**Statistic Assignment : 1**

**Q1. What is Statistics?**

Statistics is the branch of mathematics that deals with the collection, organization, analysis, interpretation, and presentation of data. It is used to make informed decisions based on data patterns and trends.

**Q2. Define the different types of statistics and give an example of when each type might be used.**

1. **Descriptive Statistics**: Involves summarizing and describing the main features of a dataset.  
   *Example*: Calculating the average score of a class in an exam.
2. **Inferential Statistics**: Involves making predictions or inferences about a population based on a sample of data.  
   *Example*: Estimating the average income of a country based on a survey of 1,000 households.

**Q3. What are the different types of data and how do they differ from each other? Provide an example of each type of data.**

1. **Qualitative Data (Categorical)**: Describes attributes or characteristics.  
   *Example*: Eye color (blue, green, brown).
2. **Quantitative Data (Numerical)**: Represents numerical values.
   * **Discrete Data**: Countable values.  
     *Example*: Number of students in a classroom.
   * **Continuous Data**: Measurable values.  
     *Example*: Height of students in a class.

**Q4. Categorise the following datasets with respect to quantitative and qualitative data types:**

(i) **Grading in exam**: Qualitative (Ordinal)  
(ii) **Colour of mangoes**: Qualitative (Nominal)  
(iii) **Height data of a class**: Quantitative (Continuous)  
(iv) **Number of mangoes exported by a farm**: Quantitative (Discrete)

**Q5. Explain the concept of levels of measurement and give an example of a variable for each level.**

1. **Nominal**: Categories without a specific order.  
   *Example*: Types of fruits (apple, orange, banana).
2. **Ordinal**: Ordered categories.  
   *Example*: Educational levels (high school, bachelor's, master's).
3. **Interval**: Numerical data without a true zero point.  
   *Example*: Temperature in Celsius.
4. **Ratio**: Numerical data with a true zero point.  
   *Example*: Weight of an object.

**Q6. Why is it important to understand the level of measurement when analyzing data? Provide an example to illustrate your answer.**

Understanding levels of measurement helps in choosing the correct statistical methods. For example, calculating the mean is appropriate for ratio data (e.g., income) but not for nominal data (e.g., eye color).

**Q7. How nominal data type is different from ordinal data type?**

* **Nominal Data**: Represents categories without a meaningful order.  
  *Example*: Types of cars (SUV, sedan, hatchback).
* **Ordinal Data**: Represents categories with a meaningful order but no consistent difference between categories.  
  *Example*: Satisfaction levels (satisfied, neutral, dissatisfied).

**Q8. Which type of plot can be used to display data in terms of range?**

A **box plot (box-and-whisker plot)** can be used to display data in terms of range, showing the minimum, maximum, median, and quartiles.

**Q9. Describe the difference between descriptive and inferential statistics. Give an example of each type of statistics and explain how they are used.**

1. **Descriptive Statistics**: Summarizes data to describe its main features.  
   *Example*: Calculating the median age of employees in a company.
2. **Inferential Statistics**: Makes predictions or generalizations about a population based on a sample.  
   *Example*: Predicting election results based on exit polls.

**Q10. What are some common measures of central tendency and variability used in statistics? Explain how each measure can be used to describe a dataset.**

1. **Measures of Central Tendency**:
   * **Mean**: Average value of the dataset. Useful for identifying overall trends.
   * **Median**: Middle value when data is ordered. Useful for skewed data.
   * **Mode**: Most frequent value. Useful for categorical data.
2. **Measures of Variability**:
   * **Range**: Difference between maximum and minimum values. Indicates data spread.
   * **Variance**: Measures the average squared deviation from the mean. Shows variability.
   * **Standard Deviation**: Square root of variance. Indicates how much data deviates from the mean.