What's New in SPSS Statistics 26

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.

■ IBM SPSS Statistics 26 continues to increase accessibility to advanced analytics through improved tools, integration, output and ease-of-use features. This release focuses on increasing the analytic capabilities of the software through:

Analyze procedures

■ Quantile Regression

Models 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 tends to resist the influence of outlying observations, and is widely used for researching in industries such as ecology, healthcare, and financial economics.
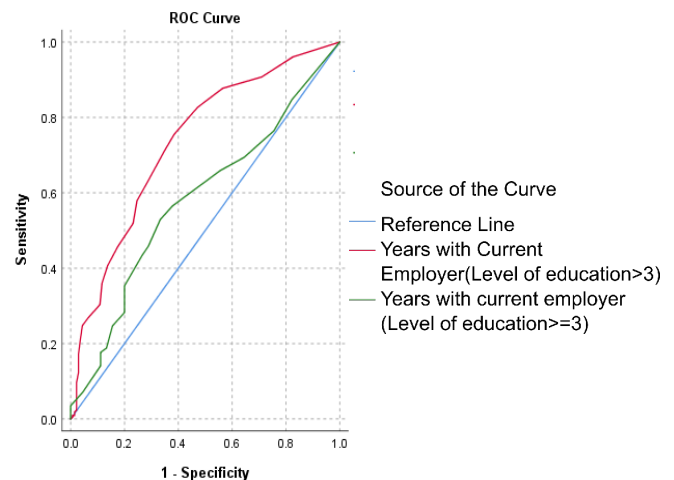
Prediction: Annual Income

Prediction Lines
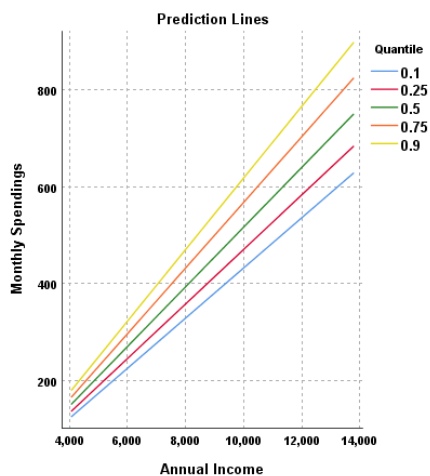
Prediction Table[a,b]

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

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 ROC curves that are generated from either independent groups or paired subjects.

ROC Curve

Source of the Curve
Reference Line
Years with Current Employer(Level of education>3)
Years with current employer (Level of education>=3)

Bayesian Statistics

■ One-way Repeated Measures ANOVA

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).

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

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.
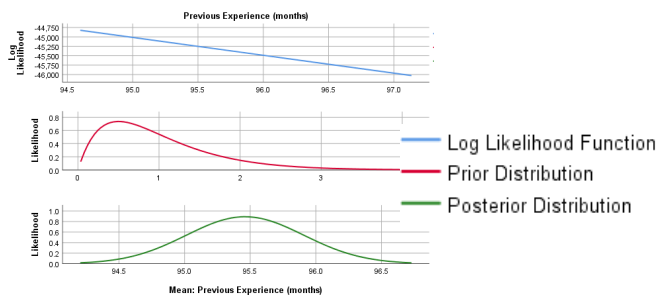
Reliability Analysis

The procedure had been updated to provide options for Fleiss' Multiple Rater Kappa statistics that assess the interrater 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.

Command enhancements

■ MATRIX-END MATRIX command Long variable names (up to 64 bytes) can be used to name a matrix or vector name (such as COMPUTE, CALL, PRINT, READ, WRITE, GET, SAVE, MGET, MSAVE, DISPLAY, RELEASE, and so on).

■ Variable names that are included in a vector or matrix object are truncated to 8 bytes. This is because the matrix/vector structure is an array of numbers, and each number can match a string only up to 8 bytes. Long names (up to 64 bytes) are supported only when explicitly specified.

■ Long variable names are supported in GET and SAVE commands when explicitly specified on the /VARIABLES subcommand (and when specified on the /STRINGS subcommand for the SAVE command). Variable names for GET and SAVE commands are truncated to 8 bytes when they are referenced through a vector in the /NAMES subcommand.

■ The GET, SAVE, MGET, or MSAVE statements support both dataset references and physical file specifications.

■ MATRIX-END MATRIX now supports statistical functions that were previously only supported by the COMPUTE command (for example IDF.CHISQ, CDF.NORMAL, NCDF.F, and so on). GENLINMIXED command

■ New Covariance Type structures ARH1 & CSH, Random Effects. The CSHand ARH1 options were added to the /RANDOM subcommand (keyword COVARIANCE_TYPE).

■ New Covariance Type structures ARH1 & CSH, Repeated Effects. The CSHand ARH1 options were added to the /DATA_STRUCTURE subcommand (keyword COVARIANCE_TYPE).

