



THE
POWER
TO KNOW.

Getting Started with Programming in **SAS® Studio 3.1**

The correct bibliographic citation for this manual is as follows: SAS Institute Inc. 2014. *Getting Started with Programming in SAS® Studio 3.1*. Cary, NC: SAS Institute Inc.

Getting Started with Programming in SAS® Studio 3.1

Copyright © 2014, SAS Institute Inc., Cary, NC, USA

All rights reserved. Produced in the United States of America.

For a hard-copy book: No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without the prior written permission of the publisher, SAS Institute Inc.

For a web download or e-book: Your use of this publication shall be governed by the terms established by the vendor at the time you acquire this publication.

The scanning, uploading, and distribution of this book via the Internet or any other means without the permission of the publisher is illegal and punishable by law. Please purchase only authorized electronic editions and do not participate in or encourage electronic piracy of copyrighted materials. Your support of others' rights is appreciated.

U.S. Government License Rights; Restricted Rights: The Software and its documentation is commercial computer software developed at private expense and is provided with RESTRICTED RIGHTS to the United States Government. Use, duplication or disclosure of the Software by the United States Government is subject to the license terms of this Agreement pursuant to, as applicable, FAR 12.212, DFAR 227.7202-1(a), DFAR 227.7202-3(a) and DFAR 227.7202-4 and, to the extent required under U.S. federal law, the minimum restricted rights as set out in FAR 52.227-19 (DEC 2007). If FAR 52.227-19 is applicable, this provision serves as notice under clause (c) thereof and no other notice is required to be affixed to the Software or documentation. The Government's rights in Software and documentation shall be only those set forth in this Agreement.

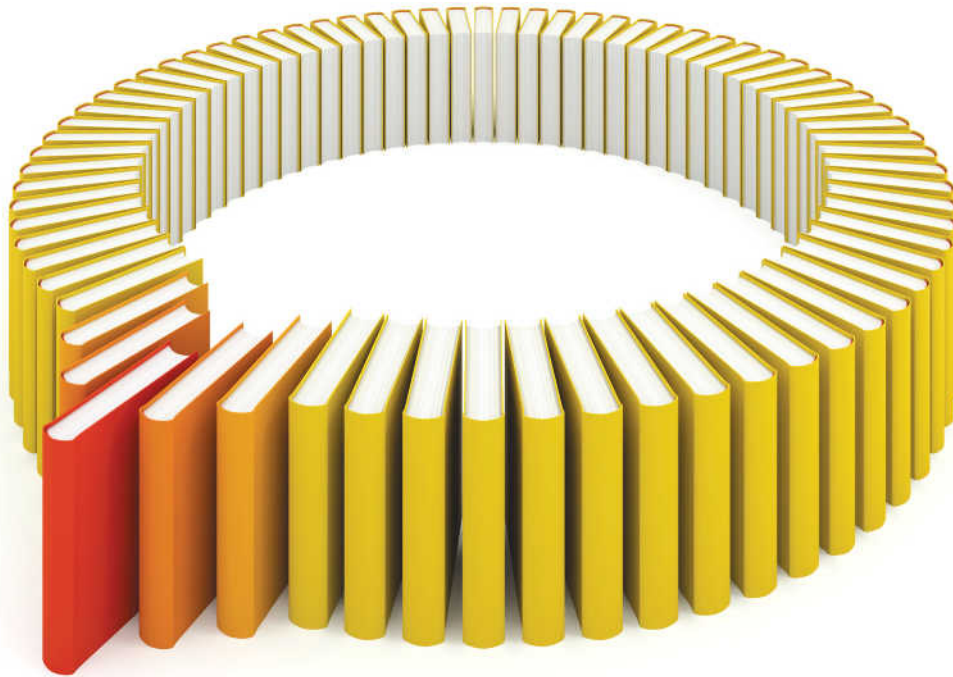
SAS Institute Inc., SAS Campus Drive, Cary, North Carolina 27513-2414.

March 2014

SAS provides a complete selection of books and electronic products to help customers use SAS® software to its fullest potential. For more information about our offerings, visit support.sas.com/bookstore or call 1-800-727-3228.

SAS® and all other SAS Institute Inc. product or service names are registered trademarks or trademarks of SAS Institute Inc. in the USA and other countries. ® indicates USA registration.

Other brand and product names are trademarks of their respective companies.



Gain Greater Insight into Your SAS[®] Software with SAS Books.

Discover all that you need on your journey to knowledge and empowerment.

 support.sas.com/bookstore
for additional books and resources.


THE POWER TO KNOW.

