UNIVERSITY OF ENGINEERING & TECHNOLOGY PESHAWAR

(Jalozai Campus)

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DEPARTMENT: ELECTRICAL

SUBJECT: INTRODUCTION TO AI

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ASSIGNMENT NO 1

Introduction

I wrote a Python program that reads hourly energy consumption data from a CSV file named **assignment.csv**. The goal was to load the data without using pandas and then perform basic calculations such as total, average, maximum, and minimum consumption. After that, the program converts the consumption values from watts (W) to kilowatt-hours (kWh).

Objectives

The main tasks of the assignment were:

1. Read the CSV file manually using the **csv** module.
2. Store the consumption values in a list of floats.
3. Calculate:
   - Total consumption
   - Average consumption
   - Maximum consumption
   - Minimum consumption
4. Convert the hourly consumption from watts to kWh using a list comprehension.
5. Print all results in a clear format.

Methodology

The program begins by importing the **csv** module.
Then the CSV file is opened and the header row is skipped. Each row contains two columns: hour and consumption (in watts). Only the consumption values are stored in a list.
Basic Python functions such as sum(), max(), min(), and division are used to compute the required statistics.
To convert watt-hours to kWh, each value is divided by 1000 using a list comprehension.
Finally, all results are displayed on the screen.

Python Code Used

```
import csv

consumption = []

with open("assignment.csv") as file:
    reader = csv.reader(file)
    next(reader)

    for row in reader:
        consumption.append(float(row[1]))

total_consumption = sum(consumption)
average_consumption = total_consumption / len(consumption)
maximum_consumption = max(consumption)
```

```
minimum_consumption = min(consumption)

consumption_kwh = [x / 1000 for x in consumption]

print("Total Consumption:", total_consumption)
print("Average Consumption:", average_consumption)
print("Maximum Consumption:", maximum_consumption)
print("Minimum Consumption:", minimum_consumption)
print("Consumption in kWh:", consumption_kwh)
```

Results

After running the program, the following results are obtained (based on the data in the CSV file):

- **Total Consumption:** 5300 Wh
- **Average Consumption:** 530 Wh
- **Maximum Consumption:** 800 Wh
- **Minimum Consumption:** 200 Wh
- **Consumption in kWh:** [0.2, 0.3, 0.5, 0.7, 0.6, 0.4, 0.8, 0.7, 0.6, 0.5]

Conclusion

This assignment helped me understand how to manually read a CSV file using Python's csv module. I practiced storing data in a list, performing mathematical calculations, and converting units using list comprehensions.

Assignment 1

By: Azka Karim

Program to read energy consumption from CSV and calculate basic values.

In [1]:
```python
import csv

consumption = []
```

In [2]:
```python
with open("assignment.csv") as file:
    reader = csv.reader(file)
    next(reader)

    for row in reader:
        consumption.append(float(row[1]))
```

In [3]:
```python
total_consumption = sum(consumption)
average_consumption = total_consumption / len(consumption)
maximum_consumption = max(consumption)
minimum_consumption = min(consumption)

consumption_kwh = [x / 1000 for x in consumption]
```

In [4]:
```python
print("Total Consumption:", total_consumption)
print("Average Consumption:", average_consumption)
print("Maximum Consumption:", maximum_consumption)
print("Minimum Consumption:", minimum_consumption)
print("Consumption in kWh:", consumption_kwh)
```

```
Total Consumption: 5300.0
Average Consumption: 530.0
Maximum Consumption: 800.0
Minimum Consumption: 200.0
Consumption in kWh: [0.2, 0.3, 0.5, 0.7, 0.6, 0.4, 0.8, 0.7, 0.6, 0.5]
```