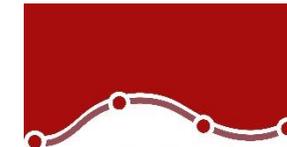




**SPSS**



**Statistics for  
Data Analysis**

## WHO WE ARE

SPS is an Italian center of statistical data analysis with more than 20 years of experience.

SPS was born in 1994 as SPSS Italia and it was the only reseller in Italy for SPSS software suite, authorised by SPSS inc.

Today SPS is an IBM Gold Business Partner, Software Support Provider and Expert Level in Data Science & Business Analytics.

## CONTACTS

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## DATASHEET

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# Exact Tests



# Statistics for Data Analysis

Organizations can solve a wide array of business and research problems with the solution Statistics for Data Analysis.

Compared to other statistical software, the solution is easier to use, has a lower total cost of ownership and more comprehensively addresses the entire analytical process, from planning to data collection to analysis, reporting and deployment.

Organizations of all types rely on Statistics for Data Analysis to help increase revenue, outmaneuver competitors, conduct research and make better decisions. With decades of built-in expertise and innovation, it's a leading choice for reliable statistical analysis.

Statistics Base is part of the solution Statistics for Data Analysis, which consists of:

- Software license
- Add-On
- SPS Service Program

This comprehensive, easy-to-use solution includes many different procedures and tests to help users solve complex business and research challenges.

## Highlights Statistics for Data Analysis

- Get support through every step of the analytical process.
- Carry out essential analyses from an intuitive graphical interface.
- Select from more than a dozen integrated products to make specialized analyses faster and easier.



# Statistics for Data Analysis

The solution analytical capabilities to meet the analysis requirements of any type of organization, from basic tools for solving common problems to advanced analytical techniques that enable all type of organization to address complex challenges.

Statistics for Data Analysis can help you:

- Analyze your data with new and advanced statistics, including a variety of new features within UNIANOVA methods
- Integrate better with third-party applications, including stronger integration with Microsoft Office
- Save time and effort with productivity enhancements:
  - More attractive and modern-looking charts in Chartbuilder
  - New groundbreaking features in Statistics Amos 25
  - Data and syntax editor enhancements
  - Accessibility improvements for the visually impaired
  - Updated merge user interface
  - Simplified toolbars

Statistics for Data Analysis can access quickly, manage and analyze any kind of dataset, including survey data, corporate databases or data downloaded from the web.

In addition, the software can process Unicode data. This eliminates variability in data due to language-specific encoding and enables your organization to view, analyze and share data written in multiple languages.

## Business Benefit Statistics for Data Analysis

- Support business decisions with data-based analytics for improved outcomes.
- Be more confident in your results by incorporating data from many different sources, including geospatial information, in your analysis and using proven, tested techniques to perform your analysis.
- Save time and effort with capabilities that enable experienced analysts to develop procedures or dialogs that others can use to speed through repetitive tasks.
- Give results greater impact by using visualization capabilities that clearly show others the significance of your findings.



# Statistics Exact Tests

## Datasheet

*More accurately analyze small datasets*

To determine if a relationship between variables exists, researchers often first look at p values in crosstabulations and nonparametric tests.

Traditional methods for computing them are fine if your data meet the underlying assumptions. However, if you have a small number of case variables with a high percentage of responses in one category, or have to subset your data into fine breakdowns, traditional tests could be incorrect. Statistics Exact Tests eliminates this risk.

You'll find Statistics Exact Tests particularly useful if you perform data mining or database analysis for direct marketing research, survey research, medical research, biostatistics, social science research, or to conduct any type of experiment.

Statistics Exact Tests is available for installation as client-only software but, for greater performance and scalability, a client/server installation is also available.

### Highlights:

- “Slice and dice” data into fine breakdowns.
- Find rare occurrences within large datasets.
- No need to learn new statistical theories or procedures.



# Statistics Exact Tests

## Datasheet

### Use small samples credibly

If securing a large sample size is impossible or costly, Statistics Exact Tests enables you to use small samples and still feel confident about the results. With the money saved by using smaller sample sizes, you can conduct experiments surveys, or test direct marketing programs, more often.

### Obtain more value from your data

With Statistics Exact Tests, you can “slice and dice” your data into breakdowns, which can be as fine as you want, so you learn more by extending your analysis to subgroups. You aren’t limited by required expected counts of five or more per cell for correct results. And you can even rely on Statistics Exact Tests when you’re searching for rare occurrences within large datasets.

### Keep your original categories

Don’t lose valuable information by collapsing categories to meet the assumptions of traditional tests. With Statistics Exact Tests, you can keep your original design or natural categories – for example, regions, income, or age groups – and analyze what you intend to analyze.