SAS and all other SAS Institute Inc. product or service names are registered trademarks or trademarks of SAS Institute Inc. in the USA and other countries. ® indicates USA registration. Other brand and product names are trademarks of their respective companies. © 2013 SAS Institute Inc. All rights reserved. S107969US.0613

Contents

<i>About This Book</i>	<i>vii</i>
<i>Accessibility</i>	<i>ix</i>
<i>Recommended Reading</i>	<i>xi</i>
Chapter 1 • Introduction to SAS Studio	1
Welcome to SAS Studio	1
SAS Studio at a Glance	2
Chapter 2 • First Steps in SAS Studio	5
Write a Program	5
Save Your Results	6
What If I Have an Error?	7
Chapter 3 • Save Time with the Libraries Section	11
Add Column Names to Your Program	11
Chapter 4 • Use SAS Studio to Generate Your Code	15
Let SAS Studio Do the Programming for You!	15
Chapter 5 • Additional Information	19
For More Information	19

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 3.1.

Accessibility

For information about the accessibility of this product, see [Accessibility Features of SAS Studio 3.1](https://support.sas.com) at support.sas.com.

Recommended Reading

- *SAS Studio: User's Guide*

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

SAS Books
SAS Campus Drive
Cary, NC 27513-2414
Phone: 1-800-727-3228
Fax: 1-919-677-8166
E-mail: sasbook@sas.com
Web address: support.sas.com/bookstore

Chapter 1

Introduction to SAS Studio

Welcome to SAS Studio	1
SAS Studio at a Glance	2

Welcome to SAS Studio

Welcome to SAS Studio! This document is a short introduction to SAS Studio and covers how to perform basic 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.



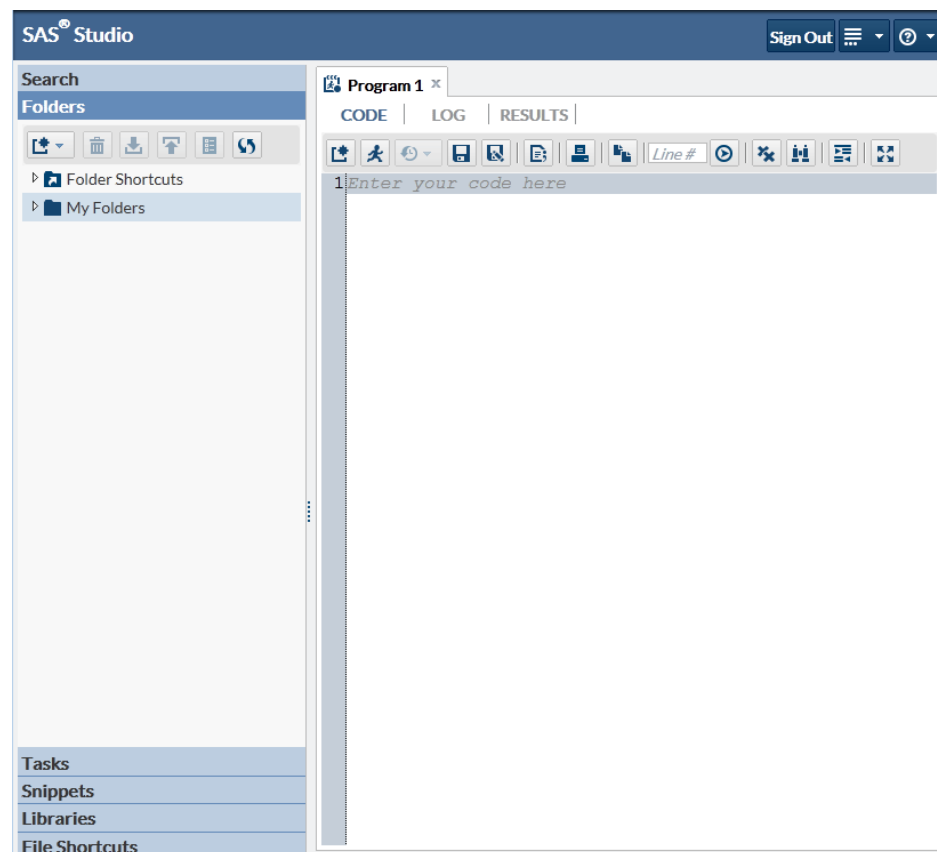
SAS Studio supports multiple web browsers, such as Microsoft Internet Explorer, Apple Safari, Mozilla Firefox, and Google Chrome.

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 appears.



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 the search feature, your folders and folder shortcuts, your tasks and snippets, the libraries that you have access to, and your file shortcuts. The 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.

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**.

