Thapar Institute of Engineering and Technology, Patiala

Department of Mechanical Engineering,

Python Programming (URA302), Dr. Rohit Kumar Singla

Work Sheet 6: Pandas Basics

Question 1: Pandas Basics

1.1 **Importing Pandas**

Write the command to import the Pandas library and check its version.

1.2 **Creating a DataFrame**

Create a simple DataFrame using the following data:

Name	Age	City
Alice	25	New York
Bob	30	Los Angeles
Charlie	35	Chicago

Print the DataFrame.

Question 2: Pandas Series

2.1 **Creating a Series**

Create a Pandas Series from the list [100, 200, 300, 400, 500].

Print the Series.

2.2 **Accessing Elements in a Series**

From the Series created in Question 2.1, access the second and fourth elements and print them.

2.3 **Series Operations**

Create a second Series S2 with values [10, 20, 30, 40, 50].

Perform element-wise addition between the two Series (S1 from 2.1 and S2) and print the result.

Question 3: DataFrame Basics

3.1 **DataFrame Column Access**

Using the DataFrame created in Question 1.2, print only the 'Name' and 'City' columns.

3.2 **Adding a New Column**

Add a new column Salary to the DataFrame in Question 1.2 with the following values: [50000, 60000, 70000].

Print the updated DataFrame.

3.3 **Basic Statistics on DataFrames**

Using the updated DataFrame, calculate and print:

- The average Age
- The total sum of Salary

Question 4: Filtering and Indexing

4.1 **Conditional Filtering**

Filter the DataFrame from Question 3.2 to display rows where the Age is greater than 28.

Print the filtered DataFrame.

4.2 **Setting and Resetting Index**

Set the Name column as the index of the DataFrame and print the updated DataFrame.

Then reset the index to the default and print the DataFrame again.

Question 5: Working with CSV Data

5.1 **Reading a CSV File**

Assume you have a CSV file called employees.csv with the following content:

Name, Department, Salary

John, Sales, 50000

Jane, Marketing, 60000

Emily, HR, 55000

Write the code to read this CSV file into a Pandas DataFrame and print the contents of the DataFrame.

5.2 **CSV Data Manipulation**

From the DataFrame created in 5.1, perform the following tasks:

- Filter the rows where the Salary is greater than 55000.
- Print only the Name and Department columns for the filtered rows.

Question 6: Grouping and Aggregation

6.1 **Grouping by Department**

Using the DataFrame created in Question 5.1, group the data by the Department column and calculate the average Salary for each department. Print the result.

6.2 **Aggregation**

For the same DataFrame, find the minimum and maximum Salary for each Department.

Question 7: Merging DataFrames

7.1 **Merging Two DataFrames**

You are given two DataFrames:

df1 = pd.DataFrame({
    'Name': ['John', 'Jane', 'Emily'],
    'Department': ['Sales', 'Marketing', 'HR']
})

df2 = pd.DataFrame({
    'Name': ['John', 'Jane', 'Emily'],
    'Experience (Years)': [5, 7, 3]
})

Write the code to merge these two DataFrames on the Name column.

Print the merged DataFrame.

Question 8: Sorting

8.1 **Sorting Data**

Sort the DataFrame from Question 7.1 based on the Experience (Years) column in descending order. Print the sorted DataFrame.