# Statistics Exact Tests

## Datasheet

### Easily interpret and apply exact tests

Statistics Exact tests are easy to run. You can calculate them anytime with just a press of a button – during your original analysis or when you rerun it. With Statistics Exact Tests, there is no steep learning curve because you don't need to learn any new statistical theories or procedures. You simply interpret the exact tests results the same way you already interpret the results in Statistics for Data Analysis. And, you'll always have the right statistical test for your data situation. More than 30 exact tests cover the entire spectrum of nonparametric and categorical data problems for small or large datasets.



# Statistics Exact Tests Features

The following tests and statistics are available with Statistics Exact Tests. Statistics Base includes the asymptotic versions of these tests. All results are produced as Statistics Base pivot tables/report cubes.

## Pearson Chi-square test

- Exact 1-tailed and 2-tailed p values for 2x2 table
- Exact 2-tailed p value for general RxC table
- Monte Carlo 2-tailed p value and confidence intervals (CIs) for general RxC table

## Likelihood ratio test

- Exact 1-tailed and 2-tailed p values for 2x2 table
- Exact 2-tailed p value for general RxC table
- Monte Carlo 2-tailed p value and CIs for general RxC table

## Fisher's exact test

- Exact 1-tailed and 2-tailed p values for 2x2 table
- Exact 2-tailed p value for general RxC table
- Monte Carlo 2-tailed p value and CIs for general RxC table

## Linear-by-linear association test

- Exact 1-tailed and 2-tailed p values and exact point probability
- Monte Carlo 1-tailed and 2-tailed p values and CIs

## Contingency coefficient

- Exact 2-tailed p value
- Monte Carlo 2-tailed p value and CIsPhi
- Exact 2-tailed p value
- Monte Carlo 2-tailed p value and CIsCramer's V
- Exact 2-tailed p value
- Monte Carlo 2-tailed p value and CIs

## Goodman and Kruskal Tau

- Exact 2-tailed p value
- Monte Carlo 2-tailed p value and CIs

## Uncertainty coefficient – symmetric or asymmetric

- Exact 2-tailed p value
- Monte Carlo 2-tailed p value and CIs

## Kappa

- Exact 2-tailed p value
- Monte Carlo 2-tailed p value and CIs

## Gamma

- Exact 2-tailed p value
- Monte Carlo 2-tailed p value and CIs

## Kendall's Tau-b and Tau-c

- Exact 2-tailed p value
- Monte Carlo 2-tailed p value and CIs

## Somers' D – symmetric and asymmetric

- Exact 2-tailed p value
- Monte Carlo 2-tailed p value and CIs

**Pearson's R**

- Exact 2-tailed p value
- Monte Carlo 2-tailed p value and Cis

**Spearman correlation**

- Exact 2-tailed p value
- Monte Carlo 2-tailed p value and Cis

**McNemar test**

- Exact 1-tailed and 2-tailed p values and point probability

**Sign test**

- Exact 1-tailed and 2-tailed p values and point probability
- Monte Carlo 1-tailed and 2-tailed p values and Cis

**Wilcoxon signed-rank test**

- Exact 1-tailed and 2-tailed p values and point probability
- Monte Carlo 1-tailed and 2-tailed p values and Cis

**Marginal homogeneity test**

- Asymptotic, exact, Monte Carlo 1-tailed and two 2-tailed p values, and point probability

**2-Sample Kolmogorov-Smirnov test**

- Exact 2-tailed p value and point probability
- Monte Carlo 2-tailed p value and Cis

**Mann-Whitney U or Wilcoxon rank-sum W test**

- Exact 1-tailed and 2-tailed p values and point probability
- Monte Carlo 1-tailed and 2-tailed p values and Cis

**Wald-Wolfowitz runs test**

- Exact 1-tailed p value and point probability
- Monte Carlo 1-tailed p value and Cis

**Cochran's Q test**

- Exact 2-tailed p value and point probability
- Monte Carlo 2-tailed p value and Cis

**Friedman test**

- Exact 2-tailed p value and point probability
- Monte Carlo 2-tailed p value and Cis

**Kendall's coefficient of concordance**

- Exact 2-tailed p value and point probability
- Monte Carlo 2-tailed p value and Cis

**Kruskal-Wallis test**

- Exact 2-tailed p value and point probability
- Monte Carlo 2-tailed p value and Cis

**Median test**

- Exact 2-tailed p value and point probability
- Monte Carlo 2-tailed p value and Cis

**Jonckheere-Terpstra test**

- Asymptotic, exact, Monte Carlo 1-tailed and 2-tailed p values, and point probability

**1-Sample Chi-square test**

- Exact 2-tailed p value and point probability
- Monte Carlo 2-tailed p value and Cis

**1-Sample Kolmogorov-Smirnov test**

- Exact 2-tailed p value and point probability
- Monte Carlo 2-tailed p value and Cis

**1-Sample Wald-Wolfowitz runs test**

- Exact 2-tailed p value and point probability
- Monte Carlo 2-tailed p value and Cis

**Binomial test**

- Both exact 1-tailed and 2-tailed p values and point probability s



### **Statistics for Data Analysis solution**

Add more analytical power, as you need it, with optional modules and stand-alone software from the Statistics for Data Analysis family.