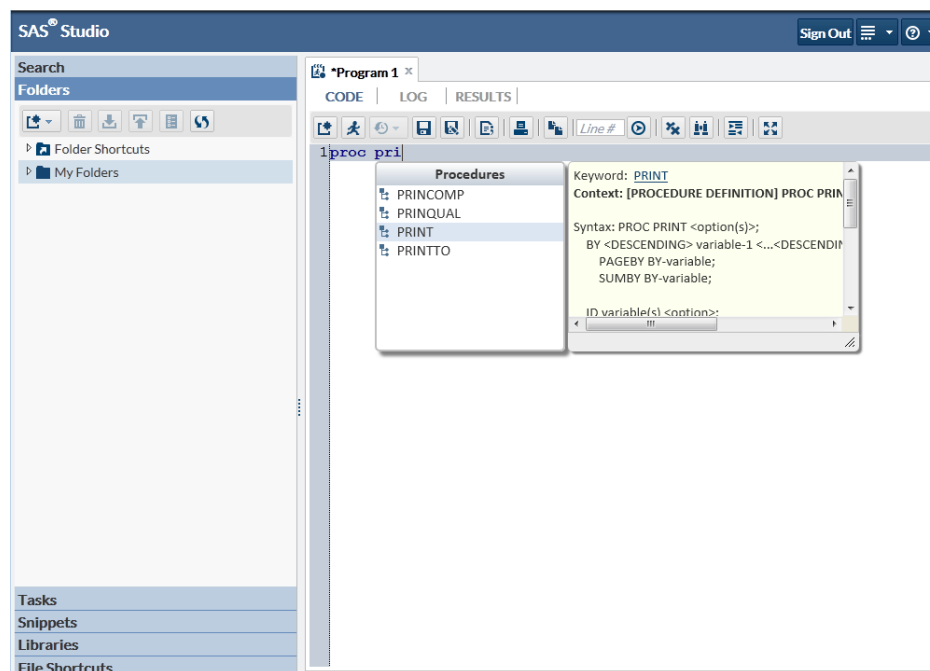
Chapter 2

First Steps in SAS Studio

Write a Program	5
Save Your Results	6
What If I Have an Error?	7


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 autocomplete for hundreds of SAS statements and procedures as well as built-in syntax help that includes links to the more extensive SAS Product Documentation.

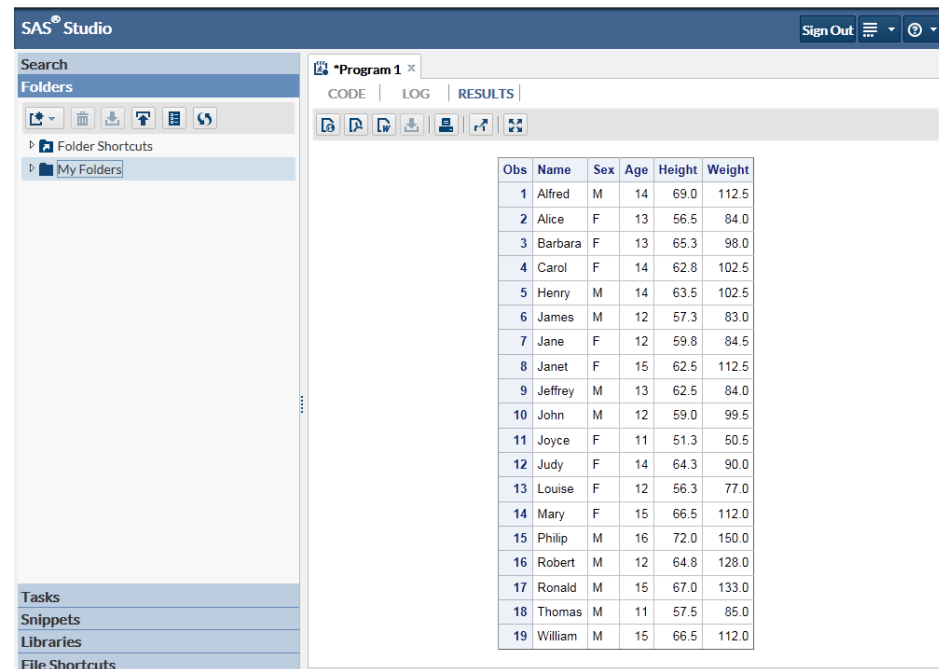


To get started, let's write a very simple program that uses a sample SAS table from the Sashelp library. Open SAS Studio and enter the following code in the Program 1 window that is created automatically for you:

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

Note: If you need to create a new program window, open the 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.



The screenshot shows the SAS Studio interface. On the left is the navigation pane with 'Folders' and 'My Folders'. The main window is titled '*Program 1' and has tabs for 'CODE', 'LOG', and 'RESULTS'. The 'RESULTS' tab is active, displaying a table of data from the sashelp.class dataset.

