

# > What's New in SPSS 16.0

SPSS Inc. continues its tradition of regularly enhancing this family of powerful but easy-to-use statistical software products with the release of SPSS 16.0. Besides including features that customers like you have requested, SPSS 16.0 offers a new user interface, written completely in Java™.

The new interface makes SPSS even easier to use. You can resize dialog boxes to accommodate long variable names and lists, and quickly drag and drop variables from one pane to another to set up your analysis.

In addition to the new user interface, SPSS 16.0 offers:

- Significantly expanded analytical capabilities
- Enhanced data management and reporting capabilities
- Improved programmability
- Greater performance and scalability in enterprise applications

And, with this release, virtually the same add-on modules are available whether you use SPSS on a Microsoft® Windows®, Apple® Mac® OS® X, or Linux® platform.\* Going forward, SPSS Inc. plans to make all new features and capabilities to the SPSS product family available on all three platforms simultaneously.

## A new, more flexible user interface

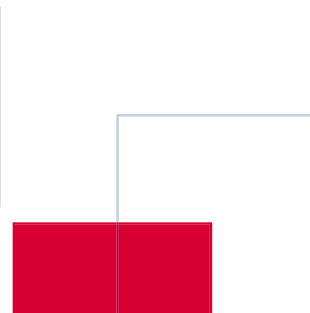
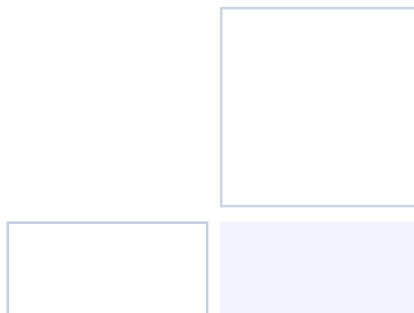
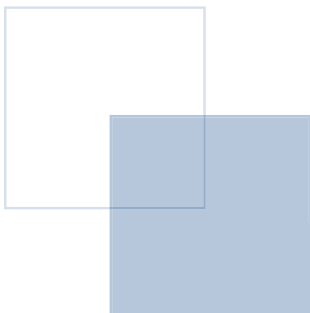
The entire user interface has a new form and functionality in SPSS 16.0. User dialogs, the Data Editor, the Syntax Editor, the Output Viewer, the Help system, the Chart Editor, and the Pivot Table Editor—all have been rewritten in Java. Now, you'll find it even easier to work with your data. You can instantly resize a dialog to see a more complete description of your variables. You can also quickly select and drag the variables you want to use in your analysis.

And if you work with data in multiple languages—as many organizations do—you'll be able to process Unicode data, as well as treat text according to Unicode properties for tasks like sorting and case conversion.

## Introducing SPSS Neural Networks™

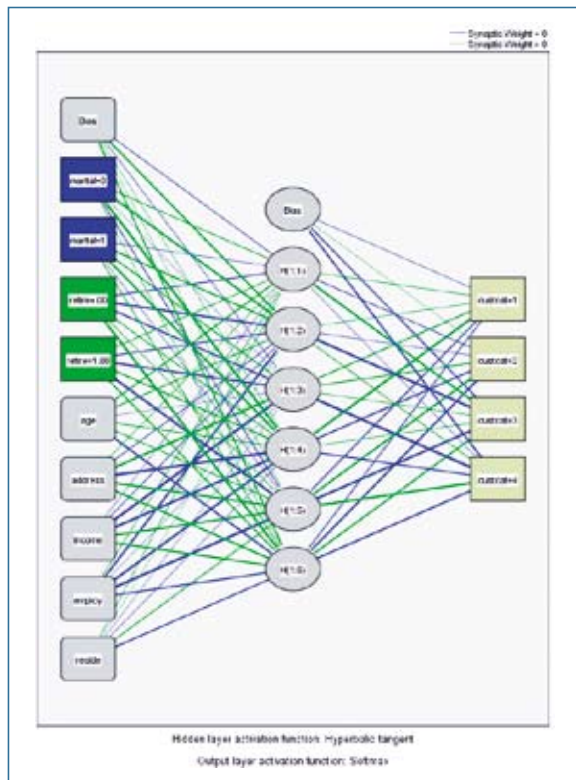
A new add-on module, SPSS Neural Networks, provides a complementary approach to the statistical techniques available in SPSS Base and its modules. From the familiar SPSS interface, you can access SPSS Neural Networks and discover more complex relationships in your data. For example, businesses can forecast consumer demand for a particular set of products, calculate the likely rate of response to a marketing campaign, determine an applicant's creditworthiness, or detect potentially fraudulent transactions.

