Test of Means

Adejumo Ridwan Suleiman

Student t-test

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- Used to compare mean values between two groups.
- Compare sample mean with hypothetical population mean value.
- Data distribution is normally distributed.
- Sample size is less than 30.

Assumptions

- Data is measured on an interval scale
- Groups are measured independently
- Outcome variable is normally distributed
- Homogeneity of variance
- Samples are independently drawn

How to check for assumptions

Assumption	Check
Normality	Histogram, Shapiro-Wilk Test
Homogeneity of Variance	Levene's Test
Independence of observation	Examine data collecttion methodology or Durbin Watson test

Types of Student t-test

- **One sample t-test.**
- **Dependent 2-sample** or **Paired sample t-test.**
- **Independent 2-sample t-test.**

One Sample t-test

Assumptions

General assumption of **t-test** applies

Dependent 2-sample or Paired sample t-test

Assumptions

- General assumption of **t-test** applies .
- Data comes from paired observations.

Independent 2-sample t-test

Assumptions

- General assumption of t-test applies
- No relationship between observations of different groups

F-test

F-test

- More than two groups
- Means are tested through ANOVA
  - **One-way ANOVA** (Single Factor)
  - **Two-way ANOVA** (Two factors)

One-way ANOVA Assumptions

- The data is randomly sampled
- The samples are normal distributed
- Samples size may or may not be equal
- Homogeneity of variances
- Residuals are normally distributed

Post-hoc tests

- Least Significant Difference (LSD)
- Duncan Multiple range test
- Turkey test