

Visualization Basics

Data visualization helps summarize and understand data patterns by using charts and plots.

It is a crucial first step in exploratory data analysis (EDA).

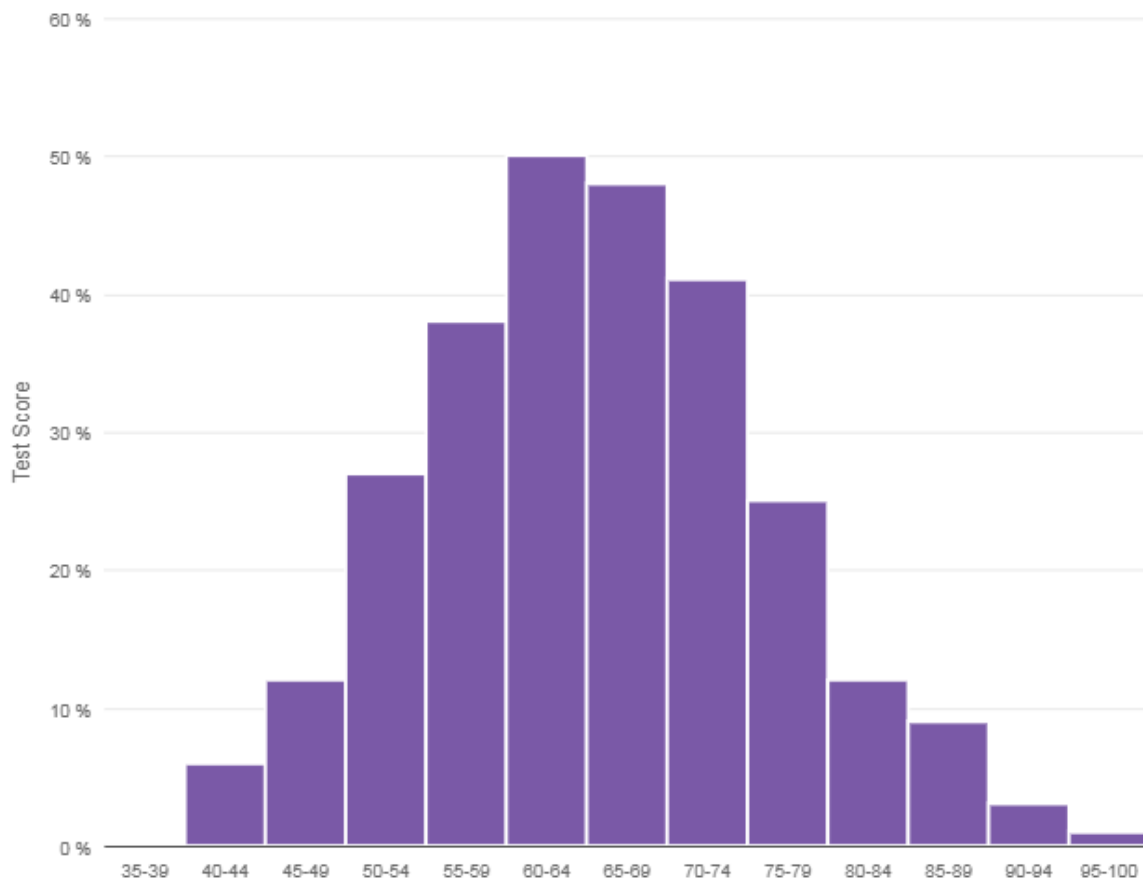
The most common visualization tools in descriptive statistics are:

- Histogram
- Boxplot
- Bar Chart

1. Histogram

A histogram displays the distribution of numerical data by grouping values into bins.

- When to Use
 - To visualize the shape of the distribution (normal, skewed, uniform).
 - To identify outliers and spread.
- Example
 - Exam scores distribution across students.
- Visual Example



