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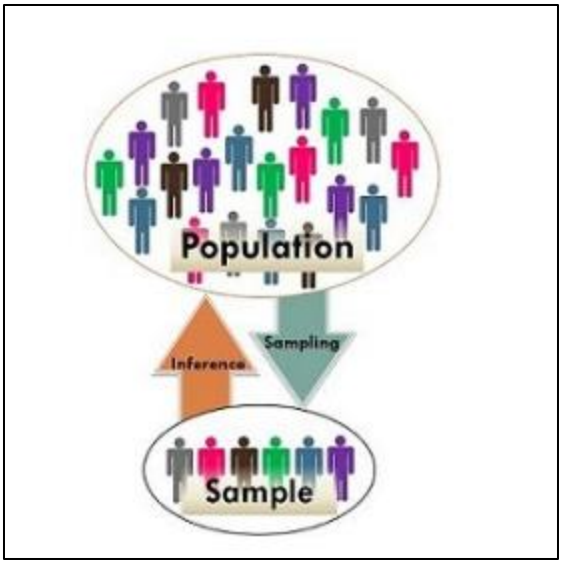
Statistics Assignment 1

1. What exactly is the difference between descriptive and inferential statistics?

BASIS FOR COMPARISON	DESCRIPTIVE STATISTICS	INFERENTIAL STATISTICS
Meaning	Descriptive Statistics is that branch of statistics which is concerned with describing the population under study.	Inferential Statistics is a type of statistics, that focuses on drawing conclusions about the population, on the basis of sample analysis and observation.
What it does?	Organize, analyze and present data in a meaningful way.	Compares, test and predicts data.
Form of final Result	Charts, Graphs and Tables	Probability
Usage	To describe a situation.	To explain the chances of occurrence of an event.
Function	It explains the data, which is already known, to summarize sample.	It attempts to reach the conclusion to learn about the population, that extends beyond the data available.

2. I'm not sure what is the difference between a sample and a population?

Name: Chandrakant B Thakur



BASIS FOR COMPARISON	POPULATION	SAMPLE
Meaning	Population refers to the collection of all elements possessing common characteristics, that comprises universe.	Sample means a subgroup of the members of population chosen for participation in the study.
Includes	Each and every unit of the group.	Only a handful of units of population.
Characteristic	Parameter	Statistic
Data collection	Complete enumeration or census	Sample survey or sampling
Focus on	Identifying the characteristics.	Making inferences about population.

3. What distinguishes descriptive statistics from other types of statistics?

Name: Chandrakant B Thakur

Descriptive Statistics:

Descriptive statistics are a part of statistics that can be used to describe data. It is used to summarize the attributes of a sample in such a way that a pattern can be drawn from the group. It enables researchers to present data in a more meaningful way such that easy interpretations can be made. Descriptive statistics uses two tools to organize and describe data. These are given as follows:

- Measures of Central Tendency - These help to describe the central position of the data by using measures such as mean, median, and mode.
- Measures of Dispersion - These measures help to see how spread out the data is in a distribution with respect to a central point. Range, standard deviation, variance, quartiles, and absolute deviation are the measures of dispersion.

Basis	**Descriptive Statistics**	**Inferential Statistics**
Definition	Descriptive statistics is used to describe the characteristics of the population using a sample.	Inferential statistics uses various analytical tools to draw inferences about the population using samples.
Tools	Measures of central tendency and measures of dispersion.	Hypothesis testing and regression analysis.
Use	Organizes, describes and presents data in a meaningful way with the help of charts and graphs.	Tests, predicts, and compares data obtained from various samples.
Relevance	It is used to summarize known data in a way that can be used for further predictions and analysis.	It tries to use the summarized samples to draw conclusions about the population.

4. What is the difference between quantitative and qualitative data?

The main differences between quantitative and qualitative data lie in **what they tell us**, **how they are collected**, and **how they are analyzed.** Let’s summarize the key differences before exploring each aspect in more detail:

Name: Chandrakant B Thakur

- Quantitative data is countable or measurable, relating to numbers. Qualitative data is descriptive, relating to language.
- Quantitative data tells us how many, how much, or how often (e.g. “20 people signed up to our email newsletter last week”). Qualitative data can help us to understand the “why” or “how” behind certain behaviors, or it can simply describe a certain attribute—for example, “The postbox is red” or “I signed up to the email newsletter because I’m really interested in hearing about local events.”
- Quantitative data is fixed and “universal,” while qualitative data is subjective and dynamic. For example, if something weighs 20 kilograms, that can be considered an objective fact. However, two people may have very different qualitative accounts of how they experience a particular event.
- Quantitative data is gathered by measuring and counting. Qualitative data is collected by interviewing and observing.
- Quantitative data is analyzed using statistical analysis, while qualitative data is analyzed by grouping it in terms of meaningful categories or themes.

Quantitative data:

- My best friend is 5 feet and 7 inches tall
- They have size 6 feet
- They weigh 63 kilograms
- My best friend has one older sibling and two younger siblings
- They have two cats
- My best friend lives twenty miles away from me
- They go swimming four times a week

Qualitative data:

- My best friend has curly brown hair
- They have green eyes
- My best friend is funny, loud, and a good listener

Name: Chandrakant B Thakur

- They can also be quite impatient and impulsive at times
- My best friend drives a red car
- They have a very friendly face and a contagious laugh

5. What is the definition of a percentile?

Percentile is defined as the value below which a given percentage falls under. For example, in a group of 20 children, Ben is the 4th tallest and 80% of the children are shorter than you. Hence, it means that Ben is at the 80th percentile. It is most commonly used in competitive exams such as SAT, LSAT, etc.

Percentile Formula

$P = (n/N) \times 100$

Where,

- n = ordinal rank of the given value or value below the number
- N = number of values in the data set
- P = percentile