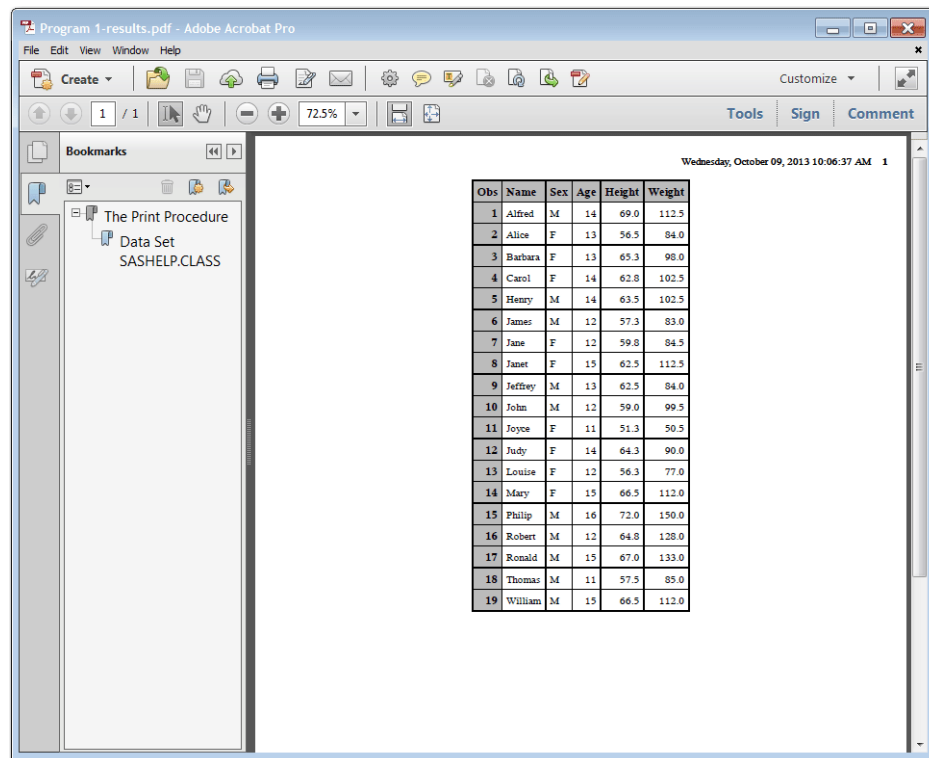
Obs	Name	Sex	Age	Height	Weight
1	Alfred	M	14	69.0	112.5
2	Alice	F	13	56.5	84.0
3	Barbara	F	13	65.3	98.0
4	Carol	F	14	62.8	102.5
5	Henry	M	14	63.5	102.5
6	James	M	12	57.3	83.0
7	Jane	F	12	59.8	84.5
8	Janet	F	15	62.5	112.5
9	Jeffrey	M	13	62.5	84.0
10	John	M	12	59.0	99.5
11	Joyce	F	11	51.3	50.5
12	Judy	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.



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.

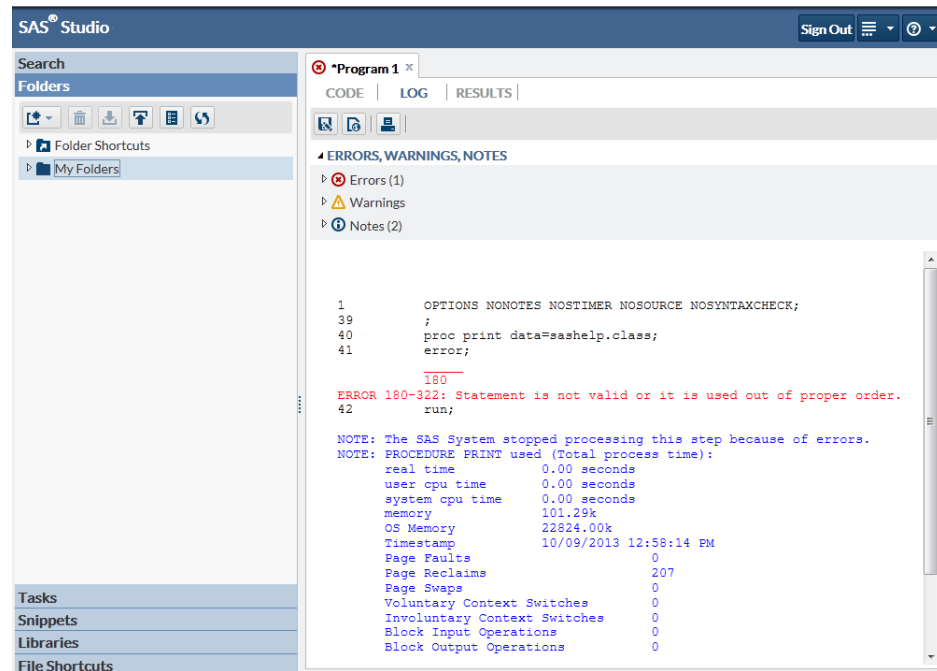
Click the **Code** tab to open your program. Add a new line after the first line of the program and enter this text:

```
error;
```

