What's New in SPSS Statistics 27.0

Analytics plays a vital role in helping your organization achieve its objectives. The SPSS Statistics family delivers the core capabilities needed for end-to-end analytics. To ensure that the most advanced techniques are available to a broader group of analysts, researchers and business users, enhancements have been made to the features and capabilities of the IBM SPSS Statistics portfolio and its many specialized modules.

Following are the new inclusions that have been introduced in the current version of the IBM SPSS Statistics 27 in order to help us cope up with the ever-changing need of the analytics community.

Analyze Procedures

Power Analysis

This option is introduced to help us in determining the optimum sample sizes for a study or project. 11 new procedures have been introduced under this feature. Sometimes when it is difficult to gather information it becomes very important to know the necessary sample size for an acceptable probability of detecting specified effects.

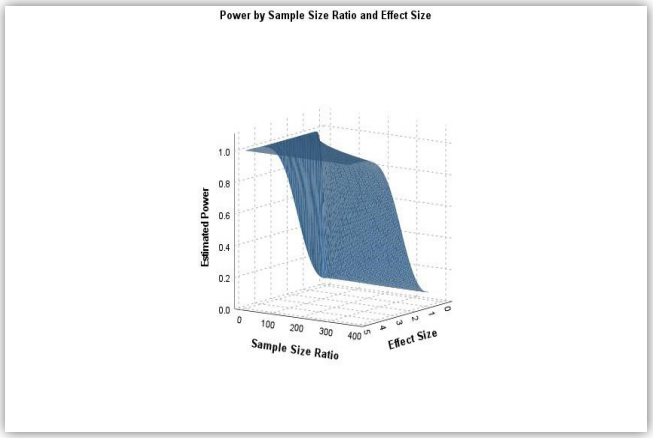
Power Analysis Table

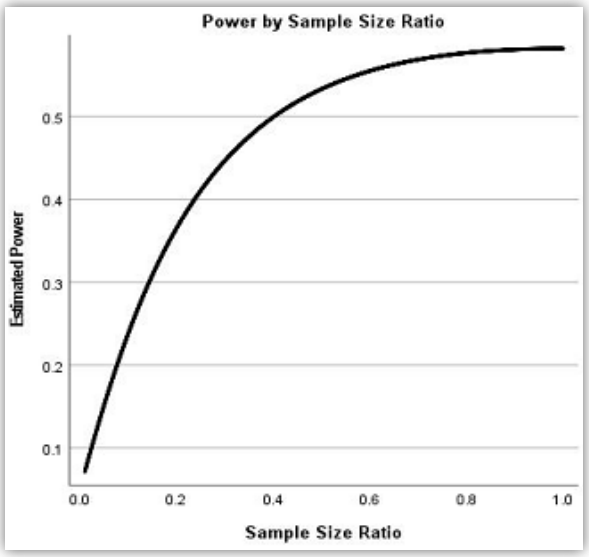
	N	Actual Power[b]	Test Assumptions Power	Std. Dev.	Effect Size	Sig.
Test for Mean[a]	197	.801	.8	.01	.201	.05

a. Two-sided test.

b. Based on noncentral t-distribution.

This feature includes the graphical capabilities for expressing power as a function of sample size and effect size. It includes the 3-dimensional plots also.





There are 11 new procedures that have been introduced in the current version and those are distributed in four submenus. Following are the Power analysis procedures:

Means – One sample t-test, paired sample t-test, independent sample t-test and one-way ANOVA.

Proportions – One sample binomial test, related-samples binomial test and independent samples binomial test.

Correlations - Pearson's product-moment, Spearman's rank-order and partial.

Regression – Univariate linear.

Weighted Kappa procedure

This procedure is also known as Cohen's weighted kappa. This method is widely used in summarizing the inter rater agreement on an ordinal scale. It also helps in understanding the closeness of agreement between raters. In SPSS Statistics 27.0 following weighted versions of Cohen's weighted kappa are being introduced:

Linear weighting

Quadratic weighting

Confidence intervals for all kappa coefficients

Cohen's Weighted Kappa

Ratings	Weighted Kappa[a]	Asymptotic Std. Error[b]	Asymptotic z[c]	Asymptotic Sig.	95% Asymptotic Confidence Interval Lower Bound	95% Asymptotic Confidence Interval Upper Bound
Italy - South Korea	.587	.022	17.388	.000	.543	.631

a. The estimation of the weighted kappa uses linear weights.

b. Value does not depend on either null or alternative hypotheses.

c. Estimates the asymptotic standard error assuming the null hypothesis that weighted kappa is zero.

