KONERU LAKSHMAIAH EDUCATION FOUNDATION
(Deemed to be University, Estd. u/s. 3 of UGC Act 1956)

A.Y.2023-24
DATA ANALYTICS AND VISUALIZATION
(22CS2227)
CO-3- HOME ASSIGNMENT

1) Pandas Series and Data Frame

a) Explain the difference between a Pandas Series and a Pandas DataFrame. Provide examples to illustrate each.

b) Discuss the importance of index in Pandas Series and DataFrame. How does it influence data manipulation and retrieval?

c) Create a Pandas Series containing the following data: [10, 20, 30, 40, 50]. Perform various operations such as slicing, indexing, and arithmetic operations on the series.

d) Create a Pandas DataFrame from a dictionary containing students' names and their corresponding scores in two subjects (Mathematics and Science). Perform operations to manipulate and analyze the DataFrame, such as sorting, indexing, and aggregating data.

2) Indexing and Sorting, Loading Data from CSV

a) Explain the concept of indexing in Pandas. Discuss different methods of indexing available in Pandas DataFrame with examples.

b) Describe the process of sorting data in a Pandas DataFrame. Provide examples illustrating both ascending and descending sorting.

c) Load a CSV file into a Pandas DataFrame using the **read_csv()** function. Perform data exploration tasks such as checking data types, handling missing values, and basic statistical analysis.

d) Apply indexing and sorting techniques to the loaded DataFrame. Demonstrate how to set and reset indexes, perform hierarchical indexing, and sort data based on specific columns.

3) Aggregation and Concatenation, Grouping Data

a) Explain the concept of aggregation in Pandas. Provide examples of aggregation functions and demonstrate how they can be applied to Pandas DataFrame for summarizing data.

b) Discuss the process of concatenating multiple DataFrames in Pandas. Illustrate scenarios where concatenation is useful and provide examples to show how it's done.

c) Group data in a Pandas DataFrame based on certain criteria using the **groupby()** function. Apply aggregation functions to the grouped data to summarize information within each group.

d) Combine aggregation, concatenation, and grouping techniques to perform advanced data analysis tasks on a given dataset. Provide explanations and code examples to demonstrate the process.