

## Paper 147-30

**Where to Go From Here: Learning More about SAS® Software**

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*Knowledge is of two kinds: we know a subject ourselves, or we know where we can find information upon it.*  
—Samuel Johnson

**Abstract**

The vast amount of information on the SAS System, particularly that available through the web, can be overwhelming.

Knowing where to find the information you need saves time and frustration. This paper is about the variety of information and media available and describes where to learn more about SAS.

**Introduction**

*Not having the information you need when you need it leaves you wanting. Not knowing where to look for that information leaves you powerless. In a society where information is king, none of us can afford that.*  
—Lois Horowitz

Information about SAS comes from many sources and is contributed by many people, including SAS professional writers, SAS developers, conference presenters, those with their own web sites, and people asking and replying to questions on SAS-L, the electronic discussion group.

Throughout this paper, we refer to papers from conferences and information located at the SAS Institute's web site. See the section "Users Groups" on how to access conference papers and the sections "SAS Customer Support Center" and "Resources on the Web" on how to access and browse SAS and other web sites.

Using RESOURCES as an acronym, we have divided this paper into these nine sections:

- R** – Regular Books
- E** – Education
- S** – SAS Customer Support Center
- O** – OnlineDoc and SAS Help
- U** – Users Groups
- R** – Resources on the Web
- C** – Comp.sys-soft.sas (SAS-L)
- E** – Experience
- S** – Sample Code

Wherever web sites are referenced in the paper, you will be able to click on the underlined name to link to the site.

*(The screen shots listed in this paper are the way the web site looked when this paper was written. Remember that the look and feel of the site may have changed. Do a search if a site referred to in this or other papers is no longer available.)*

**Regular Books**

*The man who does not read good books has no advantage over the man who cannot read them.* —Mark Twain

Let's begin with regular books, that is, printed material.

"What was the last computer book you purchased? Why? What is your favorite all time computer book? Why?" These questions appear as potential interview questions in the SUGI 25 paper "The Ultimate Match Merge: Hiring the Best SAS Programmers". Answers to these questions could indicate to the interviewer whether or not you are willing to invest in learning more and keeping up with your profession.

Books may seem expensive compared to getting information from the web for free. However, consider the time saved by referencing the needed information concisely and thoroughly presented in a book versus spending literally hours searching the web for information. In particular, you will save yourself time and frustration when you find and use those

books that teach you how to use a specific tool, such as macros or Output Delivery System. The books often have useful examples with explanations.

**SAS Titles.** SAS Publishing produces books written by SAS staff. In 1976 there was one SAS manual, *A User's Guide to SAS 76*. It consisted of 330 pages and documented the 33 procedures in SAS 76. In 1996, there were more than 340 manuals and more than 100,000 pages. A quick calculation indicates that both the number of manuals and total pages doubled about every 2½ years.

Fortunately, many of the SAS titles are available for free as part of SAS OnlineDoc. Both an HTML-based online library and a PDF version of the online library are accessible at [support.sas.com/documentation/onlinedoc/](http://support.sas.com/documentation/onlinedoc/). See the “OnlineDoc and SAS Help” section of this paper for information about SAS OnlineDoc. Many getting-started type books and example type books are not included in SAS OnlineDoc.

SAS Publishing has produced an excellent book for beginning and intermediate programmers called *Step-by-Step Programming with Base SAS® Software*. It is a how-to guide on using DATA step programming and base SAS procedures with many examples and explanations. This book can be purchased as a regular book. Also SAS OnlineDoc 9 contains the title *Step-by-Step Programming with Base SAS® Software*.

To order books online and track your order, visit the *SAS Publishing* page at the SAS Customer Support Center site ([support.sas.com/publishing](http://support.sas.com/publishing).) Click on *SAS Publishing* in the right sidebar. Here you will find the bookstore. You can search for topics and get the book's description, price and other items, such as the book's table of content, a sample chapter and SAS code used in the book. You can read book reviews and browse information about the authors.