\* Amos™ and SPSS Exact Tests™ are only available on the Microsoft Windows platform, and the exchange of data with SPSS' Dimensions™ family of survey research products is supported only on the version of SPSS 16.0 that operates on Windows.



Neural networks are non-linear data mining tools that consist of input and output layers plus one or more hidden layers. In a neural network, the connections between neurons have weights associated with them. These weights are iteratively adjusted by the training algorithm to minimize error and provide accurate predictions.

With the SPSS Neural Networks module, you can choose either the Multilayer Perceptron (MLP) or Radial Basis Function (RBF) procedure to explore your data in entirely new ways.



SPSS Neural Networks offers a choice of procedures to discover relationships in your data. This diagram shows a multilayer perceptron (MLP) procedure, with each node linked to other nodes in the input layer, the output layer, and the hidden layer between them.

### New or enhanced statistical techniques

SPSS 16.0 offers enhanced statistical techniques in SPSS Complex Samples™, SPSS Advanced Models™, Amos™, and through the SPSS Programmability Extension™.

SPSS Complex Samples now includes the Cox Regression technique for time-to-event data. If you have data based on a complex sample design, you can use this technique to accurately predict the time to a specific event—how long a high-value customer remains active, for example, or how long people fitting a certain profile will survive a certain medical condition. SPSS Complex Samples Cox Regression (CSCOXREG) enables you to more easily analyze differences in subgroups as well as the effects of a set of predictors. The procedure takes the sample design into account when estimating variances and can handle data involving multiple cases, such as multiple patient visits, encounters, and observations.

SPSS Advanced Models offers additional enhancements to the generalized linear models (GENLIN) and generalized estimating equations (GEE) procedures introduced with SPSS 15.0. These procedures enable you to more accurately predict ordinal outcomes, such as customer satisfaction. Enhancements available in SPSS 16.0 enable analysts to predict outcomes that are a combination of discrete and continuous outcomes—such as claim amounts—using a Tweedie distribution.

Amos, SPSS Inc.’s powerful but easy-to-use tool for structural equation modeling (SEM), now offers latent class analysis and mixture modeling. This statistical method is particularly useful in market segmentation studies when estimating the probability that an individual belongs to a certain segment or cluster is important. This method also provides a useful alternative to k-means cluster analysis.

In the SPSS Programmability Extension, described elsewhere, the current integration plug-ins for Python® and the Microsoft.NET version of Visual Basic® are joined by an integration plug-in for R. This enables analysts to access the wealth of statistical routines created in R and use them within SPSS as part of SPSS syntax.

The SPSS Programmability Extension made possible the introduction in SPSS 16.0 of Partial Least Squares (PLS) regression as an alternative to Ordinary Least Squares (OLS) regression. PLS is a predictive technique that can handle many independent variables, even when they display multicollinearity. Choose PLS instead of OLS if you have a high number of variables relative to the number of cases—a situation that frequently occurs in survey research.

### Enhanced data management and reporting capabilities

In addition to support for Unicode, as already mentioned, SPSS 16.0 includes many enhancements to data management that users have specifically requested. Now you'll have greater flexibility in how you work with, analyze, and save your data. Using SPSS 16.0 capabilities, you can:

- Change the string length or the data type of an existing variable, using syntax
- Define missing values and value labels for data strings of any length
- Choose either to round off or add decimal places to calculated dates when using the Date/Time Wizard
- Benefit from new capabilities in the Data Editor, including the ability to find and replace information, spell check value and variable labels, sort by variable name, type, or format, and more
- Find and replace text in the Output Viewer—for example, search for warnings to identify problems in your output
- Import/export data to and from Excel® 2007
- Suppress the number of active datasets in the user interface
- Set a permanent default working directory

As for reporting, a new, more powerful visualization engine replaces the Interactive Graph Properties (IGRAPH) feature, making graph editing faster and easier. (Existing IGRAPH syntax will continue to work.)

