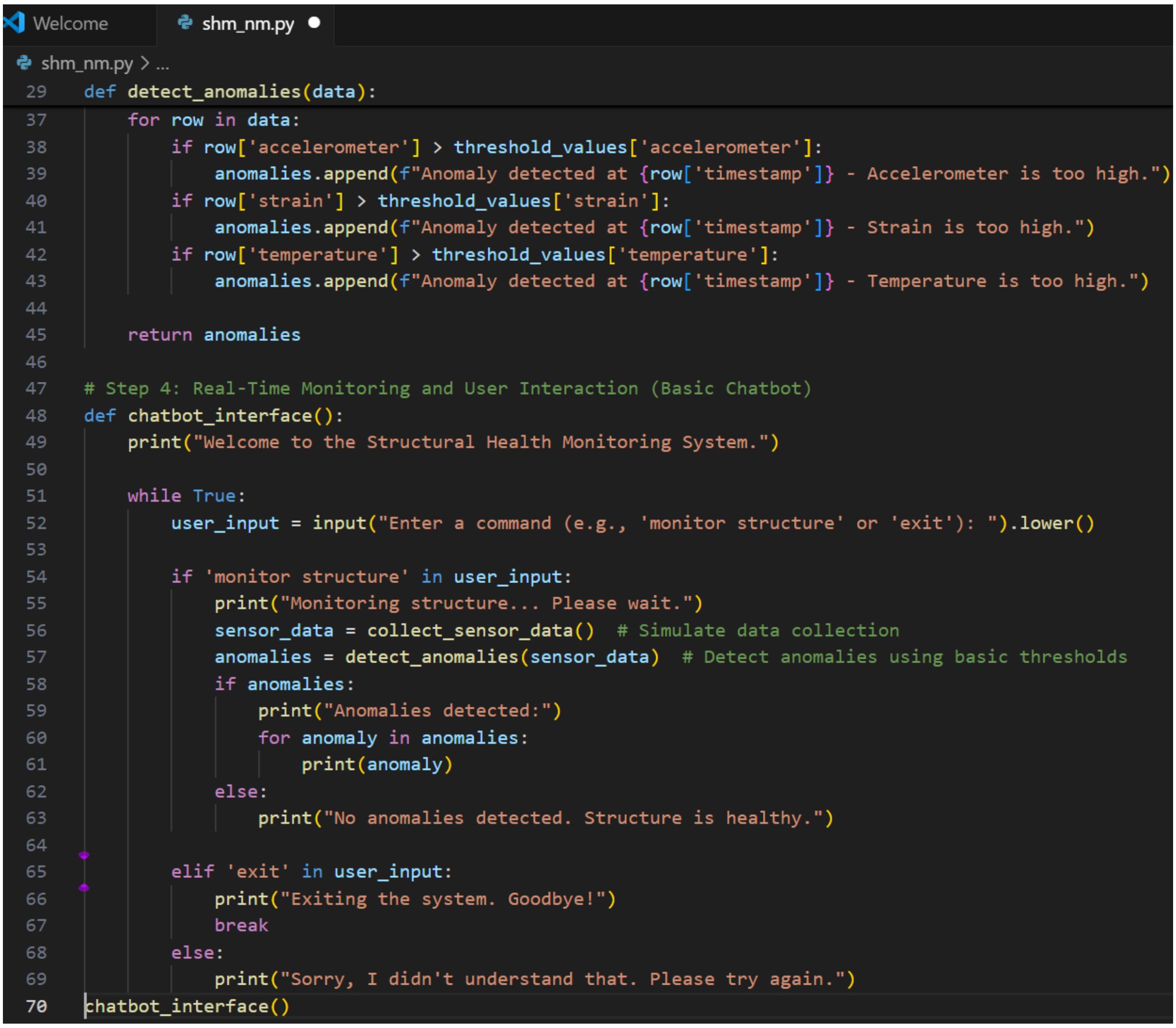
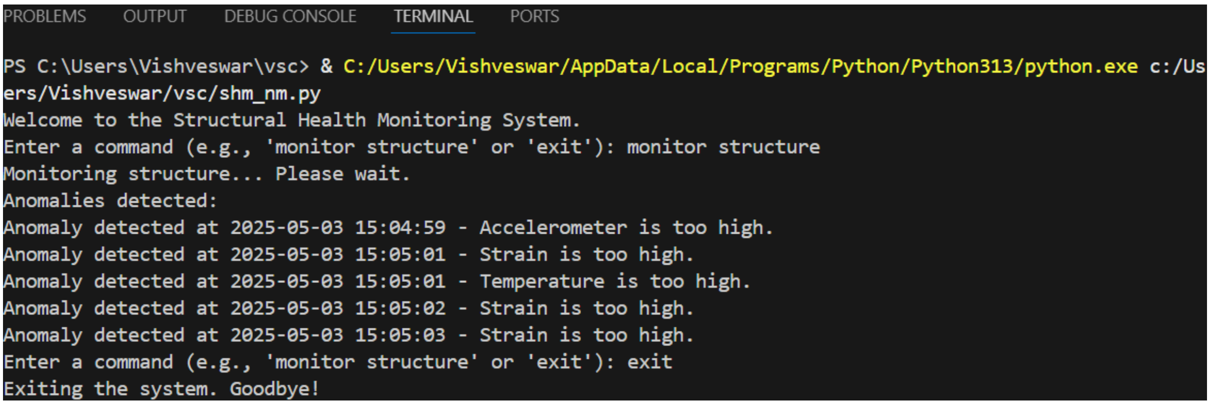


```python
import random
import time

# Step 1: Simulate Sensor Data (Accelerometer, Strain, and Temperature)
def generate_sensor_data():
    # Simulate random sensor readings
    accelerometer_data = random.uniform(0.0, 10.0)  # Simulated in m/s^2
    strain_data = random.uniform(0.0, 5.0)  # Simulated in microstrain
    temperature_data = random.uniform(15.0, 40.0)  # Simulated in Celsius
    timestamp = time.strftime("%Y-%m-%d %H:%M:%S")

    return {
        'timestamp': timestamp,
        'accelerometer': accelerometer_data,
        'strain': strain_data,
        'temperature': temperature_data
    }

# Step 2: Collect Sensor Data (Simulating Real-Time Data Collection)
def collect_sensor_data():
    data = []
    for _ in range(5):  # Collect 5 data points for demonstration
        sensor_data = generate_sensor_data()
        data.append(sensor_data)
        time.sleep(1)  # Simulate real-time data collection
    return data

# Step 3: Basic Anomaly Detection (Using Thresholds)
def detect_anomalies(data):
    anomalies = []
    threshold_values = {
        'accelerometer': 8.0,  # Threshold for accelerometer
        'strain': 3.0,         # Threshold for strain
        'temperature': 35.0    # Threshold for temperature
    }
```



```python
def detect_anomalies(data):
    for row in data:
        if row['accelerometer'] > threshold_values['accelerometer']:
            anomalies.append(f"Anomaly detected at {row['timestamp']} - Accelerometer is too high.")
        if row['strain'] > threshold_values['strain']:
            anomalies.append(f"Anomaly detected at {row['timestamp']} - Strain is too high.")
        if row['temperature'] > threshold_values['temperature']:
            anomalies.append(f"Anomaly detected at {row['timestamp']} - Temperature is too high.")

    return anomalies

# Step 4: Real-Time Monitoring and User Interaction (Basic Chatbot)
def chatbot_interface():
    print("Welcome to the Structural Health Monitoring System.")

    while True:
        user_input = input("Enter a command (e.g., 'monitor structure' or 'exit'): ").lower()

        if 'monitor structure' in user_input:
            print("Monitoring structure... Please wait.")
            sensor_data = collect_sensor_data()  # Simulate data collection
            anomalies = detect_anomalies(sensor_data)  # Detect anomalies using basic thresholds
            if anomalies:
                print("Anomalies detected:")
                for anomaly in anomalies:
                    print(anomaly)
            else:
                print("No anomalies detected. Structure is healthy.")

        elif 'exit' in user_input:
            print("Exiting the system. Goodbye!")
            break
        else:
            print("Sorry, I didn't understand that. Please try again.")
chatbot_interface()
```

OUTPUT



```
PS C:\Users\Vishveswar\vsc> & C:/Users/Vishveswar/AppData/Local/Programs/Python/Python313/python.exe c:/Us
ers/Vishveswar/vsc/shm_nm.py
Welcome to the Structural Health Monitoring System.
Enter a command (e.g., 'monitor structure' or 'exit'): monitor structure
Monitoring structure... Please wait.
Anomalies detected:
Anomaly detected at 2025-05-03 15:04:59 - Accelerometer is too high.
Anomaly detected at 2025-05-03 15:05:01 - Strain is too high.
Anomaly detected at 2025-05-03 15:05:01 - Temperature is too high.
Anomaly detected at 2025-05-03 15:05:02 - Strain is too high.
Anomaly detected at 2025-05-03 15:05:03 - Strain is too high.
Enter a command (e.g., 'monitor structure' or 'exit'): exit
Exiting the system. Goodbye!
```