Data Science, Analytics and Visualization for beginners.

1. Differentiate between descriptive, predictive, and prescriptive analytics. Provide an example of each.
2. Explain the role of data visualization in data science. How does it aid in understanding and communicating insights from data?
3. Name three popular programming languages used in data science and analytics. Briefly describe their strengths and applications.
4. Outline the importance of exploratory data analysis (EDA) in the data science process. What are some common techniques used in EDA?
5. Define correlation and explain its significance in data analysis. How can correlation be used to inform decision-making?
6. For each of the following scenarios, state the most appropriate type of chart or graph to use and explain why:
   1. a) Comparing the performance of multiple categories over time.

II. b) Visualizing the distribution of a single numerical variable.

III. c) Displaying the relationship between two continuous variables.

1. d) Comparing proportions or percentages across different categories.
2. e) Showing the composition of a whole in terms of its parts.
3. f) Highlighting the frequency or count of different categories in a dataset.
4. g) Comparing the distribution of a numerical variable across multiple groups.
5. h) Illustrating the correlation between two variables and identifying outliers.
6. i) Visualizing geographical data or data with spatial relationships.
7. Differentiate between descriptive and inferential statistics. Provide an example of each.
8. List and describe the three measures of central tendency commonly used in descriptive statistics. How do you calculate each measure?
9. Explain the purpose of a histogram and how it is used in data visualization. What information does a histogram convey about a dataset?
10. Define variance and standard deviation in the context of descriptive statistics. How do they help in understanding the spread or dispersion of data?
11. What is a box plot, and what information does it convey about a dataset? Describe the key components of a box plot and their interpretations.
12. Explain the concept of skewness and how it affects the distribution of data. Differentiate between positive and negative skewness.
13. Describe a scatter plot and its usefulness for visualizing relationships between variables. What types of relationships can be identified using a scatter plot?
14. Define quartiles and percentiles in descriptive statistics. How are they used to divide and interpret data?
15. How do you interpret the interquartile range (IQR) in relation to a box plot? What does the IQR indicate about the spread of the middle 50o4 of the data?