	Marwadi University **Faculty of Engineering & Technology** **Department of Information and Communication Technology**
Subject: Programming With Python (01CT1309)	**Aim:** Practical based on Data Loading, Storage and File Formats
Experiment No: 22	**Date:** **Enrollment No: 92400133037**

Aim: Practical based on Data Loading, Storage and File Formats

IDE:

load, manipulate, and store data using Python (over reading and writing CSV, JSON, and Excel files)

Library Installation

pip install pandas openpyxl

Sample Data:

Create a folder for this experiment and add the following sample data files:

sample_data.csv (Name,Age,City

Alice,30,New York

Bob,25,Los Angeles

Charlie,35,Chicago)

sample_data.json ([

 {"Name": "David", "Age": 28, "City": "San Francisco"},

 {"Name": "Eve", "Age": 22, "City": "Seattle"}

])

sample_data.xlsx (you can create this using Excel with similar data**)**

Loading Data from CSV

Read the CSV file and perform basic data manipulation.

import pandas as pd

Load data from CSV

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```python
csv_file_path = 'sample_data.csv'

df_csv = pd.read_csv(csv_file_path)


# Display the DataFrame

print("CSV Data:")

print(df_csv)


# Basic data manipulation: Filter by age

filtered_data = df_csv[df_csv['Age'] > 30]

print("\nFiltered Data (Age > 30):")

print(filtered_data)
```

```python
lab22 > example1csv.py > ...
  1  import pandas as pd
  2  csv_file_path=r'G:\sem-3\python_lab\lab22\sample_data.csv'
  3  df_csv=pd.read_csv(csv_file_path)
  4  print("CSV Data:")
  5  print(df_csv)
  6
  7  filtered_data=df_csv[df_csv['Age']>30]
  8  print("\nFiltered Data (Age>30):")
  9  print(filtered_data)
 10
```

```
PROBLEMS    OUTPUT    DEBUG CONSOLE    TERMINAL
∨ TERMINAL
PS G:\sem-3\python_lab> python -u "g:\sem-3\python_lab\lab22\example1.py"
CSV Data:
      Name  Age         City
0    Alice   30     New York
1      Bob   25  Los Angeles
2  Charlie   35      Chicago

Filtered Data (Age>30):
      Name  Age     City
2  Charlie   35  Chicago
```

Loading Data from JSON

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Read the JSON file and manipulate the data.

Load data from JSON

json_file_path = 'sample_data.json'

df_json = pd.read_json(json_file_path)

Display the DataFrame

print("\nJSON Data:")

print(df_json)

Basic data manipulation: Find the average age

average_age = df_json['Age'].mean()

print("\nAverage Age:", average_age)

```
lab22 > 🐍 example2json.py > ...
  1   import pandas as pd
  2   json_file_path=r'G:\sem-3\python_lab\lab22\sample_data.json'
  3   df_json=pd.read_json(json_file_path)
  4
  5   print("\nJSON Data:")
  6   print(df_json)
  7
  8   average_age=df_json['Age'].mean()
  9   print("\nAverage Age:", average_age)
```

```
PROBLEMS   OUTPUT   DEBUG CONSOLE   TERMINAL
∨ TERMINAL

PS G:\sem-3\python_lab> python -u "g:\sem-3\python_lab\lab22\example2json.py"
JSON Data:
    Name  Age          City
0  David   28  San Francisco
1    Eve   22        Seattle