Procedural Enhancements

Effect Sizes

This version also includes additional effect sizes. This enhancement to the t-test and one-way procedures add effect size estimates and confidence intervals for the following options:
One-sample t-tests, independent-sample t-tests, paired samples t-tests, one-way analysis of variance (ANOVA) and custom contrasts in one-way ANOVA.
Effect size options are available in the procedure setup dialog.

ANOVA Effect Sizes[a]

		Point Estimate	95% Confidence Interval Lower	Upper
Total DVD assessment	Eta-squared	.361	.131	.474
	Epsilon-squared	.309	.060	.432
	Omega-squared Fixed-effect	.306	.060	.428
	Omega-squared Random-effect	.081	.013	.130

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

Quantile Regression enhancements

Apart from the above mentioned ones SPSS Statistics 27 also comes with the user interface improvements for Quantile regression to support a grid of quantiles.

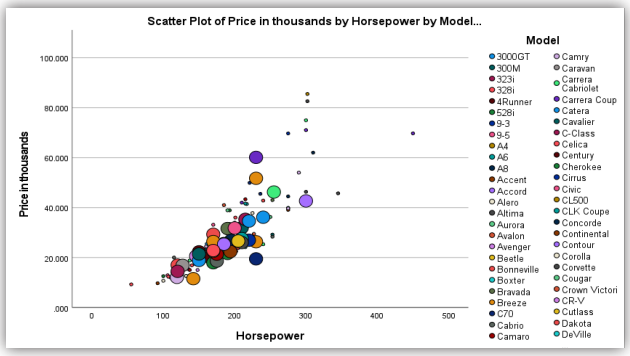
MATRIX enhancements

In order to simplify the programming procedures for the advanced users SPSS Statistics 27.0 includes enhancement to the MATRIX procedure.
This option would reduce the need to use the COMPUTE command.

Output enhancements

Bubble chart

This option included in the scatter plot functionality would help the user bring a new dimension to the reports and visualizations. The size of each bubble or circle is proportional to its value.
These charts are very useful for comparing relationships in the data.



Other Output Enhancements

The new version also helps in generating APA style table output from the popular procedures like crosstabs frequencies etc. This new release also includes some charting enhancements, improving usability of chart builder, charting templates and chart editor.

Everyday Usability Improvements

To make things easier for the users the new version introduces features and functionalities to improve everyday usability and overall productivity.

Search:

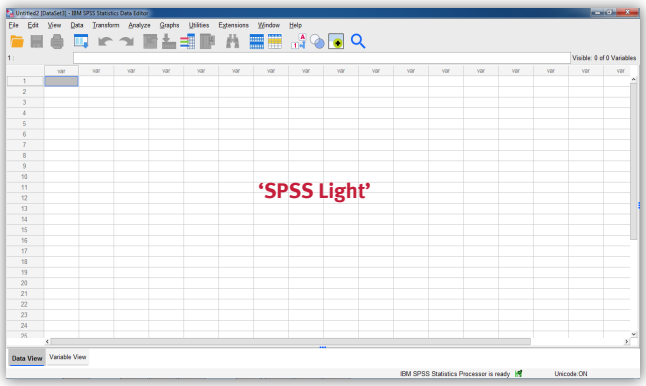
A search option is now introduced in the toolbar. This one would help in finding in-app dialogs, procedures, syntax commands and discover online help resources.

Auto-Recovery:

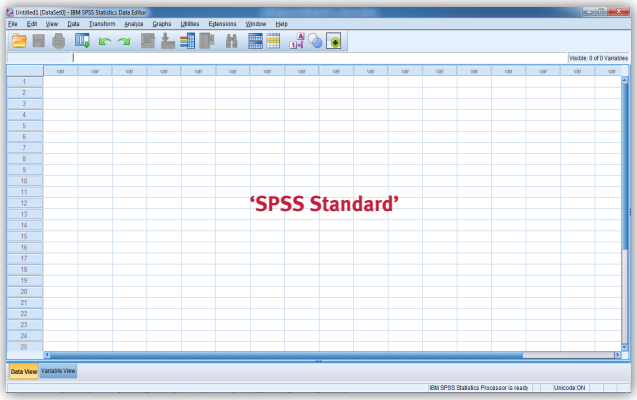
To minimize the risk of data loss a feature has been introduced to automatically save the user – sessions locally.

Other enhancements

'SPSS Light' is now being introduced as the default theme. There is also introduction of some modern application UI theme and color palettes.



