NumPy & Pandas: Practical Questions

NumPy Section:

1. Install and import the NumPy library. Check its version.

2. Create a 1D NumPy array with elements from 0 to 9 using array().

3. Generate a 2D array with shape (3, 4) using arange().

4. Create an array of 5 equally spaced numbers between 0 and 1 using linspace().

5. Slice and extract a subarray from a 2D array of shape (4, 5).

6. Reshape a 1D array of size 12 into a 3x4 matrix.

7. Print the shape, data type, and number of dimensions of an array.

8. Perform element-wise addition and multiplication on two same-sized arrays.

9. Demonstrate broadcasting with a 1D array and 2D array.

10. Find the mean, standard deviation, and sum of a 2D array.

Pandas Section:

11. Create a Series of 5 numbers and assign custom labels.

12. Construct a DataFrame from a dictionary with student names, marks, and cities.

13. Create a DataFrame from a NumPy array and assign column names.

14. Use loc and iloc to select specific rows and columns from a DataFrame.

15. Apply head(), tail(), shape, info(), and describe() to explore a DataFrame.

16. Sort a DataFrame by values in a column using sort_values().

17. Sort a DataFrame based on the index using sort_index().

18. Filter rows in a DataFrame where a column (e.g., marks) is greater than a threshold.

19. Group a DataFrame by a column (e.g., city) and calculate the average marks.

20. Use agg() to apply multiple aggregation functions (mean, min, max) on a grouped DataFrame.

21. Merge two DataFrames on a common column (e.g., student ID).

22. Concatenate two DataFrames vertically and reset the index.