

SCA[®]

Statistical System

Forecasting and Time Series Analysis for Windows

New Features (Release 8.0)

The SCA System provides many new capabilities and enhancements that are reorganized into packages from Educational to Advanced Editions:

- Time series power transformation analysis and diagnostics
- Improved forecasting using power transformations
- Time-varying parameter models
- Generalized threshold AR and ARIMA modeling
- Segmented time series modeling and forecasting
- GARCH modeling and application environment
- New seasonal ARIMA identification method
- Unit root testing
- Causality tests using vector ARIMA models
- Improved estimation with root checking of ARMA factors
- Date building, handling, indexing, and aggregation

Educational Edition (Academic Users)

The SCA Educational Edition includes essential time series analysis and forecasting capabilities for teaching and learning. It is this fundamental module on which other SCA forecasting and time series products are built. The Educational Edition focuses on time-tested modeling capabilities, providing all the necessary tools to identify, estimate, diagnostically check, and forecast using various time series models.

- Box-Jenkins nonseasonal/seasonal ARIMA modeling
- New identification method for seasonal ARIMA models
- Powerful transfer function modeling and forecasting
- Effective LTF model identification for transfer functions
- Lagged regression with autocorrelated errors
- Intervention (impact) analysis
- Exponential smoothing using various methods
- Time series simulation
- Constrained parameter estimation
- A wide array of capabilities for general statistical analysis
- Large workspace (60,000 words) allocation

Practitioner Edition

The Practitioner Edition builds on the Education Edition by adding expert-system automatic time series modeling and forecasting features. It is easy to use and is an asset to novices and experts alike. In addition, it includes power packed capabilities to automatically detect and adjust for outliers during estimation which is a great tool for time series data mining. The Practitioner Edition offers an effective solution to handle repetitive modeling and forecasting tasks on a large number of time series. It is a natural choice in driving large scale forecasting applications that require automation.

- Automatic identification of seasonal and nonseasonal ARIMA models
- Automatic transfer function modeling and intervention analysis
- Automatic detection and adjustment for outliers using a joint estimation algorithm by C. Chen and L.-M. Liu
- Automatically handles level shifts, temporary changes, additive, and innovational outliers
- Improved estimates of intervention effects through joint estimation of model parameters and outlier effects
- Better forecasting results by special handling of outliers occurring at the end of a time series
- Time series data mining and exploration
- Improve forecasting using power transformation
- Model identification and estimation with missing data
- Trading day and moving holiday adjustment
- Date functions to facilitate daily, weekly, and monthly modeling and forecasting
- Unrestricted workspace allocation

Professional Edition (A)

The Professional Edition (A) builds on the Practitioner Edition by adding multivariate time series analysis and forecasting using vector ARIMA and simultaneous transfer function (STF) models. These advanced modeling approaches are well-suited to business, economic, industrial and social science time series data.

- Analyze and forecast multivariate time series using vector ARIMA models
- Causality tests using vector ARIMA models
- Analyze and forecast multivariate time series using simultaneous transfer function models that accommodate for intervention, trading day and moving holiday effects
- Ideal for the analysis of spatial time series data
- Multivariate time series simulation using vector ARIMA and STF models
- Study contemporaneous effects using structural form models employing STF models, or use reduced form vector ARMA models to leverage lagged dependencies
- Extend upon conventional econometric models by addressing serially correlated errors

Professional Edition (B)

The Professional Edition (B) builds on the Practitioner Edition by adding power transformation, segmented time series methods, nonlinear time series testing, identification, modeling, forecasting using TAR, threshold ARIMA, and threshold transfer function models. Also includes new analysis capabilities for time-varying parameter models and GARCH models.

- New criterion for power transformation to improve forecasting accuracy
- Segmented time series modeling and forecasting using weighted estimation methods
- Effective handling of clustered outliers, and desensitizing parameter estimates from temporary structural changes
- Threshold autoregressive (TAR) and general threshold ARIMA modeling and forecasting
- Piecewise and threshold transfer function modeling and forecasting
- Nonlinearity tests on time series
- Analysis of time-varying parameter models
- GARCH modeling (See SCAB34S GARCH below)
- Model-based seasonal decomposition

Advanced Edition

The Advanced Edition provides SCA's full breadth of capabilities to model and forecast time series data combining the features of Professional Editions (A) and (B).

SCAB34S GARCH

- ARCH, GARCH, GARCH-M, Integrated GARCH, Exponential GARCH, Threshold GARCH, GJR GARCH, GARCH with regressors, Bivariate GARCH, and more
- Normal, student-t, Standard Cauchy, and General Error Distributions
- Advanced diagnostic statistics and graphics
- Generalized nonlinear estimation for custom models
- Comprehensive applet environment providing flexible statistical and mathematical programming.
- Direct two-way interface with other SCA products

SCAB34S SPLINES

- Multivariate Adaptive Regression Splines modeling
- Adaptive Threshold Autoregression (ASTAR) modeling for time series
- General Additive Models (GAM)
- Alternating Conditional Expectation (ACE) modeling
- Simplified model results easily adapted into external scoring systems
- Contribution charts and leverage charts
- Predictive modeling and database scoring capability
- Advanced diagnostic statistics and graphics
- Direct two-way interface with other SCA products

B34S ProSeries Econometric System

The B34S[®] ProSeries Econometric System is a comprehensive software system for econometric modeling and analysis. Among its many features are:

- Includes SCAB34S GARCH and SPLINES products
- PI-spline, ACE, and GAM non-linear modeling
- State space models and non-linear testing of models
- Kalman filtering
- Regression estimation using OLS, GLS, L1 and MINIMAX models
- BLUS and RA analysis, Error component analysis, and Recursive residual analysis
- Principal component analysis and QR model estimation
- LOGIT, PROBIT, TOBIT
- Spectral analysis
- Comprehensive applet development environment and matrix programming language

Basic System Features

- Compatible with Windows Vista, XP, 2000, NT
- Programmable command language
- Interactive menu and batch execution environments
- Import data from spreadsheets and databases
- Automate tasks using SCA macro procedures
- Group a large number of data and analysis tasks into a project file and execute the project as a batch operation
- Graphical menus and dialogs for all SCA commands
- Tabulate time series model information from multiple SCA sessions into consolidated summary tables
- Graphical user interface providing easy-to-use application environments for SCAB34S GARCH, SCAB34S SPLINES, and other SCA components

Time Series Analysis and Forecasting Second Edition (April 2009, release 2.2)

This book is the perfect companion for teaching and research applications. More information on scausa.com

- Autoregressive Integrated Moving Average Models
- Seasonal ARIMA Models
- ARIMA Modeling Using Expert Systems
- Transfer Function Models
- Analysis of Time Series with Calendar Effects
- Intervention Analysis and Outlier Detection
- Forecasting Using Exponential Smoothing Methods
- Time Series Data Mining
- Power Transformations and Forecasting
- Time Series Models with Heteroscedasticity (GARCH)
- Segmented Time Series Modeling and Forecasting Using Weighted Estimation Methods
- Nonlinear Time Series Models
- Multivariate Vector ARMA Modeling and STF Modeling
- Causality tests