Following are the steps to go back to the previous theme:
"Edit -> Options -> Windows -> Look and feel -> 'SPSS Standard'



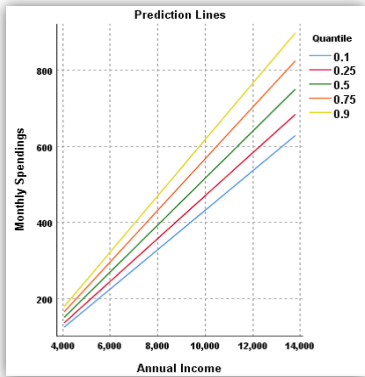
Stability improvements and native macOS experiences are being introduced for the macOS user.
An internet enabled Welcome Screen that will periodically fetch news, products and security updates is also being introduced.

Features added in SPSS 26.0

Quantile Regression:-

This option helps in modelling the relationship between a set of predictor (independent) variables and specific percentiles (or "quantiles") of a target (dependent) variable, most often the median. Quantile regression makes no assumptions about the

distribution of the target variable, tends to resist the influence of outlying observations, and is widely used for researching in industries such as ecology, healthcare, and financial economics.

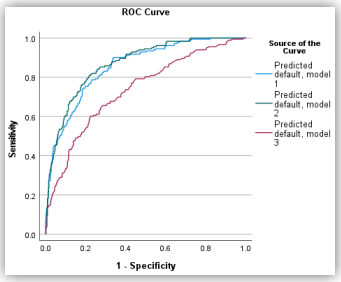


Annual Income	q=0.1	q=0.25	q=0.5	q=0.75	q=0.9
$4,080.9356	125.380	136.792	151.209	165.905	180.071
$13,774.7948	628.295	683.672	750.076	824.412	897.916

a. Dependent Variable: Monthly Spendings

b. Model: (Intercept), Annual Income

ROC Analysis



This option assesses the accuracy of model predictions by plotting sensitivity versus 1-specificity of a classification test (as the threshold varies over an entire range of diagnostic test results).

ROC Analysis supports the inference regarding a single AUC, precision-recall (PR) curves, and provides options for comparing two or more ROC curves that are generated from either independent groups or paired subjects.

Bayesian Statistics

– One-way Repeated Measures ANOVA

Descriptive Statistics of Within-Subject Factor Levels

	Dependent Variables		
	Employment Category	Educational Level (years)	Current Salary
Mean	1.41	13.49	$34,419.57
Std. Deviation	.773	2.885	$17,075.661
N	474	474	474
Min	1	8	$15,750
Max	3	21	$135,000

This new procedure measures one factor from the same subject at each distinct time point or condition, and allows subjects to be crossed within the levels. It is assumed that each subject has a single observation for each time point or condition (as such, the subject-treatment interaction is not accounted for).

Bayes Factor and Test of Sphericity

		Within-Subject Effect
Log Bayes Factor[b]		925.512[a]
Mauchly's Test of Sphericity	Mauchly's W[c]	.000
	Approx. Chi-Square	.
	df	2
	Sig.	.000

a. The Bayes Factor cannot be calculated due to a numerical under- or overflow. Switching to log.

b. The Mauchly's Test uses an equally-spaced polynomial contrast to test the null hypothesis that the error covariance matrix of the orthonormalized transformed dependent variables is proportional to an identity matrix.

c. The Mauchly's Test uses an equally-spaced polynomial contrast to test the null hypothesis that the error covariance matrix of the orthonormalized transformed dependent variables is proportional to an identity matrix.

– One Sample Binomial enhancements

The procedure provides options for executing Bayesian one-sample inference on Binomial distribution. The parameter of interest is ϖ, which denotes the probability of success in a fixed number of trials that may lead to either success or failure. Note that each trial is independent of each other, and the probability ϖ remains the same in each trial. A binomial random variable can be seen as the sum of a fixed number of independent Bernoulli trials.

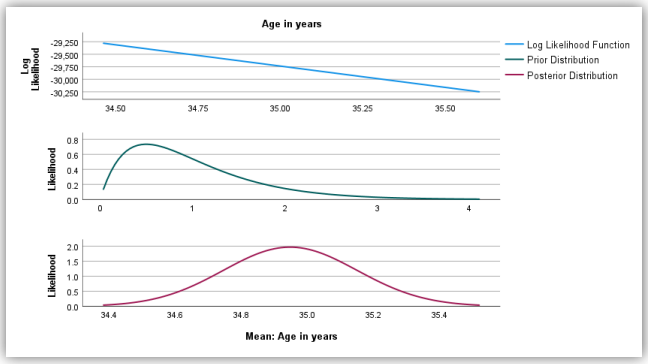
Bayes-Factor for Binomial Proportion Test

		Coin_Toss1
Success Category		= head
N		474
Observed	Successes	237
	Proportion	.500
Bayes Factor		2.223

Bayes factor: Null versus alternative hypothesis.

