

## **Nonparametric Tests**

This guide illustrates how to perform a variety of nonparametric tests. For information on nonparametric correlations and measures of association, see the page **Nonparametric Correlations**.

## **One-Sample Nonparametric Tests**

- 1. From an open JMP data table, select **Analyze > Distribution**.
- Select one or more continuous variables from Select Columns, click Y, Columns, and click OK. The variable 'Horsepower' was used in this example.
- From the Distributions report window, click on the red triangle for the variable and select Test Mean.
- 4. Enter the hypothesized value under Specify Hypothesized Mean, check the Wilcoxon Signed Rank box, and click OK. The hypothesis being tested under the Wilcoxon Signed Rank test is: H₀: Median = 140 vs. H<sub>A</sub>: Median ≠ 140

The following results for both the one-sample t-Test and the Signed-Rank are provided.

- The test statistics (the t-Test and Signed-Rank).
- P-values for both one- and two-tailed tests. The p-value for the two-tailed test is next to Prob > |t|.

## Two-Sample and Oneway Nonparametric Tests

- 1. Select Analyze > Fit Y by X.
- Select a continuous variable and click Y, Response, and select a categorical variable and click X, Factor, then click OK. The Oneway Analysis output window will display.
- Under the red triangle, select Nonparametric > Wilcoxon Test / Kruskal-Wallis Test to perform the analysis adding results to the report.
  - If the categorical variable has only two levels, both the Normal Approximation and ChiSquare Approximation test statistics and corresponding p-values with be shown.
  - If the variable has three or more levels, only the **ChiSquare Approximation** will be performed.

Note: the **Wilcoxon / Kruskal-Wallis Rank Sum Test** is sometimes called the Mann-Whitney Test.

Visit Basic Analysis > Distributions > Options for Continuous Variables > Test Mean, Basic Analysis > Oneway Analysis > The Oneway Platform Options, Basic Analysis > Oneway Analysis > Oneway Analysis Reports to learn more.

Car Physical Data.jmp (Help > Sample Data Folder)						
🏞 Test Mean - Horsepower	×					
Specify Hypothesized Mean Enter True Standard Deviation to do z-test rather than t test If you also want a nonparametric test: Wilcoxon Signed Rank						
OK Cancel	Help					



Nonparametric	•	~	Wilcoxon / Kruskal-Wallis Test	
Unequal Variances			Median Test	
Equivalence Tests (update	ed) 🔸		van der Waerden Test	
Robust	•		Friedman Rank Test	
Power			Jonckheere Terpstra Test	
Set a Level	•		Exact Test	Þ
Normal Quantile Plot	•		Nonparametric Multiple Comparisons	

A test on Horsepower amount across two country levels

⊿ Wilcoxon / Kruskal-Wallis Tests (Rank Sums)								
	Level	Count	Score Su	Expect Im Sco	ed ore	Score Mean	(Mean-	Mean0)/Std0
	Japan	30	1095.	00 1200.	00	36.5000		-1.057
	USA	49	2065.	00 1960.	00	42.1429		1.057
	⊿ Wilcoxon Two-Sample Test, Normal Approximat						tion	
		S	z	Prob> Z				
		1095	-1.05748	0.2903				
Kruskal-Wallis Test, ChiSquare Approximation								
	Chi	Square	DF F	vob>ChiSq				
		1.1290	1	0.2880				

A test on Horsepower amount across three country levels

⊿	Wilcoxon / Kruskal-Wallis Tests (Rank Sums)								
	Level	Count	Score S	um	Expected Score	Score Mean	(Mean-I	Vlean0)/Std0	
	Japan	30	1726	5.00	1755.00	57.5333		-0.180	
	Other	37	1828	8.00	2164.50	49.4054		-1.992	
	USA	49	3232	2.00	2866.50	65.9592		2.042	
	Kruskal-Wallis Test, ChiSquare Approximation								
	ChiSquare		DF	Prol	>ChiSq				
	5.1509		2		0.0761				