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DEPARTMENT: ELECTRICAL

SUBJECT: INTRODUCTION TO AI

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ASSIGNMENT NO 2

Introduction

The goal is to manually read a CSV file using Python and the csv module. The file contains three columns: **Day**, **Hour**, and **Consumption** (in watts).
We needed to store each column separately, then group the consumption values:

- First by **hour**,
- Then by **day**.

After grouping, the program calculates averages, peak values, and totals.

Objectives

1. Load the CSV file using the csv module

- Store each column into separate lists:
  - days = []
  - hours = []
  - consumptions = []

2. Group consumption by hour

Create a dictionary like:

```
{ 1: [200, 700, 800, 500],
  2: [300, 600, 700, 400],
  3: [500, 400, 600, 650] }
```

Then compute:

- Average consumption per hour
- Peak consumption per hour

3. Group consumption by day

Create a dictionary such as:

```
{ 7: [200,300,500,700,600,400],
  8: [800,700,600,500,400,650] }
```

Then compute:

- Total consumption per day
- Daily average consumption

Methodology

1. The CSV is opened using csv.reader.
2. The header row is skipped.

3. Each value of Day, Hour, and Consumption is extracted and stored in the three lists.
4. Two dictionaries are used:
    - One for grouping by hour
    - One for grouping by day
5. Basic Python functions (sum, max, division) are used to compute the statistics.
6. Results are printed in a clear and simple format.

Python Code Used

```
import csv
days = [ ]
hours = [ ]
consumptions = [ ]

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

    for row in reader:
        days.append(int(row[0]))
        hours.append(int(row[1]))
        consumptions.append(float(row[2]))

hour_groups = {}

for i in range(len(hours)):
    h = hours[i]
    c = consumptions[i]

    if h not in hour_groups:
        hour_groups[h] = []
    hour_groups[h].append(c)

# Compute hour-wise stats
print(" Consumption Grouped by Hour ")

for h in hour_groups:
    values = hour_groups[h]
    avg = sum(values) / len(values)
    peak = max(values)

    print("Hour:", h)
    print("  Values:", values)
    print("  Average:", avg)
    print("  Peak:", peak)
    print()

day_groups = {}

for i in range(len(days)):
```

```
    d = days[i]
    c = consumptions[i]

    if d not in day_groups:
        day_groups[d] = [ ]
    day_groups[d].append(c)

print("Consumption Grouped by Day ")

for d in day_groups:
    values = day_groups[d]
    total = sum(values)
    avg = total / len(values)

    print("Day:", d)
    print("  Values:", values)
    print("  Total:", total)
    print("  Average:", avg)
    print()
```

Results

Consumption Grouped by Hour

Hour	Values	Average	Peak
1	[200, 700, 800, 500]	550	800
2	[300, 600, 700, 400]	500	700
3	[500, 400, 600, 650]	537.5	650

Consumption Grouped by Day

Day	Values	Total	Average
7	[200,300,500,700,600,400]	2700	450
8	[800,700,600,500,400,650]	3650	608.33

Conclusion

This assignment helped me understand how to:

- Read CSV files manually without pandas
- Store columns in separate lists
- Perform manual "group by" operations
- Use dictionaries to organize data
- Calculate averages, totals, and peak values

Assignment 2

By: Azka Karim

This program groups consumption by hour and by day from a CSV file

and calculates averages and totals.

In [1]:
```
import csv

days = []
hours = []
consumptions = []
```

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

    for row in reader:
        days.append(int(row[0]))
        hours.append(int(row[1]))
        consumptions.append(float(row[2]))
```

In [4]:
```
hour_groups = {}

for i in range(len(hours)):
    h = hours[i]
    c = consumptions[i]

    if h not in hour_groups:
        hour_groups[h] = []
    hour_groups[h].append(c)
```

In [5]:
```
print("Consumption Grouped by Hour ")

for h in hour_groups:
    values = hour_groups[h]
    avg = sum(values) / len(values)
    peak = max(values)

    print("Hour:", h)
    print("  Values:", values)
    print("  Average:", avg)
    print("  Peak:", peak)
```

```
    print()
```

```
Consumption Grouped by Hour
Hour: 1
  Values: [200.0, 700.0, 800.0, 500.0]
  Average: 550.0
  Peak: 800.0

Hour: 2
  Values: [300.0, 600.0, 700.0, 400.0]
  Average: 500.0
  Peak: 700.0

Hour: 3
  Values: [500.0, 400.0, 600.0, 650.0]
  Average: 537.5
  Peak: 650.0
```

In [6]:
```
day_groups = {}

for i in range(len(days)):
    d = days[i]
    c = consumptions[i]

    if d not in day_groups:
        day_groups[d] = []
    day_groups[d].append(c)
```

In [7]:
```
print("Consumption Grouped by Day ")

for d in day_groups:
    values = day_groups[d]
    total = sum(values)
    avg = total / len(values)

    print("Day:", d)
    print("  Values:", values)
    print("  Total:", total)
    print("  Average:", avg)
    print()
```

```
Consumption Grouped by Day
Day: 7
  Values: [200.0, 300.0, 500.0, 700.0, 600.0, 400.0]
  Total: 2700.0
  Average: 450.0

Day: 8
  Values: [800.0, 700.0, 600.0, 500.0, 400.0, 650.0]
  Total: 3650.0
  Average: 608.3333333333334
```