Department of Engineering Sciences and Technology,

Second Year Btech in Computer Science

Project Based Learning-Python

Assignment - 14

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Problem statement : **Write a program to create a DataFrame from a dictionary of lists. Use methods like head(), tail(), info(), and describe() to explore and summarize the DataFrame.**

Pre-requisites: Install the Pandas library:

```
pip install pandas
```

Basic knowledge of Python dictionaries and Pandas DataFrames.

Code:

```
# Import Pandas

import pandas as pd



# Create a dictionary of lists

data = {

   "Name": ["Alice", "Bob", "Charlie", "David", "Eve"],

   "Age": [25, 30, 35, 40, 28],

   "Score": [85, 90, 95, 88, 92]

}
```

```
# Create a DataFrame from the dictionary

df = pd.DataFrame(data)


# Display the first few rows of the DataFrame

print("First few rows of the DataFrame:")

print(df.head())


# Display the last few rows of the DataFrame

print("\nLast few rows of the DataFrame:")

print(df.tail())


# Display information about the DataFrame

print("\nDataFrame Information:")

print(df.info())


# Display basic statistics for numerical columns

print("\nBasic Statistics:")

print(df.describe())
```

Explanation :

Create a Dictionary of Lists:

- **A dictionary `data` is defined with keys as column names (`Name`, `Age`, `Score`) and values as lists of data.**

Create a DataFrame:

- **`pd.DataFrame(data)`: Converts the dictionary into a Pandas DataFrame.**

Explore the DataFrame:

- **`df.head()`: Displays the first 5 rows of the DataFrame.**

- **`df.tail()`: Displays the last 5 rows of the DataFrame.**
- **`df.info()`: Provides details about the DataFrame, such as column names, data types, and non-null counts.**
- **`df.describe()`: Computes summary statistics (e.g., mean, standard deviation) for numeric columns.**

Output:

First few rows of the DataFrame:

```
      Name  Age  Score
0    Alice   25     85
1      Bob   30     90
2  Charlie   35     95
3    David   40     88
4      Eve   28     92
```

Last few rows of the DataFrame:

```
      Name  Age  Score
0    Alice   25     85
1      Bob   30     90
2  Charlie   35     95
3    David   40     88
4      Eve   28     92
```

DataFrame Information:

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 5 entries, 0 to 4
Data columns (total 3 columns):
 #   Column  Non-Null Count  Dtype
---  ------  --------------  -----
 0   Name    5 non-null      object
 1   Age     5 non-null      int64
 2   Score   5 non-null      int64
dtypes: int64(2), object(1)
```

memory usage: 248.0 bytes

Basic Statistics:

	Age	Score
count	5.000000	5.000000
mean	31.600000	90.000000
std	6.295277	4.183300
min	25.000000	85.000000
25%	28.000000	88.000000
50%	30.000000	90.000000
75%	35.000000	92.000000
max	40.000000	95.000000

Output Explained:

- The program demonstrates creating a Pandas DataFrame from a dictionary of lists.
- Methods such as `head()`, `tail()`, `info()`, and `describe()` are used for data exploration and summarization.
- This approach can be extended to work with larger datasets or more complex data structures.