**Books By Users.** BBU books are written by SAS users, and published by SAS Publishing. There are more than 75 BBU books. They cover a variety of topics, including SAS applications and examples. BBU books run the gamut from beginning books to those on specific topics, such as using SAS with health care. The book *Little SAS Book: A Primer*, which is shipped with installation material, is a BBU book. A BBU book can be a time-saver. For example, the BBU book, *Your Guide to Survey Research Using the SAS System* gives code and information about analyzing the results of a survey and producing graphs.

If you like to learn by example, many of the BBU books are written in that format, such as *Proc Tabulate By Example* or *Cody's Data Cleaning Techniques Using SAS Software*.

**SAS.COM.** Subscribe to the Institute's free quarterly print magazine or read it online. To subscribe, you must logon to your SAS Profile. To register, click on MY PROFILE in the upper right corner of the SAS Home page ([www.sas.com](http://www.sas.com).) There you can manage your subscriptions and also view white papers on specific technologies.

**Other Computer Books.** The SUGI 27 paper “10 Things Experienced SAS® Programmers Don't Know – But Should” lists the results of an informal survey regarding the most important skills needed by experienced SAS programmers. Knowledge of system development life cycle processes was mentioned as important with a reference to the outstanding book *Code Complete: A Practical Handbook of Software Construction* by Steve McConnell, Microsoft Press (1993.)

Also consider general computer books and books specific to your industry. Browse your local bookstore, your local college library, your company library, and online for useful computer books. The online bookstores usually have reviews of the books by readers. [Amazon.com](http://Amazon.com) sells SAS books by other publishers and some books published by SAS Institute.

**Which Books Will Be Useful To You?** One way to decide which books will be useful to you is to browse the books in the publications area of the Demo Area at the regional and SAS international conferences. Another way is to visit the bookstore of SAS Publishing.

## Education

*A man will be imprisoned in a room with a door that's unlocked and opens inwards; as long as it does not occur to him to pull rather than push. — Ludwig Wittgenstein*

SAS Training, available in many formats and delivery methods, is available from SAS Institute and other sources. Visit *Training* at the SAS Customer Support Center site ([support.sas.com/training](http://support.sas.com/training)) for the most current information about training and courses offered by the Institute. You may also want to subscribe to EDUation, a monthly electronic newsletter that is free and contains news about the latest on training, certification and special offers for subscribers. Go to [support.sas.com/training/news](http://support.sas.com/training/news) for instructions on subscribing.

Here are some of the training delivery methods offered by SAS Institute.

**Instructor-based courses.** SAS Institute instructor-based courses are offered in many cities and before and after the SUGI conference. The Course Notes that you receive in the course are also sold at SAS Publishing on the SAS site.

**e-Learning.** SAS e-Learning allows you to take SAS Institute professional training from your desktop. SAS Institute offers two forms of e-Learning, self-paced courses and live web classes. Self-paced e-Learning courses are affordable and there are even some free courses such as *Getting Started with SAS* and *Getting Started with SAS Enterprise Guide*. Self-paced e-Learning courses are taken in conjunction with the SAS software and include interactive questions and quizzes and guided exercises so that you can practice as you learn. There are self-paced e-Learning for individuals and for organizations. Live web classes are taken using a web browser and telephone from your desktop. In real time, you can interact with the SAS instructor and fellow students.

**SAS Learning Edition.** The SAS Learning Edition is a package that provides a hands-on experience way to learn SAS, particularly for students at educational institutions. It includes educational software (valid through December 2008), an Enterprise Guide tutorial, online help, and a turnkey customized installation. Go to the *Bookstore* section of *SAS Publishing* and search for “Learning Edition” for information about this package and its cost.

**SAS Certification Professional Program.** SAS Institute has a global certification program. One way to prepare for the certification exams is the SAS Certification: Base Programmer and Advanced Programmer e-Learning courses that can be licensed from the Institute. For information, visit [support.sas.com/certification](http://support.sas.com/certification). Click on *Training & Preparation* in the right sidebar.

**Getting Started with SAS Software.** The drop-down menu of SAS System Help points to the “Getting Started” tutorial, which has hands-on experience using SAS software. This same tutorial is available at the SAS site. Select *Training*→*E-learning* and then click on *Free Tutorials* on the right side of the page.

**UCLA Learning Module.** Check out the SAS Learning Modules from UCLA Academic Technology Services at [www.ats.ucla.edu/stat/sas/modules/default.htm](http://www.ats.ucla.edu/stat/sas/modules/default.htm).