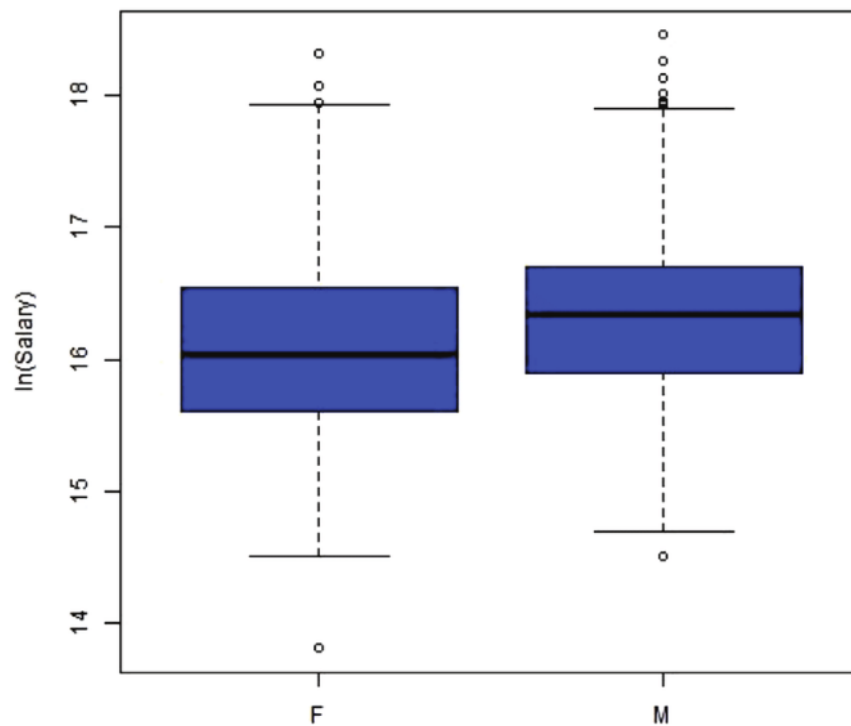
2. Boxplot (Whisker Plot)

A boxplot visualizes the five-number summary:

- Minimum, Q1, Median, Q3, Maximum

It also highlights outliers.

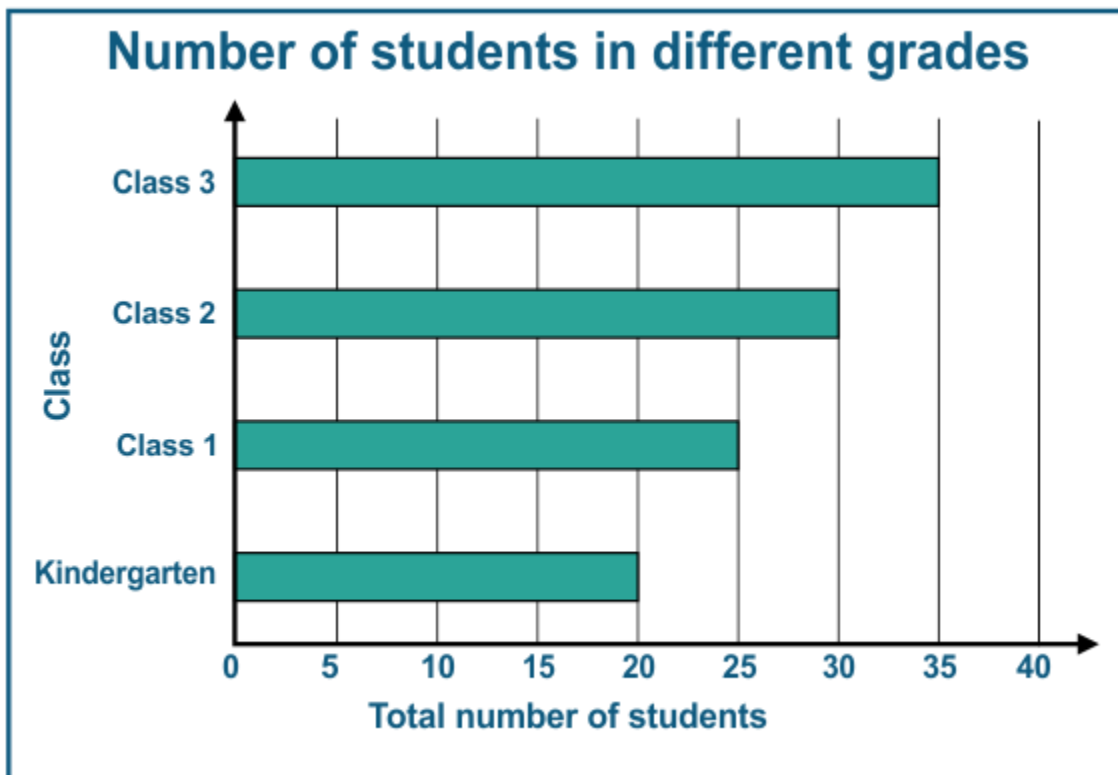
- When to Use
 - To quickly identify skewness and spread.
 - To detect outliers.
- Example
 - Comparing salaries across departments.
- Visual Example



3. Bar Chart

A bar chart represents categorical data with rectangular bars proportional to their frequencies.

- When to Use
 - To compare categories.
 - Best for discrete variables (e.g., gender, product types).
- Example
 - Number of students in each grade category.
- Visual Example



4. Comparison Table

Chart Type	Best For	Example
Histogram	Numerical distribution	Income distribution
Boxplot	Spread & outliers	Salary ranges
Bar Chart	Categorical comparison	Favorite food categories