

1. Independent Samples t-test

File: ttest_data.xlsx

Goal: Compare means between Group A and B

Steps:

1. Open SPSS > File > Open > Data > choose ttest_data.xlsx
 2. Click Analyze > Compare Means > Independent-Samples T Test
 3. Move Score to **Test Variable**
 4. Move Group to **Grouping Variable** → click Define Groups → enter A and B
 5. Click **OK**
 6. **Interpret:**
 - Check Levene's Test for Equality of Variances
 - Use row with correct assumption
 - Look at Sig. (2-tailed) to see if $p < .05$ (significant)
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2. Mann–Whitney U Test (Non-Parametric)

File: mannwhitney_data.xlsx

Goal: Compare two non-normally distributed groups

Steps:

1. Open file in SPSS
 2. Click Analyze > Nonparametric Tests > Independent Samples
 3. Select Fields tab:
 - Test Field: Score
 - Groups: Group
 4. Select Settings tab:
 - Click Customize tests > Check **Mann–Whitney U**
 5. Click **Run**
 6. **Interpret:**
 - Look for **Asymp. Sig. (2-tailed)**
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3. Paired t-test (or Wilcoxon Signed-Rank)

File: paired_data.xlsx

Goal: Compare Pretest and Posttest of same group

Steps for Paired t-test:

1. Open file in SPSS
2. Click Analyze > Compare Means > Paired-Samples T Test
3. Move Pretest and Posttest to **Paired Variables**
4. Click **OK**
5. Interpret Sig. (2-tailed) in output

Steps for Wilcoxon Signed-Rank (if not normal):

1. Click Analyze > Nonparametric Tests > Related Samples
 2. Select both Pretest and Posttest
 3. In Settings, check **Wilcoxon Signed-Rank Test**
 4. Click **Run**
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4. One-Way ANOVA

File: anova_data.xlsx

Goal: Compare means among 3 groups

Steps:

1. Open file
 2. Click Analyze > Compare Means > One-Way ANOVA
 3. Move Score to **Dependent List**
 4. Move Group to **Factor**
 5. Click **OK**
 6. **Optional:** Click Post Hoc (e.g., Tukey) if you want to compare all group pairs
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5. Kruskal–Wallis Test

File: kruskal_data.xlsx

Goal: Compare 3 non-normal groups

Steps:

1. Click Analyze > Nonparametric Tests > Independent Samples
2. In Fields tab:
 - Test Field: Score
 - Groups: Group

3. In Settings, check **Kruskal-Wallis H**
 4. Click **Run**
 5. Interpret p-value in results
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6. Correlation (Pearson or Spearman)

File: correlation_data.xlsx

Goal: Measure association between study hours and scores

Steps:

1. Open file
 2. Click Analyze > Correlate > Bivariate
 3. Select Study_Hours and Exam_Score
 4. Choose:
 - Pearson (normal data)
 - Spearman (non-normal)
 5. Click **OK**
 6. Interpret correlation coefficient (r) and Sig. (2-tailed)
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7. Chi-Square Test (for Independence)

File: chi2_data.xlsx

Goal: Test if Gender is related to Teaching Method

Steps:

1. Click Analyze > Descriptive Statistics > Crosstabs
2. Move Gender to **Row**, Teaching_Method to ****Column**
3. Click **Statistics** > check **Chi-square**
4. Click **Cells** > check **Expected** and **Row %**
5. Click **OK**
6. Interpret:
 - Pearson Chi-Square: $p < .05$ = significant relationship