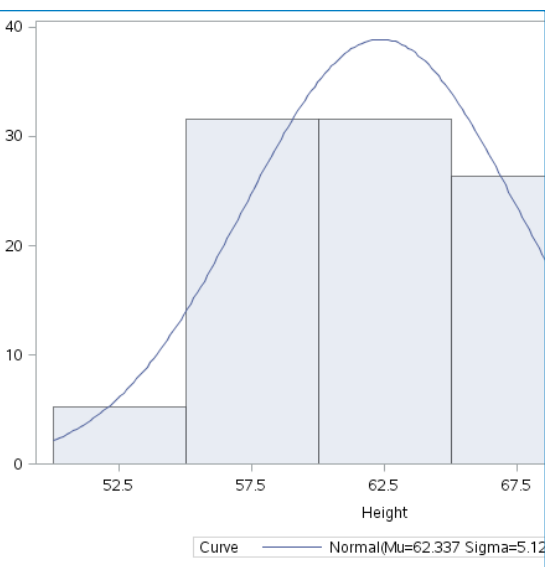


# SAS® University Edition

Free software to expand or advance your career with high-demand analytical skills



## What does SAS® University Edition do?

SAS University Edition is free SAS software that can be used for teaching and learning statistics and quantitative methods. It is useful in such areas as economics, psychology and other social sciences, computer science, business, medical/health and engineering.

## Why is SAS® University Edition important?

Throughout the world both public and private sectors are experiencing a technical analytics skills gap. SAS is helping to build the statistical knowledge needed to fill this gap and provide the workforce with high-demand skills to solve problems with analytics.

## For whom is SAS® University Edition designed?

SAS University Edition is designed for those who want easy access to statistical software to learn and perform quantitative analysis. This includes teachers, professors, students, academic researchers and independent learners.

SAS is known for its commitment to education. To give learners the high-demand skills needed to address the analytics skills gap, our SAS Analytics U global initiative provides free access to SAS software, learning resources, and ways to connect with other SAS users and organizations seeking analytics talent.

As part of this initiative, SAS University Edition offers faster and easier access to learning the most up-to-date statistical methods. This offering is designed for all learners wanting access to statistical software to learn and perform quantitative analysis.

SAS Analytics U includes e-learning classes and training videos, as well as the SAS Analytics U Community, where you can interact with users, share ideas and access more SAS resources.

## Benefits

- **Build your statistical prowess.** With SAS, you can explore and solve important and stimulating problems. Doing so develops analytical skills for instructors to advance statistical research and education, and for students and learners to prepare for rewarding careers in any industry.
- **Easy to access, easy to use.** Download the software yourself, or access it in the cloud via AWS Marketplace (AWS usage fees may apply). Writing and submitting code is easy with a powerful graphical interface to our advanced statistical analysis software. See [sas.com/analyticsu](https://sas.com/analyticsu) to learn more.
- **Tap into a wide array of supportive teaching and learning resources.** In addition to the fully functional software, SAS makes it easy for anyone to learn, teach and stay connected to SAS:
  - o Software users also can access free introductory courses and videos online to learn the basics of SAS programming and statistical analysis and get a jump on using features quickly.
  - o The SAS Analytics U initiative provides an interactive community for SAS users - including chat, support and introductory videos.
  - o Our SAS Global Academic Program offers teaching and curriculum development materials for professors at no cost. Gain huge benefits by participating in this engaging analytics community and preparing yourself for your future - whether in academia, commercial industry or the public sector.

# Overview

SAS University Edition is a great way to start using SAS. SAS University Edition gives you everything you need to perform advanced statistical analysis using the most current statistical and quantitative methods available – with unlimited observations. This includes:

- **Base SAS.** Make programming fast and easy with the SAS programming language, ODS Graphics and reporting procedures.

- **SAS/STAT®.** Trust our proven reliability with a wide variety of statistical methods and techniques.
- **SAS/IML®.** Use this matrix programming language for more specialized analyses and data exploration.
- **SAS Studio.** Reduce your programming time with autocomplete for hundreds of SAS statements and procedures, as well as built-in syntax help. You can use Jupyter Notebook as an alternative interface.

- **SAS/ACCESS®.** Seamlessly connect with your data, no matter where it resides.
- **SAS/ETS®.** Includes time series forecasting procedures: TIMEDATA, TIMESERIES, ARIMA, ESM, UCM and TIMEID.

