Pandas hands-on

1. Create a program to read a CSV file containing student information and partial marks, and perform various data analysis tasks using pandas functions and statistics, with the following instructions/subtasks. Upload the Jupyter Notebook on e-learning by **9th of October EOD**.

A. **Read the CSV File:**

- Read the CSV file into a pandas DataFrame.
- Display the first few rows of the DataFrame to understand its structure.

B. **Data Cleaning and Preparation:**

- Handle any missing values in the DataFrame, if present.
- Convert necessary columns to appropriate data types (e.g., numeric columns for partial marks).

C. **Data Analysis Tasks:**

- Calculate descriptive statistics (mean, median, minimum, maximum).
- Create a function to calculate the final grade based on partial marks (e.g., weighted average).
- Count the number of students in each grade range (e.g., [0-5[, [5,10[, [10,15[and [15,20], based on the final grade).

D. Data Manipulation:

• Use groupby to calculate the average marks for each course.

E. Data Filtering and Sorting:

• Filter the DataFrame to show only students with marks above a certain threshold.
• Sort the DataFrame by multiple columns (e.g., final grade and number/name).

F. Indexing and Selection:

• Demonstrate different ways to select data: using column labels, boolean indexing, and loc/iloc.
• Set a column as the index and show how it affects data selection.

G. Data Export:

• After performing various operations, export the resulting DataFrame to different formats (CSV, Excel).