– One Sample Poisson enhancements

The procedure provides options for executing Bayesian one-sample inference on Poisson distribution. Poisson distribution, a useful model for rare events, assumes that within small time intervals, the probability of an event to occur is proportional to the length of waiting time. A conjugate prior within the Gamma distribution family is used when drawing Bayesian statistical inference on Poisson distribution.



Reliability Analysis

Another procedure had been updated to provide options for Fleiss' Multiple Rater Kappa statistics that assess the inter rater agreement to determine the reliability among the various raters. A higher agreement provides more confidence in the ratings reflecting the true circumstance. The Fleiss' Multiple Rater Kappa options are available in the Reliability Analysis: Statistics dialog.

Overall Agreement[a]

		Overall Agreement
Kappa		.110
Asymptotic	Standard Error	.038
	z	2.910
	Sig.	.004
Asymptotic 95% Confidence Interval	Lower Bound	.107
	Upper Bound	.112

a. Sample data contains 30 effective subjects and 5 raters.

Features added in SPSS Statistics 25.0

- **Execute new Bayesian statistics functions including regression, ANOVA, and t-tests**

  Bayesian statistics is becoming very popular, because it circumvents a lot of the misunderstandings brought by standard statistics. Instead of using a p-value to reject or fail to reject a null hypothesis, Bayesian places an uncertainty on parameters and captures all relevant information from observed data. Our approach to Bayesian statistics is unique because our Bayesian procedures are as easy to run as our standard statistical tests. In just a few clicks you can run Linear Regression, ANOVA, One-Sample, Pair-Sample, Independent-Sample T-tests, Binomial Proportion Inference, Poisson Distribution Analysis, Pair-wise Pearson Correlation, and Log linear models to test the independence of two categorical variables.

- **Quickly create attractive, modern charts and edit them in Microsoft Office.**

  Building modern, attractive, and detailed charts has never been easier. Our chart builder has been updated with the ability to create publication quality charts in just a few clicks. Now you can specify chart colours, titles, and templates as you're building the chart. And, our new default template ensures a great looking chart even without modifications. In addition, now if you wish, you can copy most charts as a Microsoft Graphic Object so you can edit titles, colours, styling, and even chart type right in Microsoft Word, PowerPoint, or Excel. Charting in SPSS has never been this easy. All these charting features are found in the Base editions.

- **Write, edit and format syntax faster with syntax editor shortcuts.**

- **Extend your advanced statistical analysis with updates to MIXED, GENLINMIXED, GLM, and UNIANOVA.**

System Requirements

Operating System

– **IBM SPSS Statistics 27.0 for Windows**

Windows 10 Education, Windows 8.1 Enterprise, Windows 10 Enterprise, Windows 10 Home, Windows 10 Pro, Windows 8.1 Professional, Windows 8.1 Standard

– **IBM SPSS Statistics 27.0 for Mac**

macOS High Sierra 10.13, macOS Mojave 10.14, macOS Catalina 10.15

– **IBM SPSS Statistics 27.0 for Linux**

Red Hat Enterprise Linux (RHEL) 8, Red Hat Enterprise Linux (RHEL) Client 7, Ubuntu 14.04 LTS, Ubuntu 16.04 LTS

Hardware

- **Disk Space -** 4 gigabytes (GB) of available hard-disk space.
- **Display -** 1024*768 or higher screen resolution
- **Memory -** 4 gigabyte (GB) of RAM or more is required, 8 gigabyte(GB) of RAM or more is recommended for 64-bit Client platforms.

Network: adapters, drivers, protocols

- **IPv6 is supported and it is not required.**

Processor

- **1.6 GHz or faster**

Web Browsers

- **Apple Safari**
- **Google Chrome**
- **Microsoft Edge**
- **Mozilla Firefox**

SPSS South Asia (P) Ltd.
No. 2353/1-4, Hennur Main Road
KK Halli, Bangalore - 560043

Phone: +91 80 4112 3945-947
Fax: +91 80 4132 3618
Email: sales@spss.co.in