And for statistical tasks such as linear regression, distribution analysis, correlations and summary statistics, you have the option to use the powerful SAS programming language or select code-generating tasks or process flows through SAS Studio.

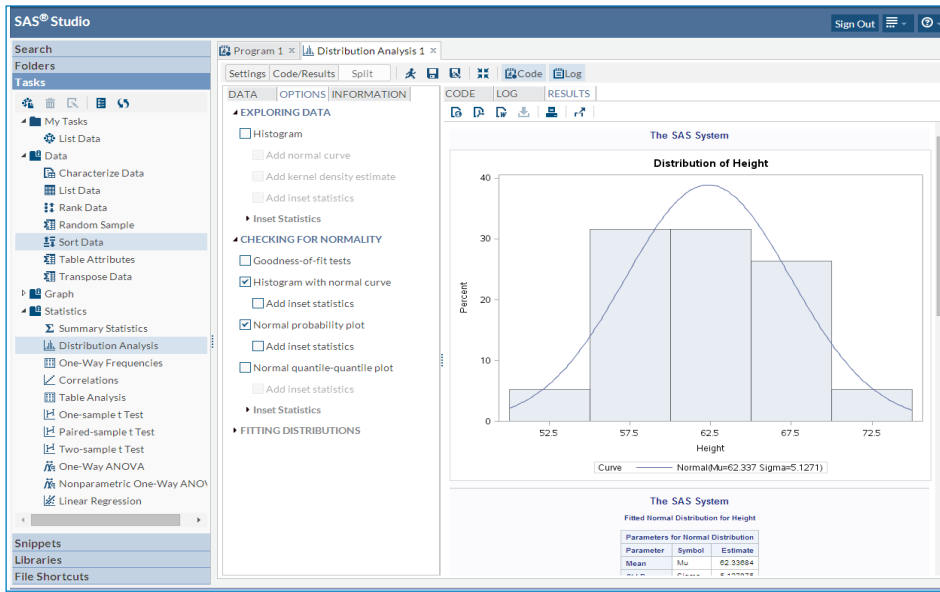


Figure 1: SAS Studio generates SAS code through guided interaction with the user – just select tasks for the code you want to create.

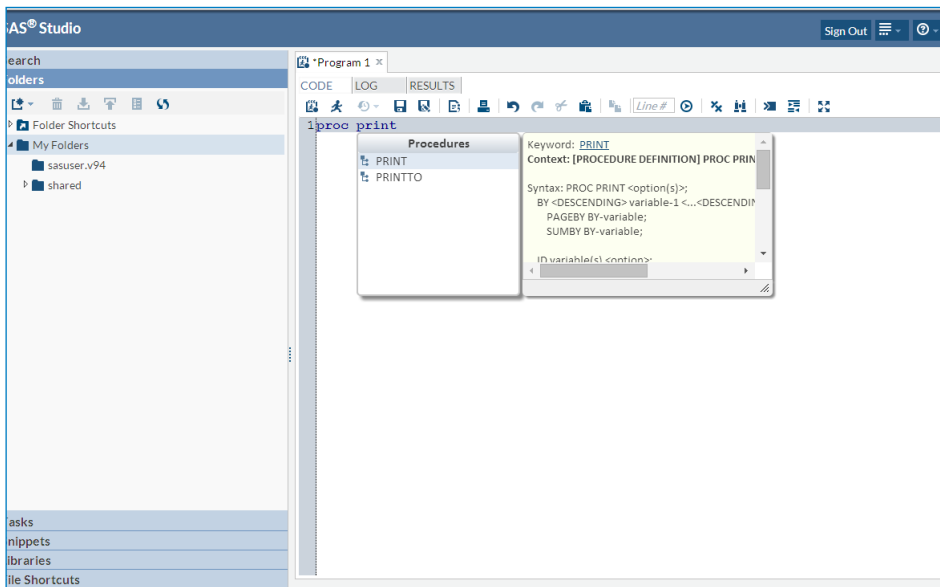


Figure 2: SAS Studio has several features to help reduce your programming time, including autocomplete for hundreds of SAS statements and procedures, as well as built-in syntax help.

SAS maintains rigorous software testing, complete product documentation and numerical validation of its software. Statistical procedures in SAS are constantly being updated to reflect the latest advances in statistical methodology. In addition, technical support is provided by experienced master's- and doctoral-level statisticians who provide industry-leading service.