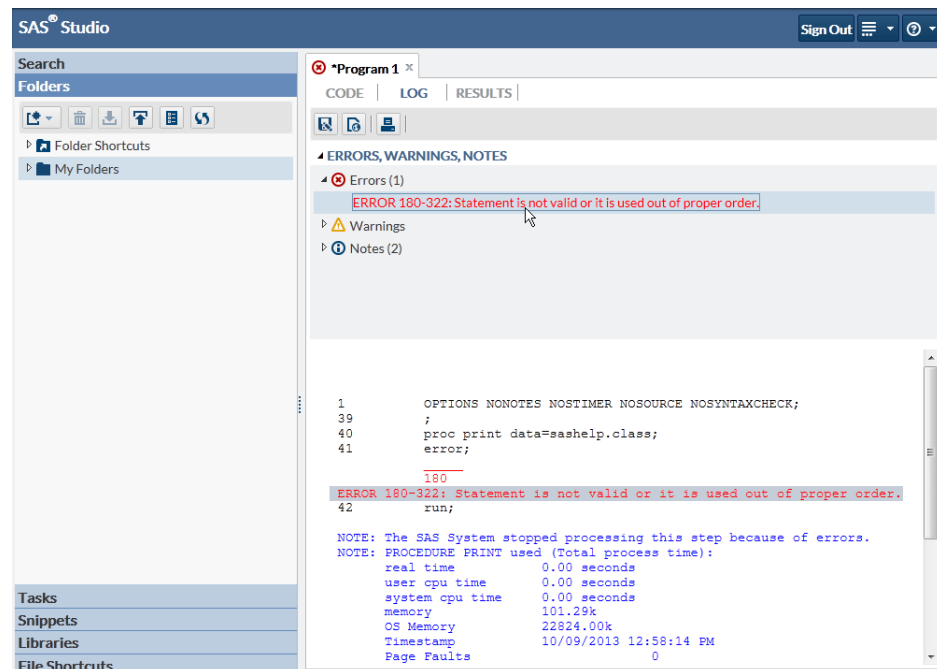
Your program should look like this:

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


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

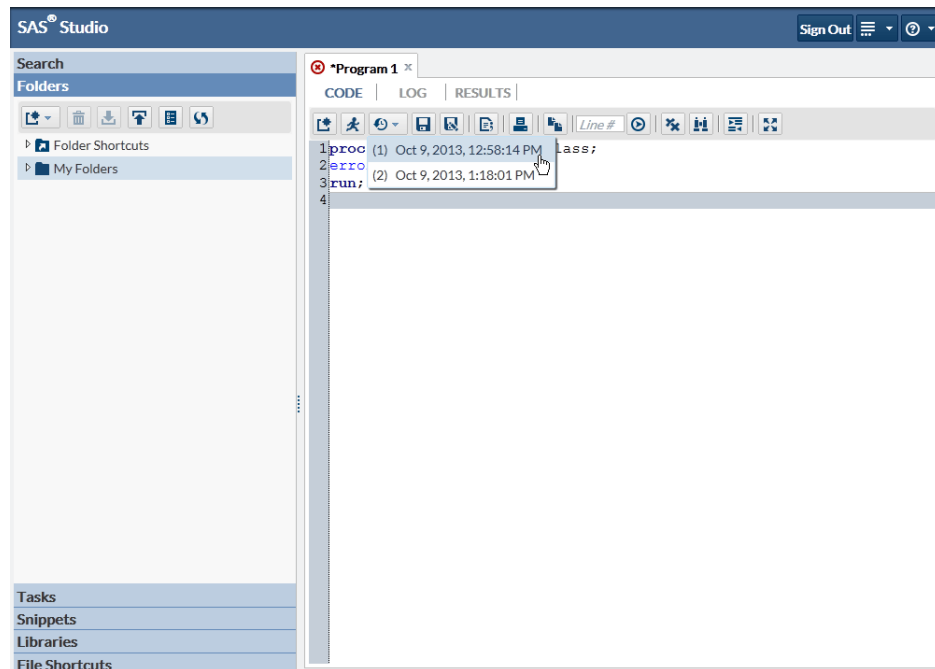


In the Errors, Warnings, Notes section, expand **Errors** to view a description of the error. Click the error message, and SAS Studio highlights it for you in the log so that you can see exactly where the error occurred.