Average Age: 25.0
```

Loading Data from Excel

Read the Excel file and display its contents.

Load data from Excel

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excel_file_path = 'sample_data.xlsx'

df_excel = pd.read_excel(excel_file_path)

Display the DataFrame
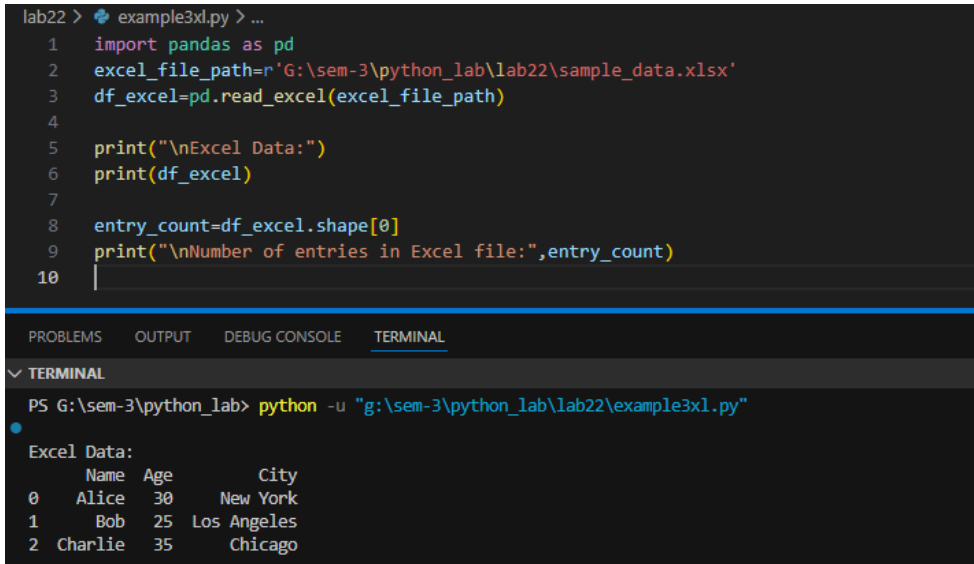
print("\nExcel Data:")

print(df_excel)

Basic data manipulation: Count the number of entries

entry_count = df_excel.shape[0]

print("\nNumber of entries in Excel file:", entry_count)

```
lab22 >  example3xl.py > ...
   1   import pandas as pd
   2   excel_file_path=r'G:\sem-3\python_lab\lab22\sample_data.xlsx'
   3   df_excel=pd.read_excel(excel_file_path)
   4
   5   print("\nExcel Data:")
   6   print(df_excel)
   7
   8   entry_count=df_excel.shape[0]
   9   print("\nNumber of entries in Excel file:",entry_count)
  10   |
```

```
PROBLEMS    OUTPUT    DEBUG CONSOLE    TERMINAL

∨ TERMINAL

PS G:\sem-3\python_lab> python -u "g:\sem-3\python_lab\lab22\example3xl.py"

Excel Data:
      Name  Age         City
0    Alice   30     New York
1      Bob   25  Los Angeles
2  Charlie   35      Chicago
```

Writing Data to Different Formats

Save manipulated DataFrames to new files in different formats.

Save filtered CSV data to a new file

filtered_data.to_csv('filtered_data.csv', index=False)

print("\nFiltered data saved to 'filtered_data.csv'.")

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Save DataFrame to a new JSON file

df_json.to_json('new_data.json', orient='records', lines=True)

print("JSON data saved to 'new_data.json'.")

Save DataFrame to a new Excel file

df_excel.to_excel('new_data.xlsx', index=False)

print("Excel data saved to 'new_data.xlsx'.")

Post Lab:

Write a code snippet to check the data types of each column in a DataFrame.

Write a code snippet that demonstrates how to fill missing values with the mean of a column.

```python
import pandas as pd
df=pd.read_csv(r"G:\sem-3\python_lab\lab22\sample_data.csv")
#a
print(df.dtypes)

#b
df['Age']=df['Age'].fillna(df['Age'].mean())
print(df)
```

```
3    NaN  28.0    Chicago
PS G:\sem-3\python_lab> python -u "g:\sem-3\python_lab\lab22\postLab.py"
Name      object
Age      float64
City      object
dtype: object
      Name   Age         City
0    Alice  30.0     New York
1      Bob  31.0  Los Angeles
2  Charlie  35.0          NaN
3      NaN  28.0      Chicago
```

GITHUB LINK:
https://github.com/Heer972005/Python_Lab