

Types of statistics

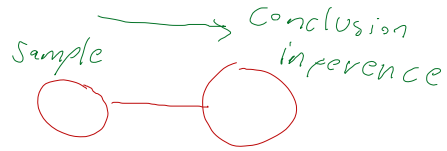
1) Descriptive Statistics

Descriptive statistics involves methods for summarizing and organizing data to make it understandable. This type of statistics helps to describe the basic features of the data in a study.

- 1) Measure of central tendency
[mean, median, mode]
- 2) Measure of dispersion
[variance, standard deviation]
- 3) Data distribution
[histograms, box plot, pie chart, PDF, PMF]
- 4) Summary statistics
[five number summary Q1, Q2, Q3, Maximum]

2) Inferential statistics

Inferential statistics involves methods for making prediction or inferences about a population based on a sample of data. It allows for hypothesis testing, estimation and drawing conclusions.



- 1) Hypothesis testing
- 2) P value
- 3) Confidence Interval
- 4) Statistical Analysis Test:
 - i) Z test
 - ii) t test
 - iii) Anova -> F test
 - iv) CHI square

Summary

Type of Statistics	Key Concepts	Examples
Descriptive Statistics	Measures of Central Tendency (Mean, Median, Mode), Measures of Dispersion (Range, Variance, Standard Deviation), Data Distribution (Histograms, Box Plots), Summary Statistics (Five-number Summary)	Mean score of students, Range of temperatures, Histogram of ages
Inferential Statistics	Hypothesis Testing (Null and Alternative Hypotheses, P-value), Confidence Intervals, Regression Analysis (Simple and Multiple Linear Regression), ANOVA, Chi-Square Test	P-value in test scores comparison, 95% confidence interval for average height, Predicting house prices, Comparing test scores of different schools, Association between gender and product preference

Example

Let say there are 20 statistics class in your college and you have collected the height of students in the class

Heights are recorded [175 cm, 180 cm, 140 cm, 135 cm, 160 cm, 120 cm]

Descriptive question

"What is the average height of the entire classroom?" <-- Measure of central tendency

Inferential Question

"Are the height of the sample students in classroom similar to what you expect in the entire college?"