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

Add Column Names to Your Program	11
---	-----------

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;
```

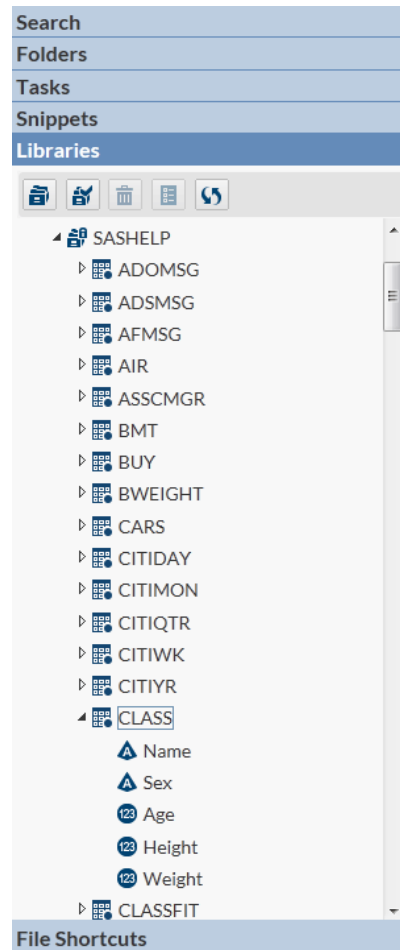
Next, add the VAR statement to the program to specify which variables, or columns, to include in the results. After the first line of code, add the following new line of code:

```
var
```

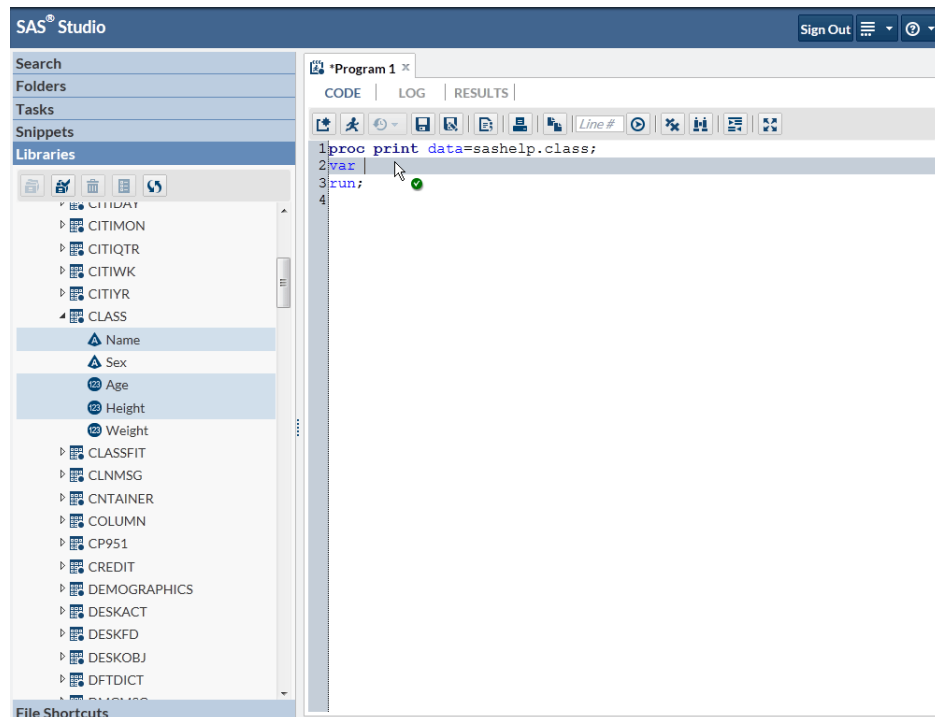
Your program should look like this:

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

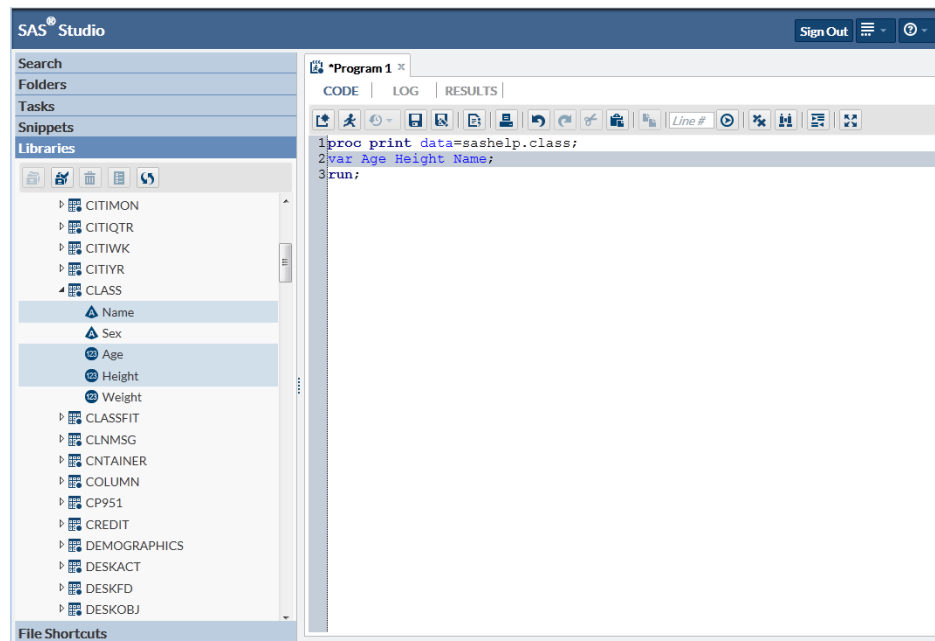
Now you can use the Libraries section to help complete the VAR statement. Click the **Libraries** section in the navigation pane and expand the Sashelp library. Locate the Class table and expand it to view the columns.



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

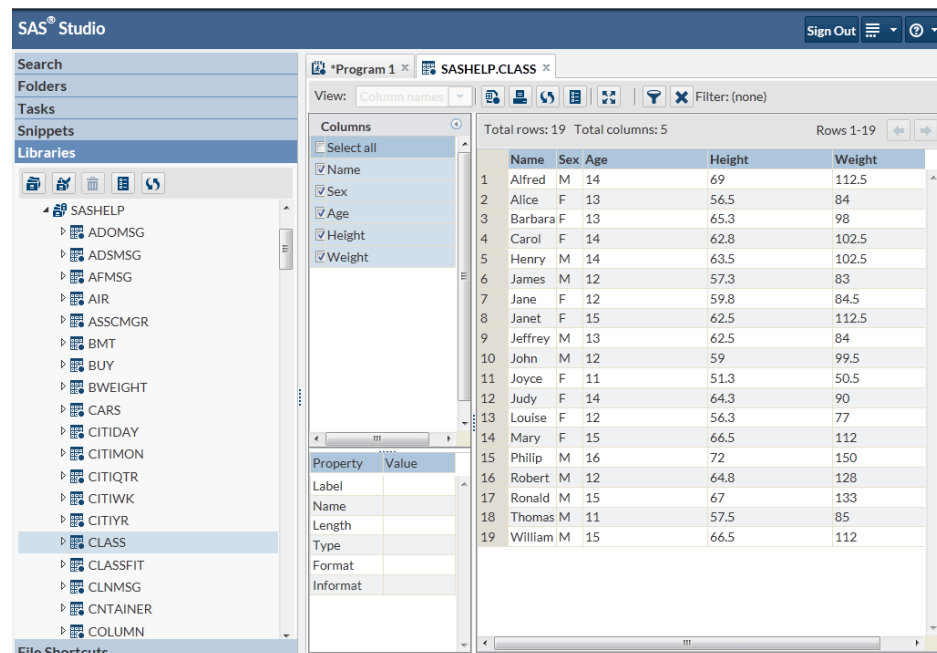
Use SAS Studio to Generate Your Code

Let SAS Studio Do the Programming for You! 15

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.



The screenshot shows the SAS Studio interface. On the left is the Libraries pane with the SASHELP library expanded, showing various tables. The 'CLASS' table is selected. The main window shows the table viewer for 'SASHELP.CLASS'. The 'Columns' pane on the left lists all columns: Name, Sex, Age, Height, and Weight, all of which are checked. The table viewer on the right displays 19 rows of data with the following columns: Name, Sex, Age, Height, and Weight.

	Name	Sex	Age	Height	Weight
1	Alfred	M	14	69	112.5
2	Alice	F	13	56.5	84
3	Barbara	F	13	65.3	98
4	Carol	F	14	62.8	102.5
5	Henry	M	14	63.5	102.5
6	James	M	12	57.3	83
7	Jane	F	12	59.8	84.5
8	Janet	F	15	62.5	112.5
9	Jeffrey	M	13	62.5	84
10	John	M	12	59	99.5
11	Joyce	F	11	51.3	50.5
12	Judy	F	14	64.3	90
13	Louise	F	12	56.3	77
14	Mary	F	15	66.5	112
15	Philip	M	16	72	150
16	Robert	M	12	64.8	128
17	Ronald	M	15	67	133
18	Thomas	M	11	57.5	85
19	William	M	15	66.5	112

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.



The screenshot shows the SAS Studio interface. On the left, the 'Libraries' pane shows the 'SASHELP' library expanded, with 'CLASS' selected. The 'Columns' pane shows 'Name', 'Sex', 'Age', and 'Height' checked. The main table viewer displays 19 rows of data. The 'Age' column is highlighted, and the 'Add Filter' dialog is open, showing a list of values from 11 to 14, with 11, 12, and 13 selected.

	Name	Sex	Age	Height
1	Alfred	M	14	69
2	Alice	F	13	56.5
3	Barbara	F	13	65.3
4	Carol	F	14	62.8