## Capabilities

### The SAS® Programming Language: Base SAS®

Base SAS is a powerful, versatile software foundation for all SAS University Edition components. With an intuitive programming language that's easy to learn, it significantly reduces the amount of code required to deliver information – increasing your programming productivity.

This highly flexible and extensible fourth-generation programming language has a clear syntax and hundreds of language elements and functions. It supports programming everything from data extraction, formatting and cleansing to data analysis, reporting and information delivery. From small data issues to large complex data problems, users can read, format, analyze and report on data in any format quickly.

Base SAS provides a rich library of encapsulated programming procedures for data manipulation, information storage and retrieval, descriptive statistics and basic analyses (such as correlation, distribution analysis and table analysis), and report writing. You also get ODS Graphics, which includes several procedures designed to

create statistical graphics and the Graph Template Language.

## Reliable Statistical Methods With SAS/STAT®

Statistics is a rapidly expanding discipline, and SAS is leading the way. SAS/STAT provides a comprehensive range of statistical methods that are applicable in higher education, business, research and the public sector. Capabilities include analysis of variance, mixed models, regression, categorical data analysis, Bayesian analysis, multivariate analysis, survival analysis, psychometric analysis, cluster analysis, nonparametric analysis, survey data analysis, multiple imputation, power and sample size computations, and postfitting inference.

Our accelerated release schedule continually delivers more state-of-the-art statistical methods and computational tools, along with numerous enhancements via updates. Documentation with a rich set of introductory examples lets you learn the software quickly and effectively. The clarity and consistency of your statistical output, which includes a wealth of automatically produced graphs, helps you readily understand analysis results. And an extensive process of testing and validation means those results are reliable.

## Matrix Programming With SAS/IML®

SAS/IML gives you a powerful and flexible matrix programming language. You can use SAS products for data manipulation and statistical analysis, and then employ SAS/IML for more specialized analyses and exploration. For example, you can implement a recently devised method that has recently been published in a journal.

You can program easily and efficiently with the many features for matrix expression and an extensive library of statistical and numerical methods. Simple syntax makes it easy to translate mathematical formulas into program statements with features for arithmetic and character expressions. Take advantage of automatic memory management and matrix sizing. No need to declare, dimension or allocate storage for a data matrix; SAS/IML software does this automatically.

## Key Features

### SAS® programming language (Base SAS®)

- Flexible, intuitive 4GL with easy-to-learn syntax.
- SAS macro facility reduces coding for common tasks so you can modularize work for easy reuse and maintenance.
- Data analysis: descriptive statistics, correlations, distribution analysis, table analysis.
- Library of prewritten programming procedures for managing, analyzing and presenting data.
- Ability to read data in any format, from any kind of file, including variable-length records, binary files, free-form data and files with messy or missing data.
- Support for Structured Query Language (SQL).

### Statistical methods (SAS/STAT®)

- Extensive statistical capabilities in over 80 procedures:
  - o Analysis of Variance
  - o Bayesian Analysis
  - o Categorical Data Analysis
  - o Cluster Analysis
  - o Descriptive Statistics
  - o Discriminant Analysis
  - o Distribution Analysis
  - o Exact Inference
  - o Finite Mixture Models
  - o Group Sequential Design and Analysis
  - o Longitudinal Data Analysis
  - o Market Research
  - o Missing Data Analysis
  - o Mixed Models
  - o Model Selection
  - o Multivariate Analysis
  - o Nonlinear Regression
  - o Nonparametric Analysis
  - o Nonparametric Regression
  - o Post Processing
  - o Power and Sample Size
  - o Predictive Modeling
  - o Psychometric Analysis
  - o Quantile Regression
  - o Regression
  - o Robust Regression
  - o Spatial Analysis
  - o Standardization
  - o Structural Equations Models
  - o Survey Sampling and Analysis
  - o Survival Analysis

### Matrix programming (SAS/IML®)

- Interactive matrix programming language.
- Control statements, matrix functions, linear algebra and statistical functions, time series functions, and numerical analysis functions.
- Extensive set of dynamic mathematical and matrix operators.
- Control statements.
- General matrix functions.
- Linear algebraic and statistical functions.
- Time series.
- Numerical analysis.