#### **Statistics Base**

Statistics Base includes the core capabilities to take the analytical process from start to finish. It is easy to use and includes a broad range of procedures and techniques to increase revenue, outperform competitors, conduct research and make better decisions.

#### **Statistics Advanced**

Statistics Advanced includes these powerful multivariate techniques: generalized linear models (GENLIN), generalized estimating equations (GEE), mixed level models, general linear mixed models (GLMM), variance component estimation, MANOVA, Kaplan-Meier estimation, Cox regression, hiloglinear, loglinear and survival analysis.

#### **Statistics Bootstrapping**

Statistics Bootstrapping enables researchers and analysts to use bootstrapping techniques on a number of tests contained in Statistics for Data Analysis modules. This provides an efficient way to ensure that your models are stable and reliable. With Statistics Bootstrapping, you can reliably estimate the standard errors and confidence intervals of a population parameter like a mean, median, proportion, odds ratio, correlation coefficient, regression coefficient and numerous.

#### **Statistics Categories**

Unleash the full potential of your categorical data through perceptual maps with optimal scaling and dimension reduction techniques. This add-on module provides you with everything you need to analyze and interpret multivariate data and their relationships more completely.

#### **Statistics Complex Samples**

Incorporate complex sample designs into data analysis for more accurate analysis of complex sample data. Statistics Complex Samples, with specialized planning tools and statistics, reduces the risk of reaching incorrect or misleading inferences for stratified, clustered or multistage sampling.

#### **Statistics Conjoint**

Statistics Conjoint helps market researchers develop successful products. By performing conjoint analysis, you learn what product attributes are important in the consumer's mind and what the most preferred attribute levels are, and can perform pricing studies and brand equity studies.

#### **Statistics Tables**

Use Statistics Tables to present survey, customer satisfaction, polling and compliance reporting results. Features such as a table builder preview, included inferential statistics and data management capabilities make it easy to clearly communicate your results.



### **Statistics Preparation**

With Statistics Preparation, you gain several procedures that facilitate the data preparation process. This add-on module enables you to easily identify suspicious and invalid cases, variables and data values; view patterns of missing data; summarize variable distributions to get your data ready for analysis; and more accurately work with algorithms designed for nominal attributes.

### **Statistics Decision Trees**

Create highly visual classification and decision trees directly within Statistics for Data Analysis for segmentation, stratification, prediction, data reduction and variable screening, interaction identification, category merging and discretizing continuous variables. Highly visual trees enable you to present results in an intuitive manner.

### **Statistics Direct Marketing**

Statistics Direct Marketing helps marketers perform various kinds of analyses easily and confidently, without requiring a detailed understanding of statistics. They can conduct recency, frequency and monetary value (RFM) analysis, cluster analysis, and prospect profiling. They can also improve marketing campaigns through postal code analysis, propensity scoring, and control package testing. And they can easily score new customer data and access pre-built models.

### **Statistics Exact Tests**

Statistics Exact Tests always provides you with correct p values, regardless of your data structure, even if you have a

small number of cases, have subset your data into fine breakdowns or have variables where 80 percent or more of the responses are in one category.

### **Statistics Forecasting**

Improve forecasting with complete time-series analyses, including multiple curve-fitting, smoothing models, methods for estimating autoregressive functions and temporal causal modeling. Use the Expert Modeler to automatically determine

which ARIMA (autoregressive integrated moving average) process or exponential smoothing model best fits your time-series and independent variables, eliminating selection through trial and error.

### **Statistics Missing Values**

If values are missing from your data, this module may find some relationships between the missing values and other variables. In addition, the missing values module can estimate what the value would be if data weren't missing.

### **Statistics Neural Networks**

Use the Statistics Neural Networks module to model complex relationships between inputs and outputs or to discover patterns in your data. Choose from algorithms that can be used for classification (categorical outcomes) and prediction (numerical outcomes). The two available algorithms are Multilayer Perceptron and Radial Basis Function.



### **Statistics Regression**

Predict behavior or events when your data go beyond the assumptions of linear regression techniques. Perform multinomial or binary logistic regression and nonlinear regression, weighted least squares, two-stage least squares and probit analysis.

### **Complementary product**

Use these products with Statistics for Data Analysis to enhance your analytical results.

### **Statistics Amos**

Support your research and theories by extending standard multivariate analysis methods when using this stand-alone software package for structural equation modeling (SEM). Build attitudinal and behavioral models that more realistically reflect complex relationships, because any numeric variable, whether observed or latent, can be used to predict any other numeric variable. The latest release includes a new nongraphical method of model specification that improves accessibility for users who need scripting capabilities and enables large, complicated models to be run more quickly.