- Kenward - Roger Degree of Freedom method. The KEN-WARD_ROGER option was added to the /BUILD_OPTIONS subcommand (keyword DF_METHOD).
- Kronecker Covariance types. The options UN_AR1, UN_CS, UN_UN were added to the /DATA_STRUCTURE sub-command (keyword COVARIANCE_TYPE).
- New KRONECKER_MEASURES keyword. The keyword is used for specifying a list of variables for the /DATA_STRUCTURE subcommand. The keyword should be used only when COVARIANCE_TYPE is one of three Kronecker types. The rules for KRONECKER_MEASURES are the same as for REPEATED_MEASURES. When both specifications are in effect, they may or may not have common fields, but cannot be exactly the same (regardless of whether they are in the same order). MIXED command
- DFMETHOD keyword introduced on the CRITERIA sub-command.
- KRONECKER keyword added to the REPEATED subcommand. The keyword should be used only when COVTYPE is one of three following Kronecker types.
- UN_AR1, UN_CS, and UN_UN options added to the COVTYPE keyword on the REPEATED subcommand.

Features Added in SPSS Statistics 25

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, Pairwise Pearson Correlation, and Loglinear 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 colors, 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, colors, 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.

Chartbuilder features new modern default graph

Write, edit and format syntax faster with syntax editor shortcuts
Now with a simple keyboard shortcut you can join lines, duplicate lines, delete lines, remove empty lines, move lines up or down, and trim leading or trailing spaces.

In addition, we're introducing a new column editing mode which allows you to edit multiple lines at once. A killer feature here is the ability to copy data from the data editor (or Microsoft Excel) and paste "down" across multiple lines. It's a great feature – once you try it, you will no longer be able to go back to the earlier syntax editor. These syntax features are found in the Base editions.

Extend your advanced statistical analysis with updates to MIXED, GENLINMIXED, GLM, and UNIANOVA.
We've responded to customer feedback by adding the most requested enhancements to a few of our most popular advanced statistics functions. The Mixed Linear Models (MIXED) & Generalized Linear Mixed Models (GENLINMIXED) procedures now provide random effects solution results (EBLUPs) and continuous time spatial covariance structures. Also, the General Linear Model (GLM) and UNIANOVA procedures have been enhanced with new features including profile plots with error bars, bar/line charts, an option to include grand mean, and an option

to force the chart to include 0 on Y axis. GLM and UNIANO-VA also now include new tests for heteroskedasticity and model specification, robust standard errors, and modified versions of Levene's test.

Enhanced productivity

Improved Chartbuilder
With the enhanced Chartbuilder, you will be able to:
- Display a more accurate preview and make modifications faster, without leaving the Chartbuilder
- Automatically generate chart titles
- Specify custom titles without editing
- Generate a scatter plot with a regression line using new templates

Data editor copy/paste enhancements include:
- Added ability to copy data with variable names or labels
- Added ability to paste data with variable labels

Reasons to upgrade your SPSS
If you're using an earlier version of IBM SPSS Statistics, you'll
gain all of these time saving features, and many more, when you
upgrade to the newest version

Features added in SPSS Statistics 24
- IBM SPSS Statistics Extensions for R, Python, and SPSS Syntax. Extensions provide powerful features for you, the end user, by being a constant stream of new content without requiring a separate purchase or requiring a new product installation.
- Smarter dataset importing and exporting.

Geospatial analytics
- Find trends over time and space using spatio-temporal prediction (STP)
- Create association rules that incorporate geospatial attribute using the generalized spatial association rule (GSAR)

■ System Requirements

IBM SPSS Statistics 26 for Windows
Operating System:
Windows 10 Education, Windows 8.1 Enterprise, Windows 10 Home, Windows 10 Pro, Windows 8.1 Professional, Windows 8.1 Standard, Windows 7 Enterprise, Windows 7 Home Premium, Windows 7 Professional, Windows 7 Starter, Windows 7 Ultimate, Windows 8 Enterprise, Windows 8 Professional, Windows 8 Standard.

IBM SPSS Statistics 26 for Mac
Operating System:
Mac OS Sierra 10.12, OS X El Capitan 10.11, OS X Yosemite 10.10. The product runs natively as a 64-bit application in a 64-bit operating environment.

IBM SPSS Statistics 26 for Linux
Operating System:
Red Hat Enterprise Linux (RHEL) Client 6, Red Hat Enterprise Linux (RHEL) Client 7, Ubuntu 14.04 LTS, Ubuntu 16.04 LTS. The product runs natively as a 64-bit application in a 64-bit operating environment.

Hardware:
Memory: 4 gigabyte (GB) of RAM or more is required, 8 gigabyte (GB) of RAM or more is recommended for 64-bit Client platforms.
Hard Disk: 2 gigabytes (GB) of available hard-disk space.