SPSS 16.0 introduces Python as the default front-end scripting language. Python supersedes SAX Basic as the scripting language for tasks such as automation of repetitive tasks and customization of output. As with SAX Basic, you can apply a “base” autoscript to all objects or to individual objects. Existing SAX Basic scripts will continue to work in SPSS 16.0

### Improved programmability

The SPSS Programmability Extension enables you to enhance the capabilities of SPSS by using external programming languages such as Python. Applications written in Python and Visual Basic can also call upon the SPSS backend to conduct analysis or create reports. Integration plug-ins are available at the SPSS Developer Central Web site, as is the SPSS Programmability Extension SDK that allows users to create their own integration plug-ins.

SPSS continues to make the development of APIs easier for users with additional improvements to the Programmability Extension, and now allows the implementation of multiple integration plug-ins and multiple versions of a single integration plug-in.

An additional enhancement available through the SPSS Programmability Extension is the new data step procedure in the SPSS Python integration plug-in. This allows users to create a completely new SPSS data file including the simultaneous creation of defined variables and cases.

Visit SPSS Developer Central at [www.spss.com/devcentral](http://www.spss.com/devcentral) to share code, tools, and programming ideas.

### Greater performance and scalability

SPSS 16.0 features several multithreaded procedures, which result in greater performance on machines containing multiple processors and multi-core processors. The following procedures are multithreaded: in SPSS Base, Linear Regression, Correlation, Partial Correlation, and Factor Analysis; and in SPSS Complex Samples, the SPSS Complex Samples Select procedure.

SPSS 16.0 also provides additional integration with SPSS Predictive Enterprise Services™. As organizations recognize the need to create more effective processes for managing and automating their analytic assets, providing an efficient, cost-effective way to manage and update these assets becomes increasingly important. SPSS Predictive Enterprise Services provides these capabilities for analytical assets created with SPSS—such as syntax, scripts, and output—as well as for assets created with other SPSS products such as the Clementine® data mining workbench.

Enhancements to the SPSS Adapter for Predictive Enterprise Services enable you to store and manage a variety of assets, including Python script files, and enjoy increased performance during retrieval and refresh processes.

To learn more, please visit

[www.spss.com/predictive\\_enterprise\\_services](http://www.spss.com/predictive_enterprise_services).

### System requirements

#### **SPSS Base 16.0 for Windows**

- Operating System: Microsoft Windows XP (32-bit versions) or Vista™ (32-bit or 64-bit versions)
- Hardware:
  - Intel® or AMD x86 processor running at 1GHz or higher
  - Memory: 512MB RAM or more; 1GB recommended
  - Minimum free drive space: 450MB
  - CD-ROM drive
  - Super VGA (800x600) or higher-resolution monitor
  - For connecting with an SPSS Server, a network adapter running the TCP/IP network protocol
- Web browser: Internet Explorer 6

#### **SPSS Base 16.0 for MAC OS X**

- Operating system: Apple Mac OS X 10.4 (Tiger™)
- Hardware:
  - PowerPC or Intel processor
  - Memory: 512MB RAM or more; 1GB recommended
  - Minimum free drive space: 800MB
  - CD-ROM drive
  - Super VGA (800x600) or higher-resolution monitor
- Web browser: Safari™ 1.3.1, Firefox 1.5, or Netscape 7.2
- Java Standard Edition 5.0 (J2SE 5.0)

### SPSS Base 16.0 for Linux

- Operating system: any Linux OS that meets the following requirements\*\*:
  - Kernel 2.4.33.3 or higher
  - glibc 2.3.2 or higher
  - XFree86-4.0 or higher
  - libstdc++5
- Hardware:
  - Processor: Intel or AMD x86 processor running at 1GHz or higher
  - Memory: 512MB RAM or more; 1GB recommended
  - Minimum free drive space: 450MB
  - CD-ROM drive
  - Super VGA (800x600) or a higher-resolution monitor
- Web browser: Konqueror 3.4.1, Firefox 1.0.6, or Netscape 7.2

\*\* Note: SPSS 16.0 was tested on and is supported only on Red Hat Enterprise Linux 4 Desktop and Debian 3.1

### SPSS add-on modules

All SPSS 16.0 add-on modules require SPSS Base 16.0. No other system requirements are necessary.

### Amos 16.0

- Operating system: Windows XP or Windows Vista
- Hardware:
  - Memory: 256MB RAM minimum
  - 125MB or more available hard-drive space
  - Web browser: Internet Explorer 6.0

### SPSS Server 16.0

- Operating system: Windows Server 2003 (32-bit or 64-bit); Sun™ Solaris™ (SPARC) 9 and later (64-bit only); IBM® AIX® 5.3 and later; or Red Hat® Enterprise Linux® ES4 and later; HP-UX Ili (64-bit Itanium)
- Hardware:
  - Minimum CPU: Two CPUs recommended, running at 1GHz or higher
  - Memory: 256MB RAM per expected concurrent user
  - Minimum free drive space: 300MB
  - Required temporary disk space: Calculate by multiplying 2.5 x number of users x expected size of dataset in megabytes

### SPSS Adapter for SPSS Predictive Enterprise Services

- Requires SPSS Base 16.0 and SPSS Predictive Enterprise Services

## Version comparison chart: new features added to SPSS by version number and by area

New feature	Version number	16.0	15.0	14.0	13.0	12.0	11.5	11.0
<b>General</b>								
Desktop versions available on Windows, Mac, or Linux		X						
Resizable dialogs		X						
Drag-and-drop in dialogs		X						
<b>Programmability</b>								
Addition of Python as a “front-end” cross-platform scripting language		X						
Ability to create a data source, including variables and cases, without having to import the active data source into SPSS		X						
Control the flow of your syntax jobs or create your own user-defined algorithms using external programming languages (through the SPSS Programmability Extension)		X	X	X				
Python programming language included on the SPSS CD		X	X					
Ability to create first-class, user-defined procedures		X	X					
Syntax control of output files		X	X					

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New feature	Version number	16.0	15.0	14.0	13.0	12.0	11.5	11.0
<b>Predictive Enterprise</b>								
Several multithreaded procedures for improved performance and scalability		X						
SPSS Adapter for SPSS Predictive Enterprise Services (added in SPSS 14.0.1)		X	X					
Updated PMML to include transformations		X	X					
Single administration utility for SPSS Server, Clementine, and SPSS Predictive Enterprise Services platforms		X	X					
Stripe temporary files over multiple disks for increased performance (in SPSS Server)		X	X					
Conversion-free/copy-free data access in SQL DBMS (in SPSS Server)		X	X	X	X	X	X	X
Data-free client (in SPSS Server)		X	X	X				
Support for Open SSL (in SPSS Server)		X	X	X	X	X		
In-database data preparation (sort and aggregate) to improve performance (in SPSS Server)		X	X	X	X			
Score data using PMML models created with SPSS, Clementine, and AnswerTree® (in SPSS Server)		X	X	X	X			
Predictor Selection and Naïve Bayes algorithms (in SPSS Server)		X	X	X				
<b>Data access and data management</b>								
Improved Data Editor:		X						
Ability to customize variable view		X						
Spell checking for value labels and variable labels		X						
Ability to sort by variable name, type, format, etc.		X						
Unicode support		X						
Import/export Excel 2007 data		X						
Syntax to change string length and basic data type of existing variables		X						
Creation of value labels and missing values on strings of any length		X						
Ability to set a permanent default working directory		X						
Define variable properties tool		X	X	X	X	X	X	
Date and Time Wizard		X	X	X	X			
Export to Database Wizard		X	X					
Direct Microsoft Excel interface		X	X	X	X	X	X	X
Identify Duplicate Cases tool		X	X	X	X	X		
Clone dataset command		X	X	X				
Ability to open multiple datasets within a single SPSS session		X	X	X				
Export data to recent versions of Excel and SAS®		X	X	X	X	X	X	
Long variable names (up to 64 bytes)		X	X	X	X	X		
Very long text strings (up to 32,767 bytes)		X	X	X	X			
Long value labels (up to 120 bytes)		X	X	X				
Custom Attributes for user-defined meta data in the SPSS Data Editor		X	X					
Read recent SAS files		X	X	X	X	X	X	X
Read/write Stata® files		X	X	X				
Export to Dimensions Data Model		X	X					
OLE DB data access (Windows only)		X	X	X				
Restructure Data Wizard		X	X	X	X	X	X	
Visual Binner to easily bin data (for example, break income into “bands” of \$10,000)		X	X	X	X	X		
Optimal Binning (in SPSS Data Preparation add-on module)		X	X					
Subset variable views		X	X					

Version comparison chart: new features added to SPSS by version number and by area