### Time series forecasting

- Time series analysis and data preparation procedures: TIMEID, TIMEDATA and TIMESERIES.
- Time series modeling procedures for ARIMA, exponential smoothing and unobserved components models.

## An Interactive Interface: SAS® Studio

SAS Studio is the development environment for SAS University Edition; it runs through your web browser. This interface provides an easy way for you to interact with SAS whenever and wherever you are. Write and submit SAS code from any device that supports SAS University Edition – PC, Mac or Linux workstation. It looks the same on all supported devices, which makes it easier to teach and learn.

And if you're not an experienced SAS programmer, or if you need an existing program to help you get started, SAS Studio can help. You can open a table in the table viewer, select which columns to display, and filter and sort the data. Behind the scenes, SAS Studio writes all the code that's needed to display the table and makes that code available to you. You can use Jupyter Notebook as an alternative interface.

## Time Series Forecasting: SAS/ETS®

SAS/ETS lets you address the effects of time dependency on analyses and is useful whenever time dependencies, simultaneous relationships or dynamic processes complicate the analyses. Included are TIMEID, TIMEDATA and TIMESERIES procedures to help with data preparation for your time series analysis and time series modeling procedures for ARIMA, exponential smoothing and unobserved components models.

## Access to PC File Formats With SAS/ACCESS®

SAS/ACCESS Interface to PC Files is a simplified approach for accessing data. It comes ready to use, and provides direct and highly optimized data access and integration between SAS and common third-party PC file formats.

## Key Features (continued)

### Interactive interface (SAS® Studio)

- Helpful programming tools increase productivity with interactive feedback and prompts.
- Pop-up syntax help always available.
- Code-generating tasks to speed development and increase efficiency.
- Browser-based interface for basic data manipulation and basic statistical tasks to generate SAS code.
- Use Jupyter Notebook as an alternative interface.

### Access to PC file formats (SAS/ACCESS®)

- Interface to several PC file types, such as:
  - Microsoft Excel
  - JMP®
  - Paradox
  - SPSS
  - Stata
  - DBF

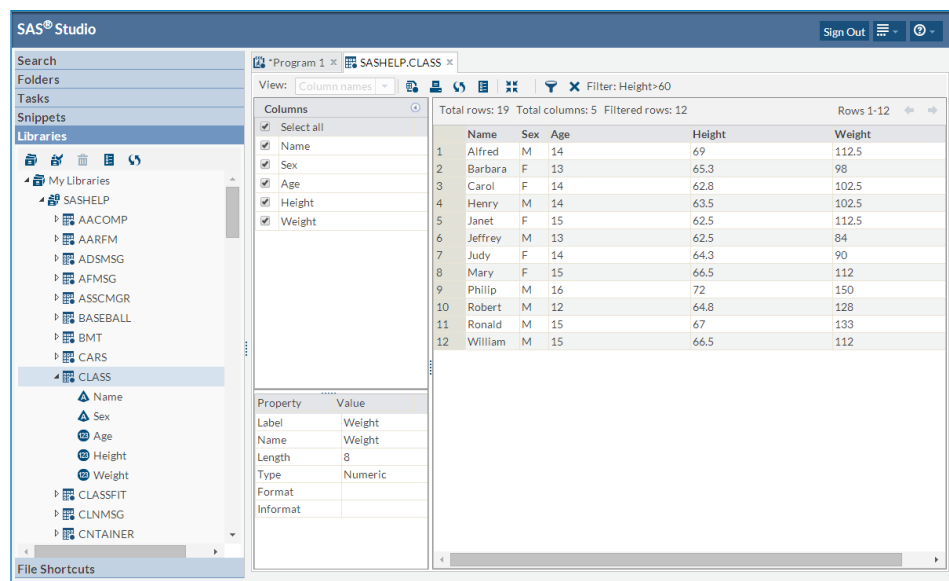


Figure 3: You can open a table in the table viewer, select which columns to display, and filter and sort the data.

You get direct, easy and secure access to data with native interfaces. Import and export popular PC file data such as Microsoft Excel, JMP®, Paradox, SPSS, Stata and DBF. You don't need SQL expertise or custom coding extractions. And there's no need to learn or train on different scripting or query languages.

To learn more and download SAS University Edition, please visit [sas.com/universityedition](https://sas.com/universityedition)

To contact your local SAS office, please visit: [sas.com/offices](https://sas.com/offices)