**SAS Users Groups.** Hands-on workshops and pre/post conference training are offered at the regional conferences and at the SUGI conference. Sunday Seminars and Wednesday Afternoon Seminar on a variety of topics are offered for a fee before and after the SUGI conference. Local users groups usually offer training at their meetings.

**Other Vendors Training.** Other vendors offer training on SAS. You may see them advertising in users group newsletters, offering training at regional conferences, and staffing booths in the conference demo area.

**Efficient Ways to Learn SAS.** The SESUG paper “Efficient Way to Learn SAS® with Virtually No Cost” provides a list of web resources for learning SAS and is at [www.rtpnet.org/~rtsug/Finalpaper.doc](http://www.rtpnet.org/~rtsug/Finalpaper.doc). Just click on the link in the paper to go directly to the site listed or cut and paste the link to your web browser.

## SAS Customer Support Center

**SAS Institute’s Web Site.** SAS Institute’s site is both for those who are interested in learning about the SAS products and for those who are already using SAS software. The home page is located at [www.sas.com](http://www.sas.com).

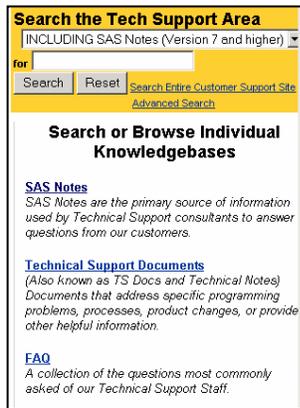
As a user of SAS software, you will want to visit the SAS Support Center. Either go to [support.sas.com](http://support.sas.com) or choose *Support and Training* or *SAS User* at [www.sas.com](http://www.sas.com). Next, you will see the following screen. You will want to become familiar with what is available by visiting the topics listed in the bar on the left of the screen.

For more information, see the SUGI 27 paper “Tips, Downloads, Samples, and Training – Discover the Service and Support Web Site”.

**Technical Support.** One of your primary areas of interest will be the pages listed by clicking *Technical Support*. The first place to visit there is *Top Ten Ways to Use Our Web Site*. *How to contact Technical Support* explains that you can do an

online problem or question submission or contact them by phone. You will be asked for your site or customer number, which is displayed in the log when you first start the SAS System.

Become familiar with searching for information in the individual knowledgebases.



The SAS knowledge databases, known as [SAS Notes](#), contain information on known problems, fixes, documentation errors and corrections, usage issues and tips.

[Technical Support Documents](#) provide helpful information. You will find some gems here. For example, TS-664 *A DATA Stepper's Introduction to ODS* gives examples of using ODS in the DATA step. TS-722, entitled *Marketing Research Methods* is a recent addition and consists of 857 pages. TS-722I is the *Experimental Design and Choice Modeling Macros* used in the document.

Browse the index by number or category and review the titles of all the documents. Once you get to the index page, there is a dialog box so that you can search all technical documents.



**Documentation.** SAS Publishing is located under the topic *Documentation*. Here you can subscribe to SAS Institute's e-newsletters *Your SAS Business Report* and *Your SAS Technology Report*, which are delivered on alternating Tuesdays. You can quickly read the few entries in the e-mail and select the links to articles of interest on the SAS web site.

On the Documentation page, you will find a link to [White Papers](#). The IT industry uses the term “white paper” to describe articles that explain and promote the benefits of particular technologies and products. SAS Institute has white papers on a variety of topics. For example, if you are interested in learning about the capabilities of SAS Enterprise Guide, there is a white paper entitled “SAS Enterprise Guide® — A Roadmap”. In order to access the white papers, you must first log in. If you do not already have a profile, there is a link to the form to create one.

**Communities** Be sure to explore the *Communities*. It is a collection of information about a common area, such as *Base SAS* or *Web Technologies*. Here's where you will find information on new and experimental products and solutions. If you are interested in ODS, the Output Delivery System, then go to [ODS Resources](#) in the Base SAS Community.