New feature	Version number	16.0	15.0	14.0	13.0	12.0	11.5	11.0
<b>Analysis</b>								
SPSS Neural Networks add-on module		X						
Complex Samples Cox Regression added to SPSS Complex Samples		X						
Latent Class Analysis in Amos		X						
Partial Least Squares regression**		X						
Support for R algorithms**		X						
CATPCA and PROXSCAL (in SPSS Categories™ add-on module)		X	X	X	X	X	X	X
Multiple correspondence analysis (in SPSS Categories add-on module)		X	X	X	X			
Preference scaling (in SPSS Categories add-on module)		X	X	X				
TwoStep cluster analysis (in SPSS Base)		X	X	X	X	X	X	
Descriptive ratio statistics		X	X	X	X	X	X	X
Linear mixed models (also known as hierarchical linear models) (in SPSS Advanced Models add-on module)		X	X	X	X	X	X	X
Generalized linear models (in SPSS Advanced Models add-on module)		X	X					
Generalized estimating equations (in SPSS Advanced Models add-on module)		X	X					
Multinomial logistic regression (in SPSS Regression Models add-on module)		X	X	X	X	X	X	X
Ordinal regression to model ordinal outcomes (in SPSS Base)		X	X					
Receiver-operating characteristic (ROC) analysis (in SPSS Base)		X	X	X	X	X	X	X
SPSS Complex Samples add-on module		X	X	X	X	X		
Complex samples general linear model and logistic regression (in SPSS Complex Samples add-on module)		X	X	X	X			
Complex samples ordinal regression (in SPSS Complex Samples add-on module)		X	X					
SPSS Classification Trees™ add-on module		X	X	X	X			
Validate Data procedure (in SPSS Data Preparation add-on module)		X	X	X				
Anomaly Detection for multivariate outliers (in SPSS Data Preparation add-on module)		X	X	X				
Enhanced SPSS Trends™ add-on module with Expert Modeler		X	X	X				
Bayesian estimation—MCMC algorithm (in Amos structural equation modeling software)		X	X	X				
Data imputation, including multiple imputation (in Amos structural equation modeling software)		X	X	X				
Estimation and imputation of ordered-categorical and censored data (in Amos structural equation modeling software)		X	X					
Run significance tests on multiple response variables, excluding categories used in subtotal calculations (in SPSS Tables™ add-on module)		X	X	X				

Features subject to change based on final product release.

\*\*Available at SPSS Developer Central; requires the SPSS Programmability Extension

## Version comparison chart: new features added to SPSS by version number and by area

New feature	Version number	16.0	15.0	14.0	13.0	12.0	11.5	11.0
<b>Graphs</b>								
Presentation graphics system		X	X	X	X	X		
Chart Builder user interface for graphics		X	X	X				
Support for SPSS Inc.'s Graphics Production Language (GPL)		X	X	X				
Dual-Y axis and overlay charts		X	X					
Enhanced process control charts		X	X					
2-D line charts (both axes can be scale axes) and charts for multiple response sets		X	X	X				
Population pyramids (also called mirror charts or dual charts), 3-D bar charts, and dot charts (also called dot density charts)		X	X	X	X			
Additional chart display features/options, including paneled charts and error bars on categorical charts		X	X	X	X			
<b>Output</b>								
Find and Replace feature in the Output Viewer		X						
Enhanced SPSS Tables module with table preview builder and inferential statistics		X	X	X	X	X	X	
Export output to Microsoft Excel and Word		X	X	X	X	X	X	
Export output to Microsoft PowerPoint®		X	X	X	X			
Export output to PDF		X	X					
Output Management System (turn pivot table output, such as SPSS data files, XML, and HTML, into data/input)		X	X	X	X	X		
Interactive interface for the output management system		X	X	X	X			
Switch output language		X	X	X	X	X	X	
Table to graph		X	X	X	X	X	X	X
<b>Licensing improvements</b>								
Network license reservations and priority settings		X	X	X				
Network commuter license		X	X	X				
License manager redundancy		X	X	X				
<b>Help</b>								
Interactive case studies		X	X	X	X	X	X	X
“SPSS Manuals on CD,” featuring manuals in PDF format for SPSS Base and all add-on modules		X	X	X	X	X		
Statistical Coach™		X	X	X	X	X	X	X
Tutorial		X	X	X	X	X	X	X
Chart tutorial		X	X	X	X			
“What’s This?” (context-sensitive help)		X	X	X	X	X	X	X

Features subject to change based on final product release.

To learn more, please visit [www.spss.com](http://www.spss.com). For SPSS office locations and telephone numbers, go to [www.spss.com/worldwide](http://www.spss.com/worldwide).

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