Statistical Tests:

Definition: Statistical tests are specific procedures or techniques used to make formal statistical inferences or decisions about a population or data based on a sample. These tests are designed to assess whether observed data provide enough evidence to support or reject a particular hypothesis or claim.

Purpose: The primary purpose of statistical tests is hypothesis testing. They are used to determine if differences, relationships, or effects observed in sample data are statistically significant and not likely due to random chance.

Examples: Common statistical tests include t-tests (for comparing means), chi-squared tests (for testing associations in categorical data), ANOVA (Analysis of Variance), correlation tests (e.g., Pearson correlation), and hypothesis tests for population parameters (e.g., testing the population mean).

Statistical Methods:

Definition: Statistical methods refer to a broader set of tools, techniques, and approaches used in statistics for various purposes, including data analysis, summarization, modeling, and inference. These methods encompass a wide range of statistical procedures and strategies.

Purpose: Statistical methods serve a wide variety of purposes, including data exploration, data visualization, descriptive statistics, regression analysis, time series analysis, clustering, and dimensionality reduction. Some methods are used for hypothesis testing (like the statistical tests mentioned earlier), while others are for data exploration and modeling.

Examples: Statistical methods include a vast array of techniques such as linear regression, logistic regression, principal component analysis (PCA), factor analysis, cluster analysis, survival analysis, and many more. These methods are used for different types of data and research questions.

In summary, the key difference between statistical tests and statistical methods is their focus and scope:

Statistical tests are specific procedures designed primarily for hypothesis testing, determining the statistical significance of observed effects or differences in data.

Statistical methods refer to a broader set of tools and techniques used for various purposes, including data analysis, summarization, modeling, and inference. They encompass a wide range of statistical procedures beyond hypothesis testing and are applied at different stages of data analysis to achieve various objectives.

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