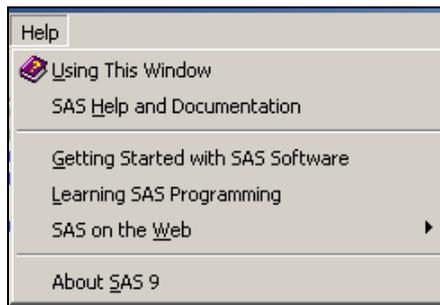
## OnlineDoc and SAS Help

"Joy in looking and comprehending is nature's most beautiful gift." — Albert Einstein

The SAS OnlineDoc is an online reference library that contains more than 70 titles and thousands of pages of reference documentation. The documentation would cost more than two thousand dollars if purchased as individual printed books. You can access the SAS OnlineDoc from within a SAS session or from the SAS web site for free.

SAS 9 combines online documentation and help into one resource called SAS Help and Documentation. It contains a complete description of each SAS procedure, along with examples. It contains complete descriptions and examples of the components of the SAS language, such as, functions, formats, and the macro facility. It includes what's new in the latest releases; information on your operating environment and the windowing environment; numerous sample programs; and more. Only the documentation for the software licensed by your site is installed; thus making it easier to find the information you need.

*SAS Help and Documentation* is accessed from within a SAS session by selecting the Help drop-down menu.



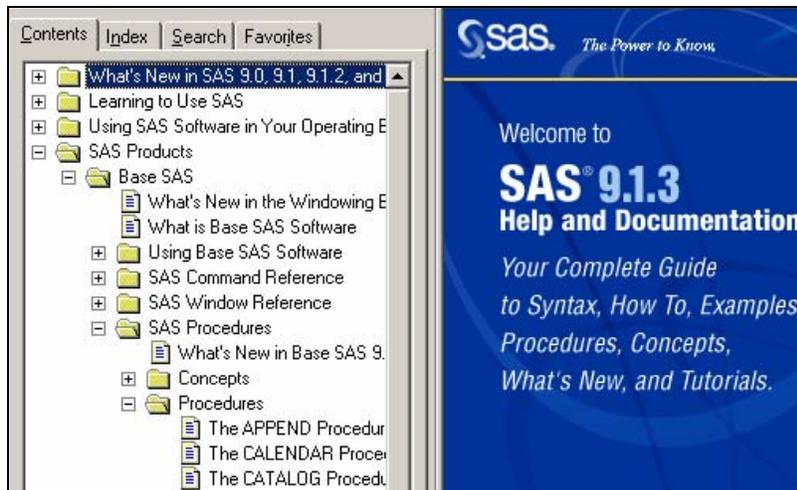
The Help drop-down menu in SAS 9 also includes: *Using This Window* (information about the currently selected window), *Getting Started with SAS Software* (quick-start tutorial for new SAS programmer and resource tutorial for experienced SAS programmer), *Learning SAS Programming* (if you license SAS online training), *SAS on the web* (link to [www.sas.com](http://www.sas.com)), and *About SAS 9* (information about the SAS 9 release on your system.)

**Contents Tab.** After opening *SAS Help and Documentation*, click on the Contents tab to see the table of contents. When you get a new release of SAS, browse the *What's New* section for new features and enhancements.



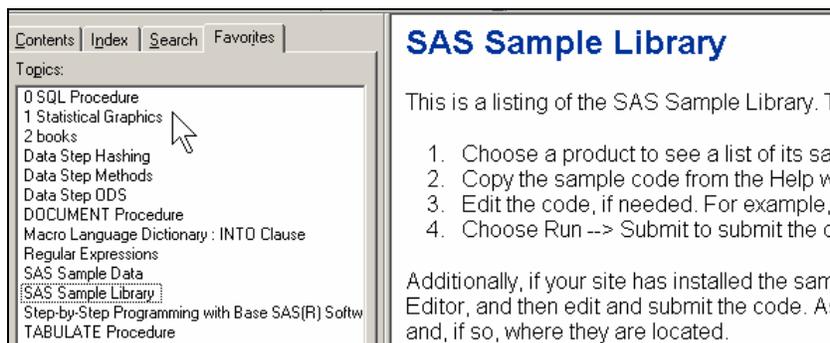
Select the +/- sign next to each section to expand/collapse the table of contents. Expand any of the sections of interest to become familiar with *SAS Help and Documentation*. By becoming familiar with the layout, it will be easier to find the information when you are in a hurry.