5	Henry	M	14	63.5
6	James	M	12	57.3
7	Jane	F	12	59.8
8	Janet	F	15	62.5
9	Jeffrey	M	13	62.5
10	John	M	12	59
11	Joyce	F	11	51.3
12	Judy	F	14	64.3
13	Louise	F	12	56.3
14	Mary	F	15	66.5
15	Philip	M	16	72
16	Robert	M	12	64.8
17	Ronald	M	15	67
18	Thomas	M	11	57.5
19	William	M	15	66.5

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**.

The 'Add Filter' dialog box is shown. It has a title bar 'Add Filter' and a close button. Below the title bar, it says 'Select one or more values.' A list box contains the values 11, 12, 13, and 14. The values 11, 12, and 13 are selected. At the bottom, there are three buttons: 'Filter', 'Clear', and 'Cancel'.

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.


The screenshot shows the SAS Studio interface with the SASHELP.CLASS dataset loaded. The 'Columns' pane on the left shows that Name, Sex, Age, and Height are selected. The main table view displays 10 rows of data, sorted by Height in ascending order. The 'Filter' bar at the top indicates 'Filter: Age=11 OR Age=12 OR Age=13'.

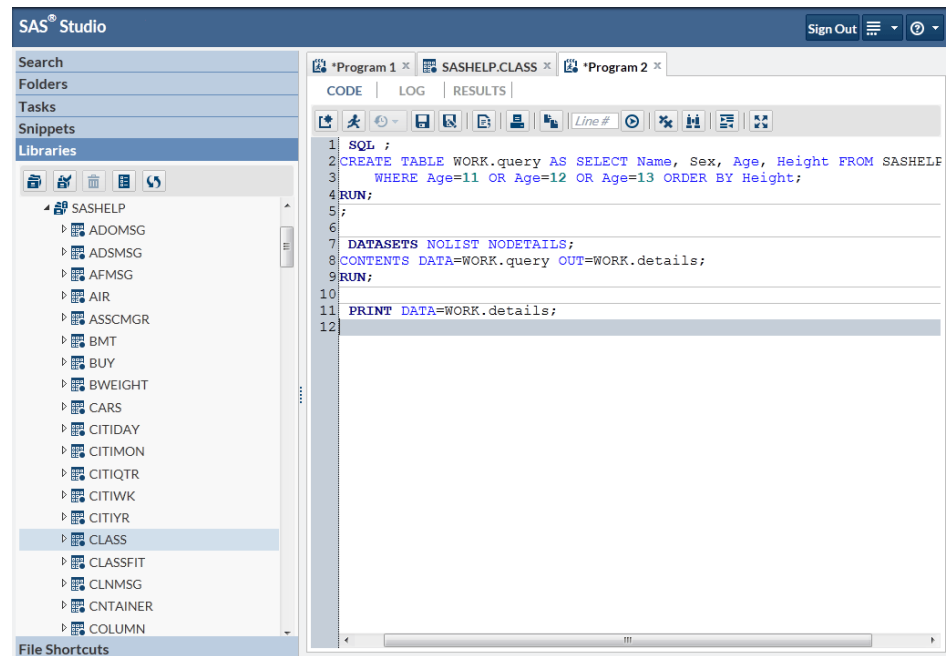
	Name	Sex	Age	Height
1	Alice	F	13	56.5
2	Barbara	F	13	65.3
3	James	M	12	57.3
4	Jane	F	12	59.8
5	Jeffrey	M	13	62.5
6	John	M	12	59
7	Joyce	F	11	51.3
8	Louise	F	12	56.3
9	Robert	M	12	64.8
10	Thomas	M	11	57.5

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.

This screenshot is identical to the one above, showing the SASHELP.CLASS dataset sorted by Height in ascending order. The 'Columns' pane shows Name, Sex, Age, and Height selected. The main table view displays 10 rows of data, sorted by Height in ascending order. The 'Filter' bar at the top indicates 'Filter: Age=11 OR Age=12 OR Age=13'.

	Name	Sex	Age	Height
1	Joyce	F	11	51.3
2	Louise	F	12	56.3
3	Alice	F	13	56.5
4	James	M	12	57.3
5	Thomas	M	11	57.5
6	John	M	12	59
7	Jane	F	12	59.8
8	Jeffrey	M	13	62.5
9	Robert	M	12	64.8
10	Barbara	F	13	65.3

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.

Chapter 5

Additional Information

For More Information 19

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 at <http://support.sas.com/documentation/onlinedoc/sasstudio/index.html>.

