Summary of Tests

Test of Means

Test Category	Assumption	Regular Test	Test if Assumption violated
One population mean	Normal or large sample size (n>=30)	T-test	Sign Test
One population proportion	>=5 in each category	Z-test	Calculate exact probability
Mean of two groups	Normal or large sample size (n>=30), independent between two groups	T-test	Wilcoxon rank sum
Two population proportions	>=5 in each category, independent between two groups	Z-test	Calculate exact probability
Mean difference of two paired groups	Normal or large sample size (n>=30)	Paired T-test	Wilcoxon signed rank test
Mean of 3+ groups	Normal, equal variance, independent	F-test (ANOVA)	Kruskal-Wallis test
The 3+ measurements on the same subject	Normal, equal variance	Repeated measures ANOVA test	Friedman test

Test of Association

Test Category	Assumptions	Regular Test	Test if Assumption violated
Relationship between 2 continuous variables	Normal	Pearson's Correlation Coefficient	Spearman's Correlation Coefficient
Relationship between two categorical variables	All expected values>1, At least 80% of the cells should have an expected count >5	Chi-squared test	Fisher's exact test

Test of Assumptions

Test Category	Assumptions	Test Name
Normality		Shapiro Wilk test QQ plot
Homogeneity of variance		Levene's test
Compare two population variance	Normal, Independent	F-test
Nested Regression models	Normal, Independent	F-test