Here we have expanded some sections to show the location of the documentation for the Base procedures.

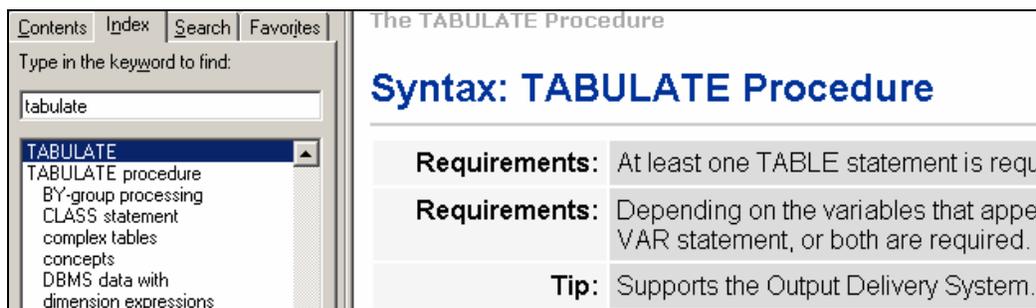


**Favorites Tab.** If you are on a help page to which you may want to return, then click on the Favorites tab, and click the add button at the bottom of the panel. The name listed may not be clear or concise. In that case, right mouse click on the name and rename it. When you open Help again, you will find the favorite topics listed in alphabetical order by the new names. Therefore, topics that you reference often could be named so that they appear at the top of the listing.

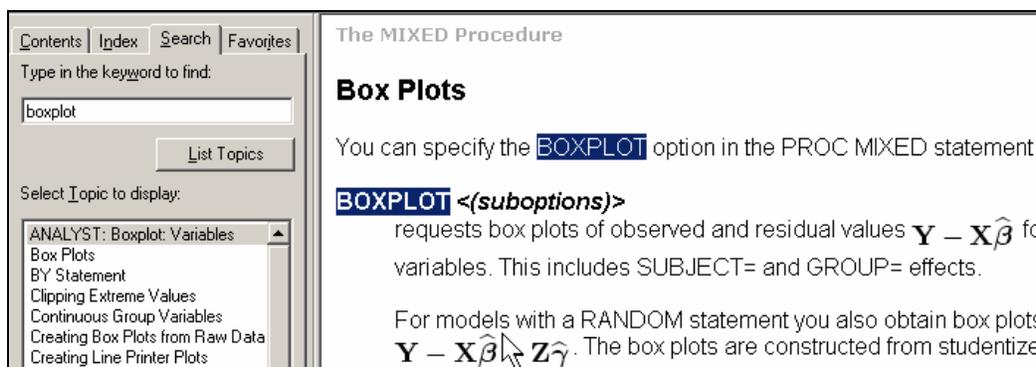
To easily return to a favorite page, click on the Help Favorites tab and double click on the topic in the list of favorites that you have added. Be generous in adding favorite topics. It is quick and easy to do. Besides, you can always remove topics that you no longer want.



**Index tab.** The comprehensive master index is located under the Index tab. If you want to display an index for a specific keyword, type the keyword in the field. Being able to search the index for a specific keyword saves time.



**Search Tab.** Select the Search tab to perform text searching for a specified keyword. Enter the keyword in the find field and click the *List Topics* button. Double-click one of the topics found or highlight a topic and click on the *Display* button at the bottom. The keyword will be highlighted in the documentation displayed.



**Context-sensitive Help.** Another way to quickly get to the help documentation from the program editor window is to use the context-sensitive help feature. Context-sensitive help is activated by pressing the *Help key*, usually F1, and it displays the help documentation for the subject where your present cursor position is located. Here's an example of how to use it. Put your cursor on a PROC name in the program editor and press F1 to go directly to the help for that procedure. For example, you are in the editor window and have typed PROC TABULATE and cannot remember the syntax. Put your cursor on TABULATE and press the F1 (help) key. Up pops the help window for that procedure.

**Help Command.** On the command line, you can type the word *help* followed by a topic.

**Using This Window.** One of the menu items in the Help drop down menu is *Using This Window*. