Getting Started with Programming in SAS® Studio 3.71

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About This Book

Audience

This book is intended for users who are new to SAS or for experienced programmers who want to learn about SAS Studio. No SAS programming experience is required to use this book.

Requirements

To complete the examples in this book, you must have access to SAS Studio 3.7.

Chapter 1

Introduction to SAS Studio

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Welcome to SAS Studio

Welcome to SAS Studio! This document is a short introduction to SAS Studio and covers how to perform basic SAS 9 programming tasks in SAS Studio. You can follow these steps and use the sample data in the Sashelp library that is shipped with SAS software.

Many people program in SAS by using an application on their PC desktop or SAS server. SAS Studio is different because it is a tool that you can use to write and run SAS code through your web browser. With SAS Studio, you can access your data files, libraries, and existing programs and write new programs. When you use SAS Studio, you are also using SAS software behind the scenes. SAS Studio connects to a SAS server in order to process SAS commands. The SAS server can be a hosted server in a cloud environment, a server in your local environment, or a copy of SAS on your local machine. After the code is processed, the results are returned to SAS Studio.

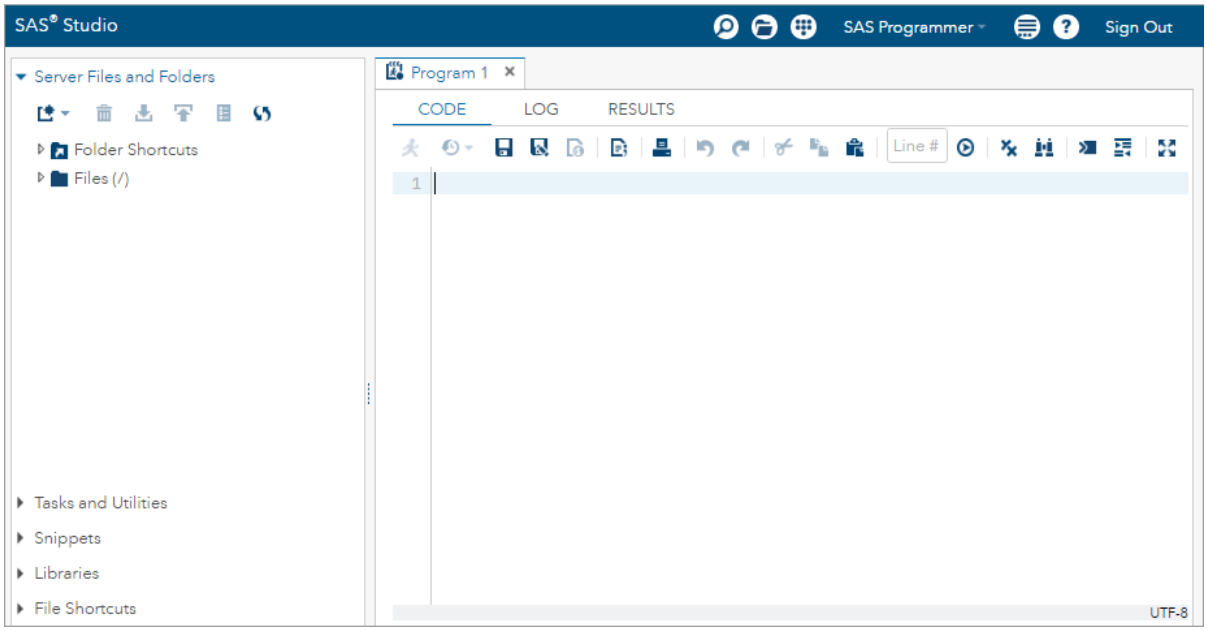
SAS Studio supports multiple web browsers, such as Microsoft Internet Explorer, Apple Safari, Mozilla Firefox, and Google Chrome.

As you work through this document, you will learn how to perform these tasks:

- write a program
- save your results
- correct a programming error
- use the Libraries section to save time
- use SAS Studio to write a program for you

SAS Studio at a Glance

When you sign on to SAS Studio, the main SAS Studio window opens.



The main window of SAS Studio consists of a navigation pane on the left and a work area on the right. The navigation pane provides access to files on your server and your folder shortcuts, your tasks and snippets, the libraries that you have access to, and your file shortcuts. The Server Files and Folders section is displayed by default.

The work area is used to display your data, code, logs, and results. When you first open SAS Studio, the work area displays a new program window. When you open data and run tasks, other windows open in the work area with a tabbed interface.

SAS Studio includes two different perspectives: the SAS Programmer perspective and the Visual Programmer perspective. A perspective is a predetermined set of features that is customized to meet the needs of a specific type of user. This document is about programming in SAS, so you need to make sure that the SAS Programmer perspective is selected on the toolbar at the top of the application. You can find more information about both perspectives in *SAS Studio: User's Guide*.

There are several ways that you can get help with your work in SAS Studio. Pop-up help is available for some options in the application, which you can access by clicking next to the option. Comprehensive help for SAS Studio is available by clicking above the work area and selecting **SAS Studio Help**.

Chapter 2

First Steps in SAS Studio

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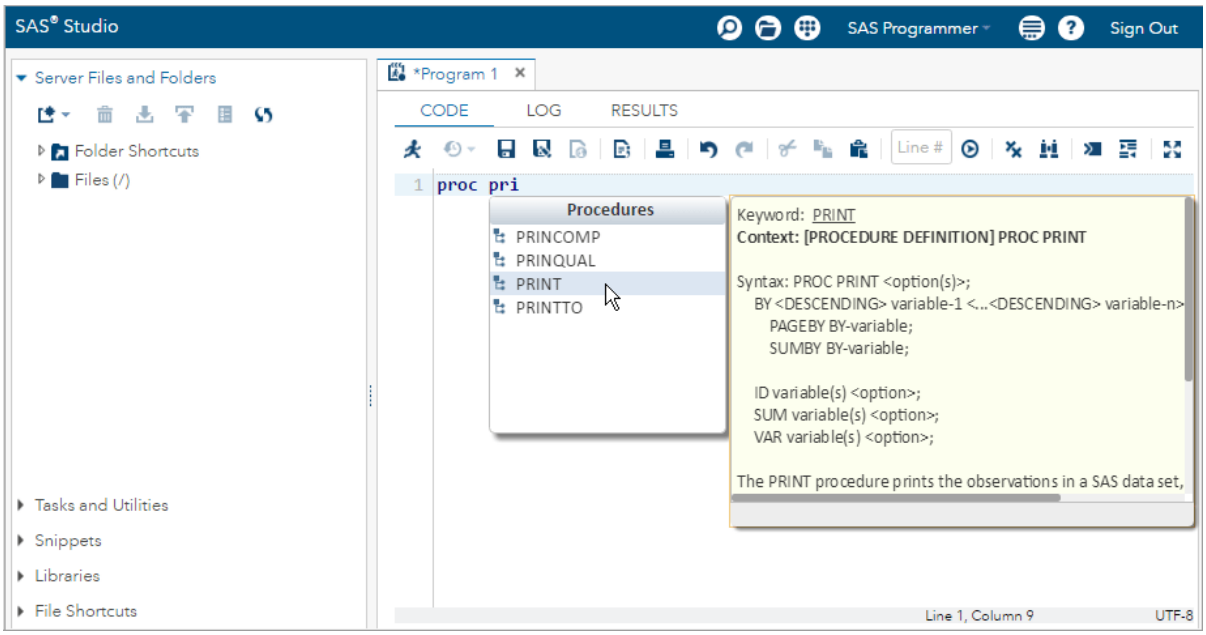
Write a Program

It is easier than ever to program in SAS. All you need to do is open your browser, start SAS Studio, and start writing your program. As you enter your code, you'll notice that SAS Studio has several features to help you reduce your programming time, including autocompletion for hundreds of SAS statements and procedures as well as built-in syntax help that includes links to the more extensive SAS Product Documentation.



To get started, let's write a very simple program that uses a sample SAS table from the Sashelp library. Open SAS Studio and enter the following code in the Program 1 window that is created automatically for you:

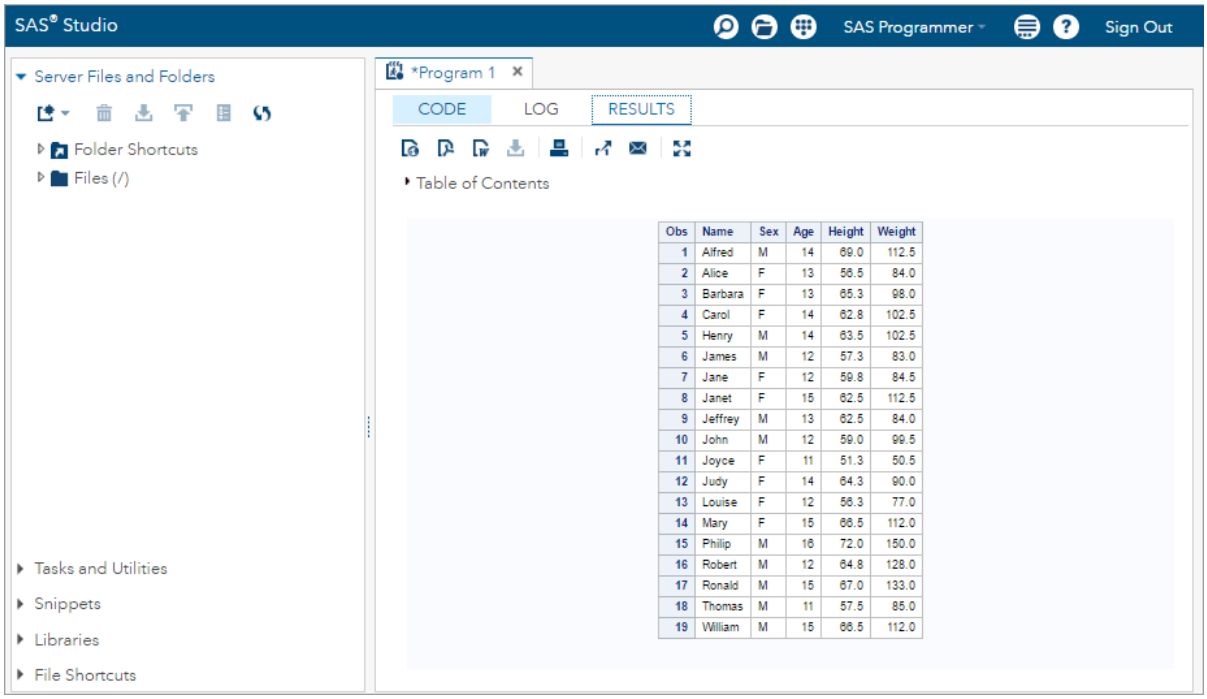
```
proc print data=sashelp.class;
```

```
run;
```

Notice that each SAS statement must end with a semicolon.

Note: If you need to create a new program window, open the Server Files and Folders section of the navigation pane. Then click and select **SAS Program**.

To run the code, click on the toolbar. The **Results** tab opens automatically with a listing of the data in the Class table.



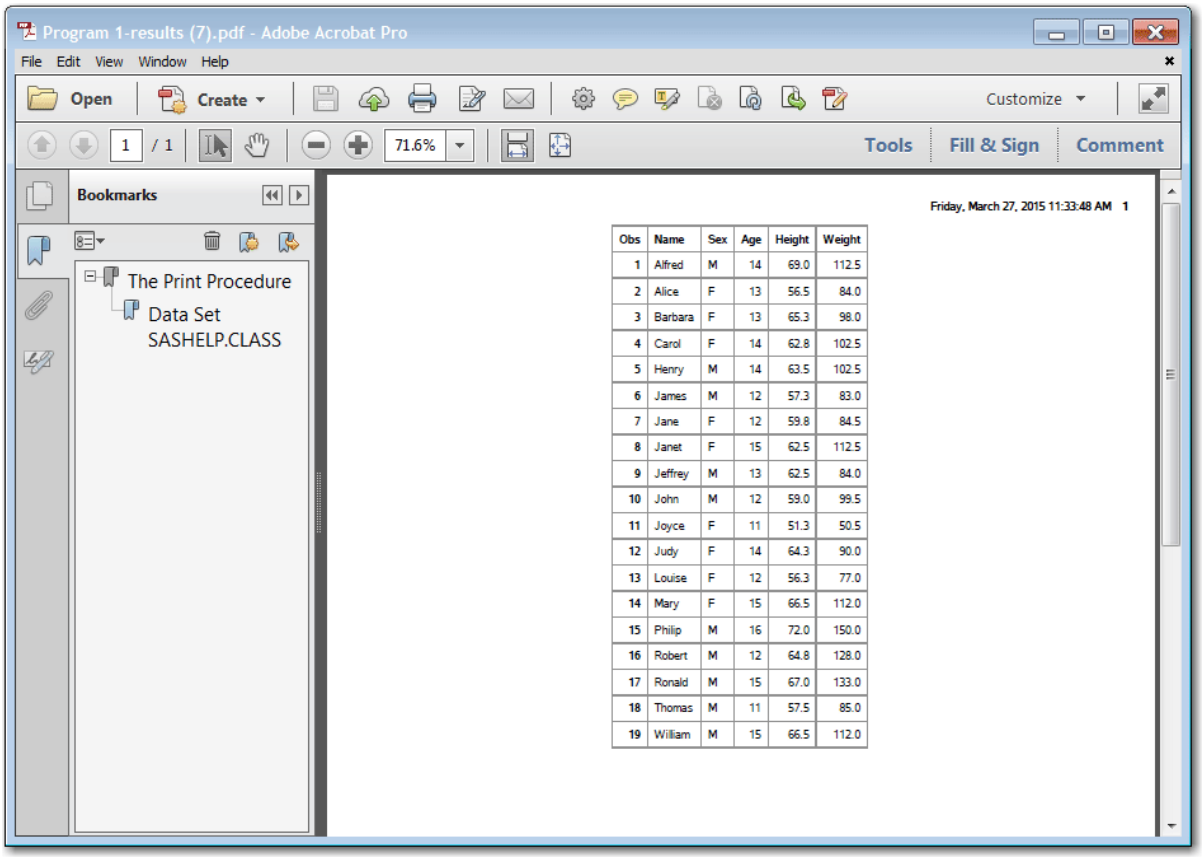
Obs	Name	Sex	Age	Height	Weight
1	Alfred	M	14	69.0	112.5
2	Alice	F	13	56.5	84.0
3	Barbara	F	13	65.3	98.0
4	Carol	F	14	62.8	102.5
5	Henry	M	14	63.5	102.5
6	James	M	12	57.3	83.0
7	Jane	F	12	59.8	84.5
8	Janet	F	15	62.5	112.5
9	Jeffrey	M	13	62.5	84.0
10	John	M	12	59.0	99.5
11	Joyce	F	11	51.3	50.5
12	Judy	F	14	64.3	90.0
13	Louise	F	12	56.3	77.0
14	Mary	F	15	66.5	112.0
15	Philip	M	16	72.0	150.0
16	Robert	M	12	64.8	128.0
17	Ronald	M	15	67.0	133.0
18	Thomas	M	11	57.5	85.0
19	William	M	15	66.5	112.0

Save Your Results

The results in SAS Studio are easy to use, but what if you need them in a different format so that you can share them with someone else? By clicking a button on the **Results** toolbar, you can download your results to any of three different formats and save them or open them in the default application for that format:

- HTML file
- PDF file
- RTF file

In the following example, the results have been downloaded as a PDF file and opened in Adobe Acrobat Reader.



Obs	Name	Sex	Age	Height	Weight
1	Alfred	M	14	69.0	112.5
2	Alice	F	13	56.5	84.0
3	Barbara	F	13	65.3	98.0
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5	Henry	M	14	63.5	102.5
6	James	M	12	57.3	83.0
7	Jane	F	12	59.8	84.5
8	Janet	F	15	62.5	112.5
9	Jeffrey	M	13	62.5	84.0
10	John	M	12	59.0	99.5
11	Joyce	F	11	51.3	50.5
12	Judy	F	14	64.3	90.0
13	Louise	F	12	56.3	77.0
14	Mary	F	15	66.5	112.0
15	Philip	M	16	72.0	150.0
16	Robert	M	12	64.8	128.0
17	Ronald	M	15	67.0	133.0
18	Thomas	M	11	57.5	85.0
19	William	M	15	66.5	112.0

You can also print your results from SAS Studio by clicking . The results open in a separate browser window, and you can then use the default printer controls for that browser.

What If I Have an Error?

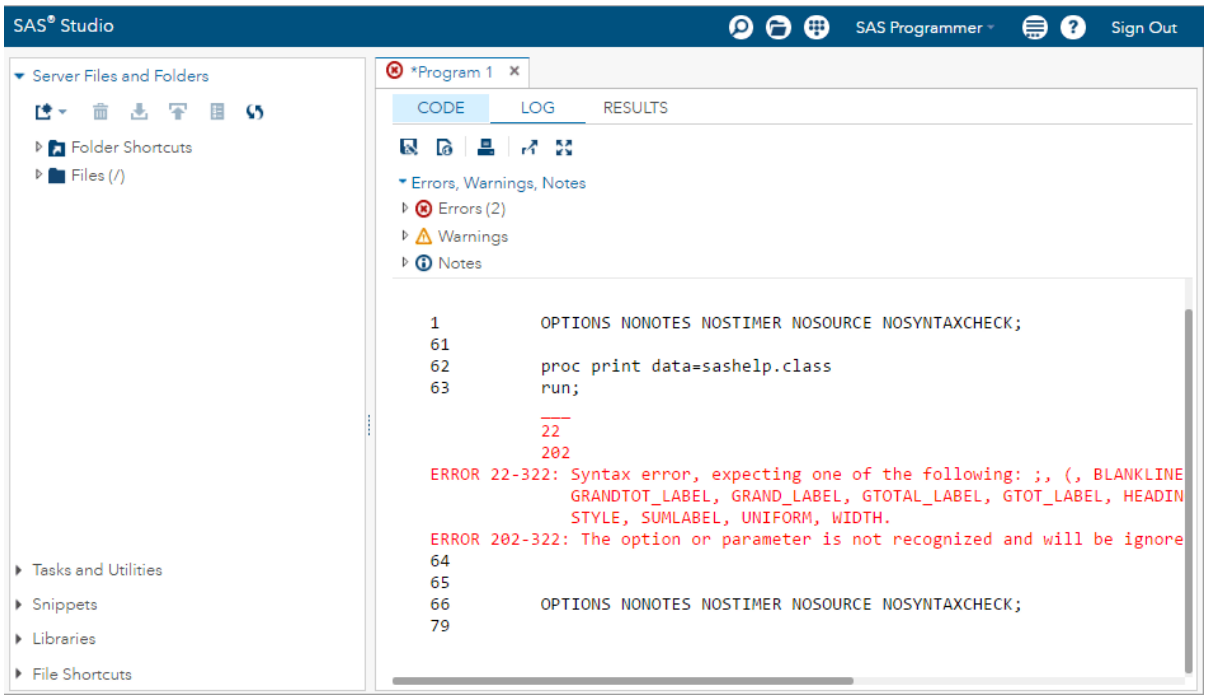
If you have an error in your SAS code, SAS Studio makes it easy to identify the problem. Let's add an error to your original program and see how it works.

Click the **Code** tab to open your program. Delete the semicolon from the first line of the program.

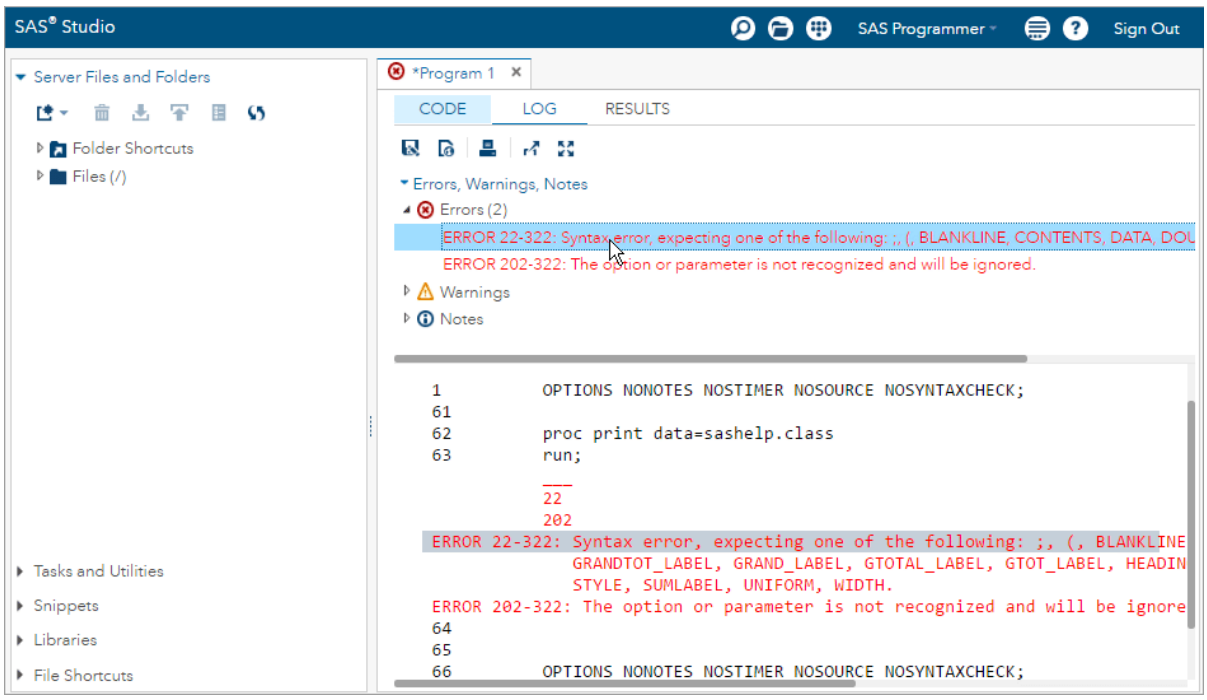
Your program should look like this:

```
proc print data=sashelp.class
run;
```

Click to run the program. This time, the **Log** tab opens automatically to show you that you have an error.

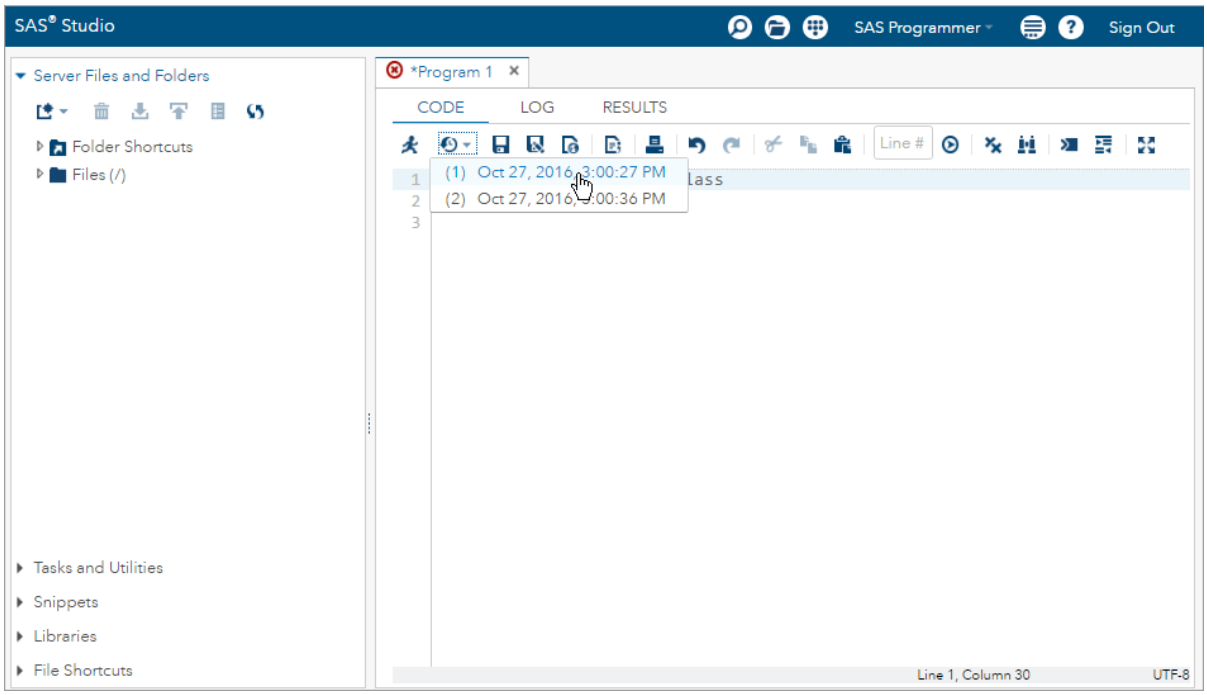


In the Errors, Warnings, Notes section, expand **Errors** to view a description of the error. Click the error message, and SAS Studio highlights it for you in the log so that you can see exactly where the error occurred.



You can return to your program and correct the error. However, if you have a very long and complicated program that has a lot of errors, you might want to return to an earlier version of your program in which you knew all the code was correct. SAS Studio maintains a log, or submission history, with entries for each time you run a program, so you can easily return to an earlier version of a program.

To find an earlier version of your program, click the **Code** tab to view the current version of your program. On the toolbar, click and then click the first version of the program.



The original version of your program opens in a new window from which you can copy and paste the error-free code into your original program or into a new program.

Chapter 3

Save Time with the Libraries Section

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Add Column Names to Your Program

SAS Studio is designed to help you write your SAS programs as quickly and accurately as possible. From the Libraries section of the navigation pane, you can access all of your libraries and the tables in the libraries. If you want to see the names of the columns in a table, you can expand the table and view all of the columns. You can save time when you are writing a program by dragging items from the Libraries section to your program. SAS Studio adds code for the dragged items to your program for you.

To see how this works, let's go back to the original program that you started with:

```
proc print data=sashelp.class;
run;
```

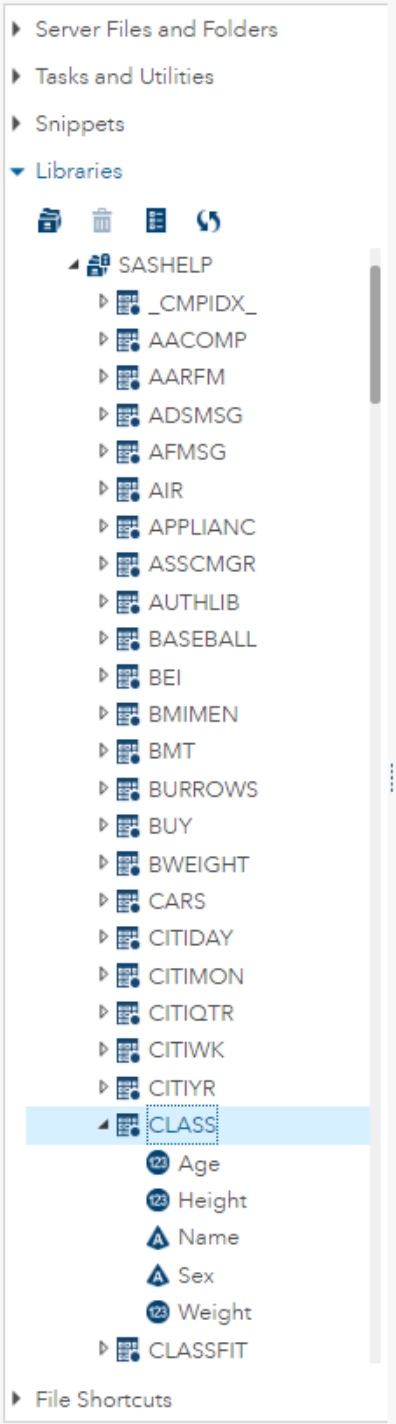
Next, add the VAR statement to the program to specify which variables, or columns, to include in the results. After the first line of code, add the following new line of code:

```
var
```

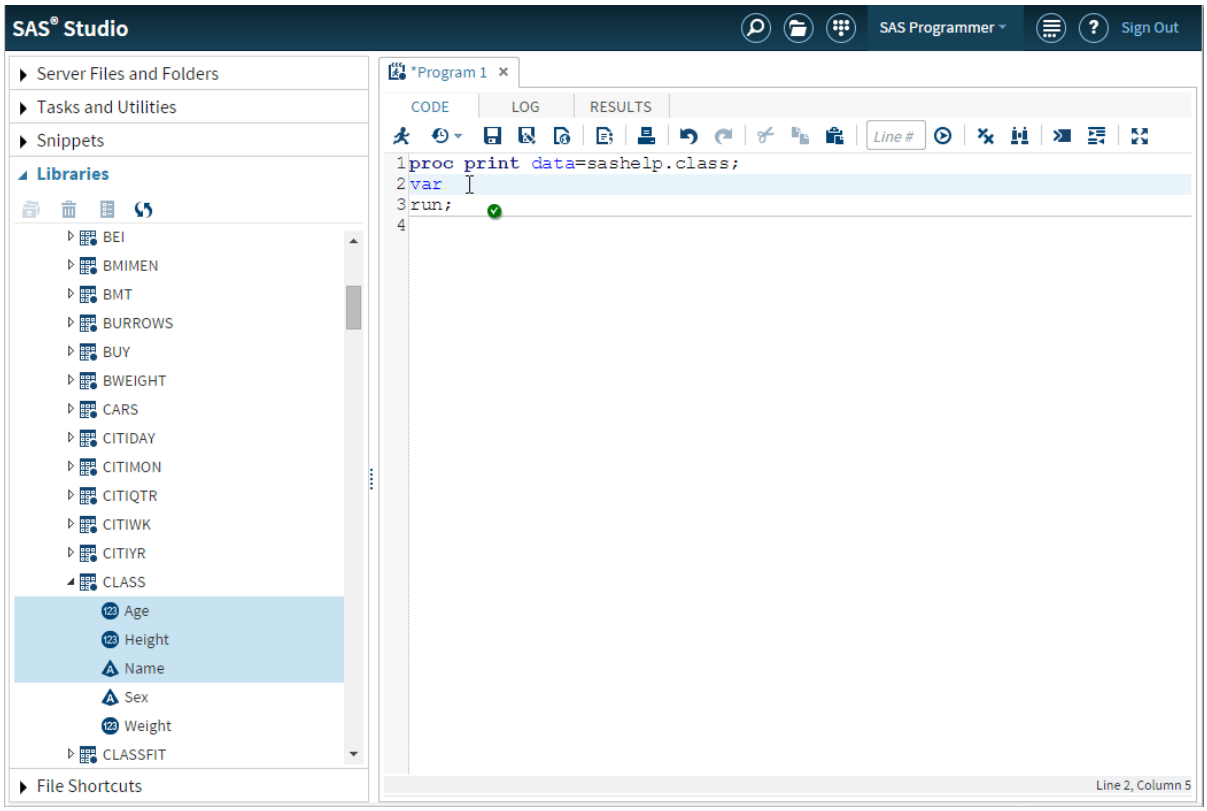
Your program should look like this:

```
proc print data=sashelp.class;
var
run;
```

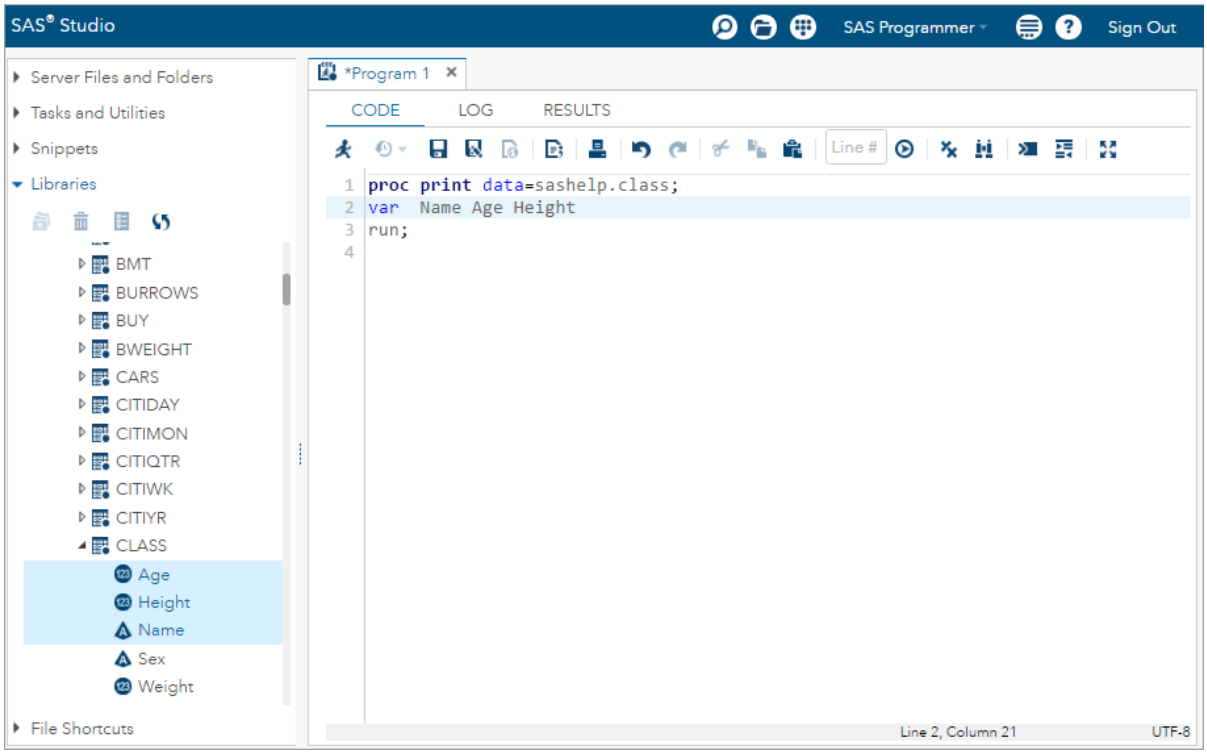
Now you can use the Libraries section to help complete the VAR statement. Click the **Libraries** section in the navigation pane and expand the Sashelp library. Locate the Class table and expand it to view the columns.



Hold down the Ctrl key and select the **Name**, **Age**, and **Height** columns and then drag them to the end of the VAR statement in your program. A green check mark icon indicates where you can drop the selected columns.



When you drop the selected columns, SAS Studio adds the column names to your program. The SAS programming language requires that each statement end with a semicolon. To avoid another error when you run your program, you must add a semicolon to the end of the VAR statement.



By using the Libraries section, you can easily see the names of the columns in a table, and you can save time by dragging table and column names to your programs instead of entering them.

Chapter 4

Use SAS Studio to Generate Your Code

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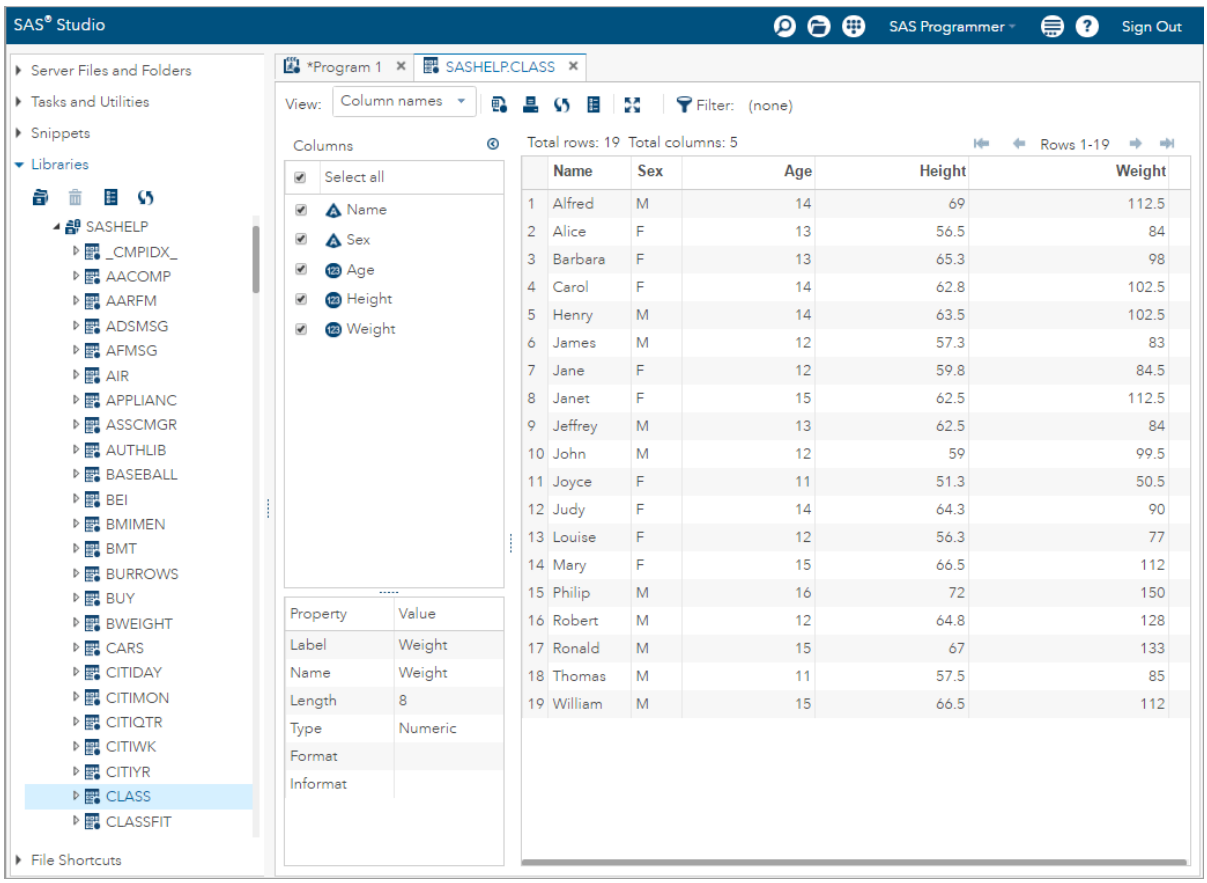
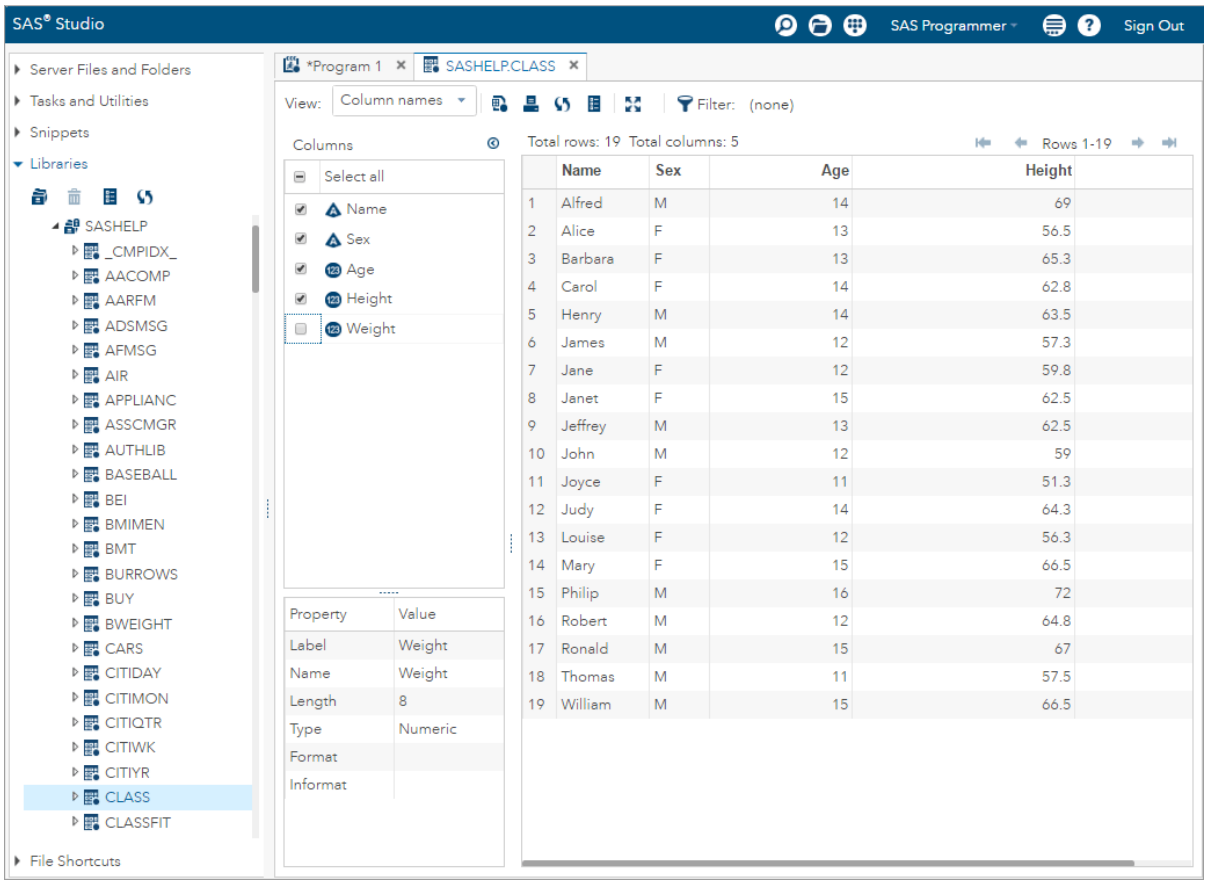
Let SAS Studio Do the Programming for You!

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 is needed to display the table and makes that code available to you.

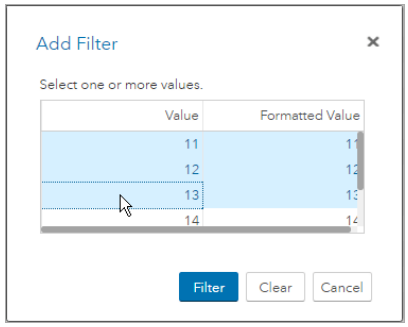
From the Libraries section, double-click the Class table to open it in the table viewer.



In the **Columns** area of the table viewer, all of the columns are selected by default. Clear the **Weight** column and notice that it is immediately removed from the table viewer.

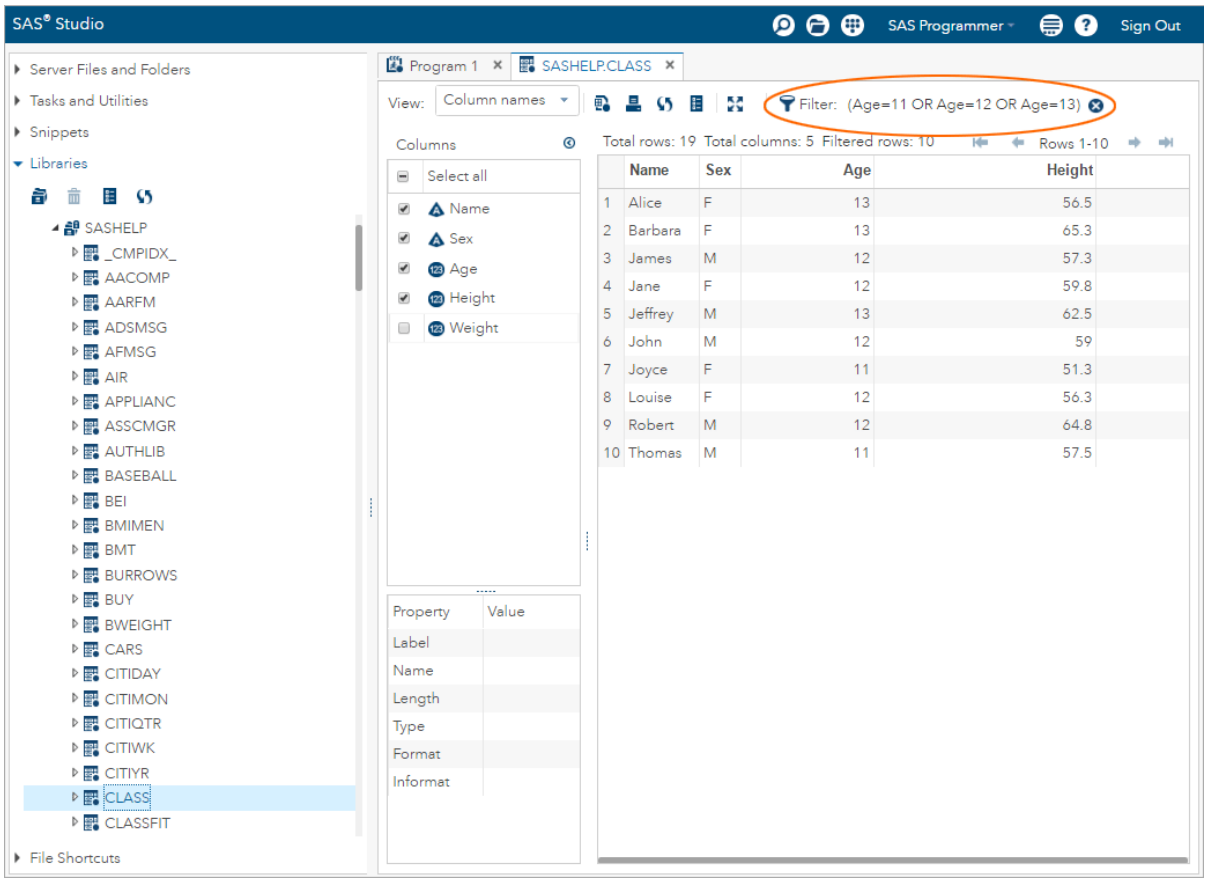


Next, you can add a filter and sort the data. Right-click the **Age** column heading, and select **Add Filter**. From the list of column values, hold down the Ctrl key and select three values: `11, 12, 13`.

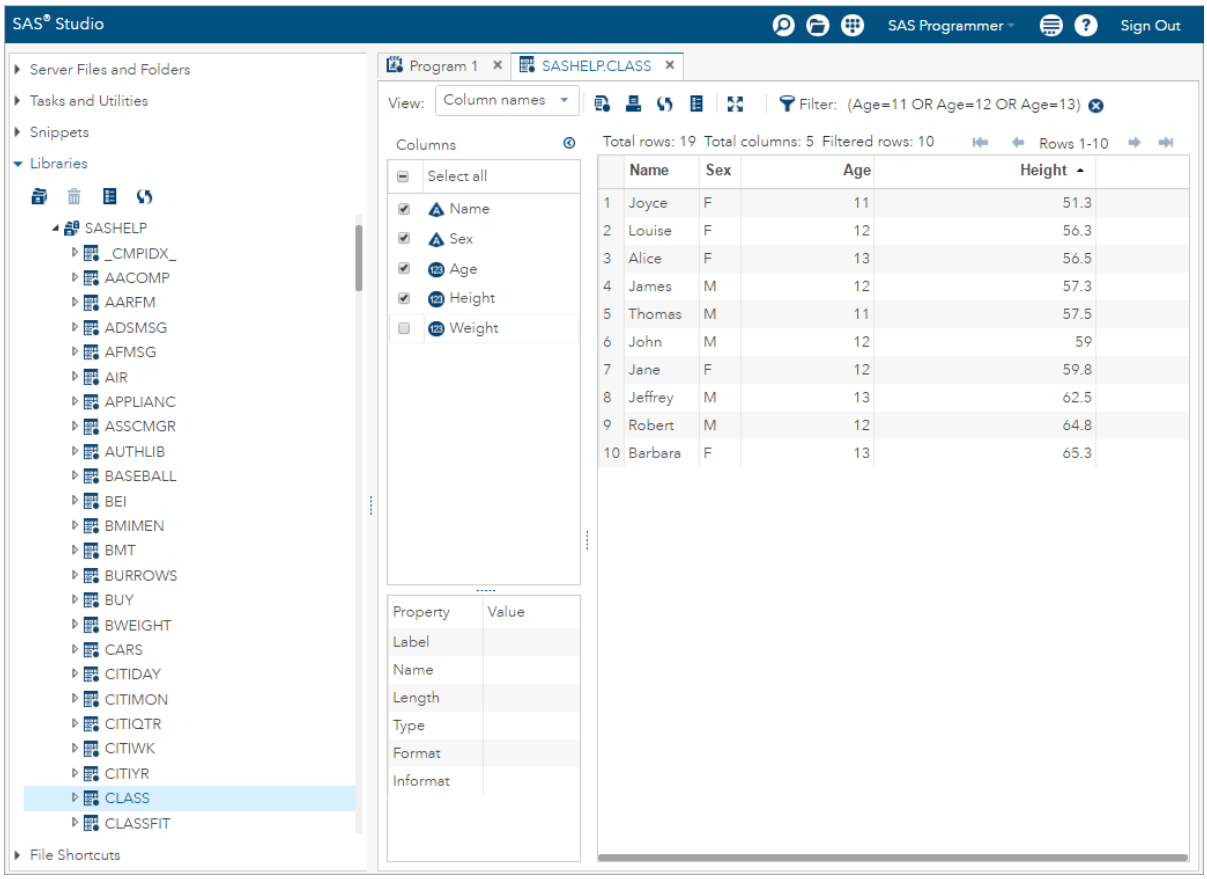


Click **Filter**. The table viewer is updated and now displays only the rows for ages 11, 12, and 13.

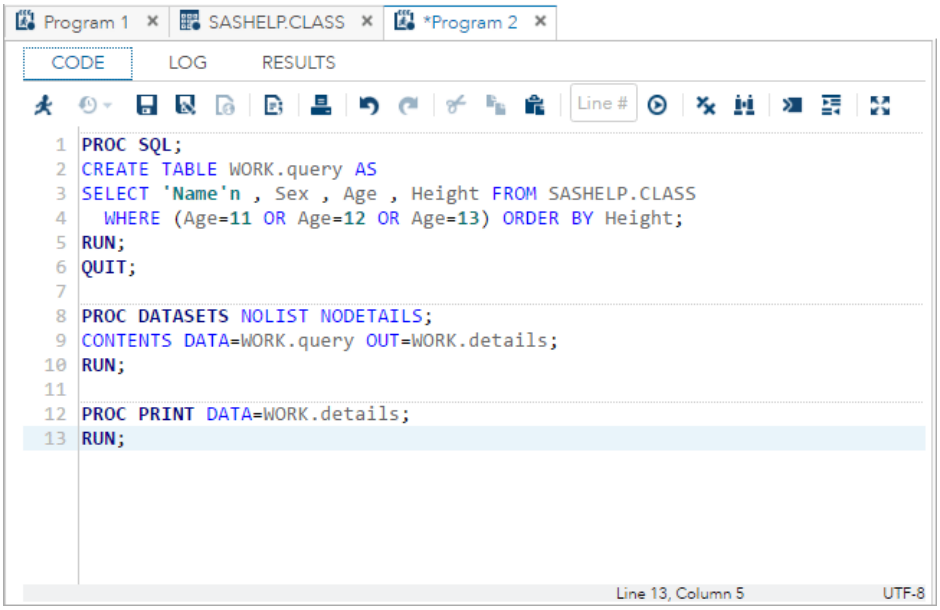
Note: The filter criteria are displayed at the top of the table viewer. You can click to edit the filter and to delete the filter.



Finally, right-click the **Height** column heading and select **Sort Ascending**. The table is sorted by the values of the Height column from smallest to largest.



While you've been selecting options and customizing the table to get it just the way you want it, SAS Studio has been generating SAS code that you can use. To view the code, click on the toolbar. A new program window appears with the code that was used to create the view of the table in the table viewer.



This program is a copy of the code that SAS Studio created and is no longer associated with the table viewer. Editing this program does not affect the data that is displayed in

the table viewer, and modifying the table viewer does not affect the contents of this code. You can edit this code, or use it as the basis for another program.

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For More Information

This document has introduced you to some of the basic features that will help get you started programming in SAS Studio. What you want to learn next depends on how you will be using the software. Remember that extensive help is available from the SAS Studio Help menu and from the SAS Studio Product Documentation page.

Recommended Reading

- *SAS Studio: User's Guide*

For a complete list of SAS publications, go to sas.com/store/books. If you have questions about which titles you need, please contact a SAS Representative:

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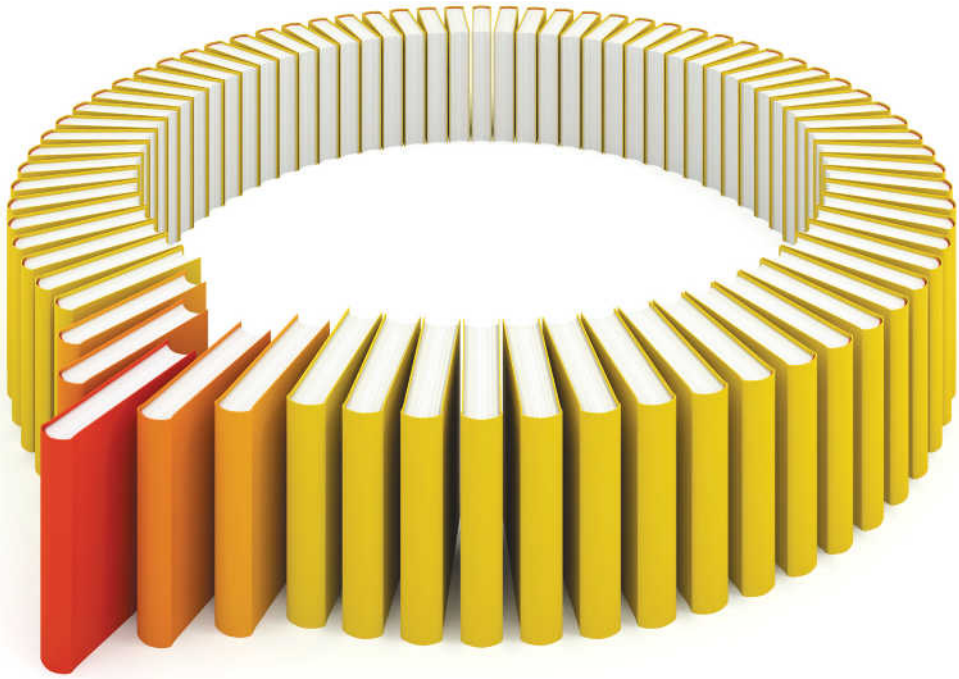

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