UNDERSTANDING KEY STATISTICAL TERMS

Explore the fundamental concepts of statistics to better analyze and interpret data effectively.

Ode Godswill

STATISTICAL TERMS: INDIVIDUALS VS VARIABLES

Individuals

- Represent the entities being studied (people, objects, organizations)
- Can be identified and measured

Variables

- Can be measured or observed
- Can change or vary across individuals

POPULATION VS SAMPLE

This slide compares the concepts of population and sample in statistical analysis.

Population

- Includes all members of a specified group.
- Represents the entire set of data.
- Can be large or small, depending on the study.
- Every individual in the population can be measured.
- Population parameters are fixed and specific.
- Used when complete data is necessary.
- Difficult to gather data on a large population.
- Often requires significant resources and time.
- Results can be more accurate as they include all data.
- Population data is used to derive insights for the entire group.
- Statistical analysis can provide more robust conclusions.

Vs

Sample

- A subset of the population.
- Represents a portion of the entire group.
- Always smaller than the population.
- Used to estimate population characteristics.
- Sample parameters can vary due to random selection.
- Used when complete data collection is impractical.
- Easier and faster to gather data from a sample.
- Requires fewer resources and time compared to population studies.
- Results can be less accurate if the sample is not representative.
- Sample data is used to infer insights about the population.
- Statistical analysis may yield less robust

PARAMETER VS STATISTIC

Parameter Vs Statistic
A parameter is a numerical value that describes an entire population, like the average height of all adults in a country. On the other hand, a statistic is a value that describes a sample of the population, like the average height of 1,000 randomly selected adults [1].

DESCRIPTIVE VS INFERENTIAL STATISTICS

Descriptive Statistics

This involves methods of organizing, picturing and summarizing information from samples and populations. It is basically just making pictures from it.

Inferential Statistics

Make conclusions or predictions about a larger population based on a sample
- Draw inferences beyond the sample
- Focus on making generalizations

QUALITATIVE VS QUANTITATIVE DATA

Understanding Different Data Types Qualitative Vs Quantitative Data
Qualitative Data

- Non-numerical
- Descriptive
- Exploratory
- Subjective
- Text, images, observations

Examples:

- Interviews
- Focus groups
- Surveys (open-ended)
- Case studies
- Content analysis

Qualitative Data
- Ordinal Data: Categorical, with inherent order but no equal intervals (e.g., education level, satisfaction ratings)
- Ratio Data: Numerical, equal intervals, with a true zero (e.g., height, weight, time)

TYPES OF SAMPLING

Different types of Sampling Different types of Sampling

1. Simple Random Sampling: Every member of the population has an equal chance of selection.

2. Stratified Sampling: Divide the population into subgroups (strata) and randomly sample from each.

3. Systematic Sampling: Select every nth member from a list or population.

4. Cluster Sampling: Randomly select groups (clusters) and sample all members within.

GUIDELINES FOR PLANNING A STATISTICAL STUDY

Basic Guidelines for Planning a Statistical Study Basic Guidelines for planning a statistical study

TYPES OF STUDY

1. Experimental Study: Manipulate variables to establish cause-and-effect relationships
2.Non-Experimental Study: Observe without manipulating variables.
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UNDERSTANDING OUTLIERS

Outliers

TIME SERIES, BAR GRAPHS, AND PIE CHARTS

Time series/Bar Graphs and Pie Chart

MEASURES OF CENTRAL TENDENCY

Understanding Key Concepts Measures of Central tendency

MEASURES OF VARIATION AND FORMULAS

Understanding the Concepts Measures of Variation and formulas

DATA ANALYSIS AND STATISTICS RELATIONSHIP

Data analysis and Statistics are closely intertwined. Statistics provide the mathematical framework for data analysis, allowing you to extract insights and meaning from data.
Data analyis involves using statistical methods to identify trends, patterns, and correlations with data. This helps business makes informed decisions, predict outcomes, and optimize processes.