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About This Book

What Does This Book Cover?
This book has two goals: the first is to show readers how to use a free version of SAS called SAS OnDemand for Academics, including how to use point-and-click menus to view, summarize, and analyze data using built-in SAS Studio tasks. The second goal is to teach readers how to program using SAS.

The first part of the book shows readers how to register for SAS OnDemand for Academics. The remaining chapters in this section explore how to use the SAS Studio tasks to inspect, summarize, display, and, finally, how to create graphical representations of data.

The second part of the book is an introduction to SAS programming. Starting from basic concepts, this part of the book discusses conditional logic, looping, SAS functions, and some slightly more advanced topics such as how to analyze longitudinal data and transform SAS data sets.

Although this book covers basic and intermediate topics, more advanced topics such as SAS date interval functions and Perl regular expressions are not covered.

Is This Book for You?
This book is appropriate for beginners as well as intermediate programmers. Even people with advanced SAS programming skills might find this book useful to learn how to use SAS Studio tasks in a cloud-based environment.

What Are the Prerequisites for This Book?
There are essentially no prerequisites for people thinking about buying this book.

What’s New in This Edition?
Parts of this book are similar to an earlier book called An Introduction to SAS® University Edition. However, because that book used SAS University Edition while this book uses SAS OnDemand for Academics, it should rightfully be considered a new book and not a second edition of the older book.
What Should You Know about the Examples?

This book includes tutorials for you to follow to gain hands-on experience with SAS. All the programs and data sets used in the text, as well as data used for the end-of-chapter problems, are included in a free download from the SAS author site. Every topic in the programming section is introduced by one or more examples.

Software Used to Develop the Book's Content

Every program in the book was written and run using SAS OnDemand for Academics, the SAS cloud-based platform.

Example Code and Data

You can access the example code and data for this book by linking to its author page at https://support.sas.com/cody.

SAS OnDemand for Academics

🎉 This book is compatible with SAS OnDemand for Academics. If you are using SAS OnDemand for Academics, then begin here: https://www.sas.com/en_us/software/on-demand-for-academics.html.

Where Are the Exercise Solutions?

Solutions to the odd-numbered problems are included at the end of the book as well and in the free download from the author site. Self-learners or instructors can request the solutions to the even-numbered problems by contacting SAS Press.

We Want to Hear from You

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Chapter 1: Introduction to SAS OnDemand for Academics

Introduction: An Overview of SAS OnDemand for Academics

SAS is many things: A data analysis tool, a programming language, a statistical package, a tool for business intelligence, and more. Until recently, you could only get access to SAS by paying a license fee (this could be an individual license, or a license purchased by a company for as many users as necessary).

The really big news is that anyone can now obtain SAS for FREE! It’s called SAS OnDemand for Academics—but don’t be fooled by the name. **Anyone can use this free version of SAS, not just students enrolled in a class.**

Some of you might know about a SAS product called the SAS University Edition. This was another free version of SAS, but you had to download software to create a virtual computer on your real computer, then download the SAS software, and finally, set up a way to read and write files from your “real” computer to the “virtual computer.” This caused many people massive headaches (including this author). The great news about SAS OnDemand for Academics (henceforth called ODA – OnDemand for Academics) is that **you don’t have to download anything!** You access SAS on a cloud platform. Also, reading data from your real computer is quite simple.

And now for the caveats: This product was developed so that people can use it to learn how to program and run tasks using SAS. It is not supposed to be used for commercial purposes. One final note: there is a 5-gigabyte limit for data files, but that is certainly not a problem for learning how to use SAS.

On many college campuses, students taking statistics courses, or any course that needs a powerful analytic tool could access a computer language called R, for free. Since free is better than not free, these institutions sometimes choose to use R instead of SAS. That is fine, except that when these students graduate, they find that in the corporate world, SAS is by far the major package for powerful statistical analysis, data manipulation, and reporting. By offering a free version of SAS, users now have a choice between SAS or R and SAS Institute is hoping that the majority of users will choose SAS.
ODA uses SAS Studio as the interface. SAS Studio provides an environment that includes a point- and-click facility for performing many common tasks, such as producing reports, graphs, data summaries, and statistical tests. For those who either enjoy programming or have more complicated tasks, SAS Studio also enables you to write and run your own programs.

Registering for ODA

To gain access to ODA, you need to register with SAS Institute. Part of the registration process is to create a SAS profile. If you already have a SAS profile, skip that portion of the instructions.

To start, point your browser to:

https://welcome.oda.sas.com

This brings up the screen shown here.

Figure 1.1: Registration Screen for ODA

If you do not have a SAS Profile, click “Don’t have a SAS Profile.” You will see the screen shown in Figure 1.2.
Figure 1.2: First Time Visitor

Before you can register you will need to create a SAS Profile account. After you create your profile and receive e-mail validation, return to this page to register for SAS OnDemand for Academics.

Click Create Profile.

Figure 1.3: Enter Your Personal Information

By the way, if you are self-employed or “retired” as I am, just enter self-employed or retired, or whatever describes your situation.
Finally, click “Agree with terms” and click the box Create Profile.

**Figure 1.4: Agree with Terms and Continue**

After clicking "Create profile," you will receive a verification email with instructions for setting your password and activating your profile.

**Figure 1.5: Verifying Your Email Address**

Thank you for creating a SAS Profile. You're almost done!

A verification email has been sent to the address you provided. To verify your email address and activate your profile, click the link in the email (subject: Please activate your SAS Profile). You will then be prompted to set a password.

It may take a few minutes for the email to reach your inbox. If you do not receive the email, check your junk email folder.

To ensure that emails from SAS are not blocked by your mailserver, add sas.com to your list of safe sender domains.

If you have trouble creating your SAS profile, send email to SASProfileHelp@sas.com.
When your email arrives (this might take some time, perhaps a day), click “Activate your profile.”

**Figure 1.6: Activate Your Profile**

![Email activation](image)

Dear ODA User,

Thank you for creating a SAS Profile. Please verify your email address and activate your profile by clicking on the following link:

**Activate your SAS Profile.**

Once you’ve activated your profile, you can access free training, SAS communities, technical support and more. If you have any questions or have not requested a SAS Profile, please email SASProfileHelp@sas.com.

Choose your password and confirm.

**Figure 1.7: Choose Your Password and Confirm**

![Password input](image)
Note that your password must contain at least 8 characters and include at least 1 lowercase letter, 1 uppercase letter, 1 symbol, and 1 number.

**Figure 1.8: Continuing the Password Selection**

![Password Selection Screen]

**Figure 1.9: A Verification Email Will be Sent**

![Verification Email Screen]
You are now ready to sign in to OnDemand for Academics (ODA).

**Figure 1.10: Signing into OnDemand**

Be sure to accept terms and then click “Sign In.” You will be asked to select a region.

**Figure 1.11: Select a Region**
You are done. Once you have received an email saying that your account is ready to use, you can select SAS Studio.

**Figure 1.12: Start SAS Studio**

Click SAS Studio.

**Conclusion**

Registering for OnDemand for Academics is really quick and easy. Just follow all the prompts and it should only take a few minutes of your time (you will need to wait for your profile to be accepted).
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