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## What is T-test?

T-test is a statistical test used to determine whether there is a significant difference between the means of two groups.

It is particularly useful when the sample size is small (typically  $n < 30$ ) and the population standard deviation is unknown. The T-test relies on the t-distribution, which is similar to the normal distribution but has heavier tails.

## Types of T-Tests

There are three types of T-test i.e.,

### 1. One-Sample T-Test

- Compares the sample mean to a known value (usually a population mean).
- Used to determine if the sample comes from a population with a specific mean.

### 2. Two-Sample T-Test (Independent T-Test)

- Compares the means of two independent samples.
- Used to determine if there is a significant difference between the means of two groups.

### 3. Paired Sample T-Test (Dependent T-Test)

- Compares means from the same group at different times (e.g., before and after a treatment) or from matched pairs.
- Used to determine if there is a significant difference between paired observations.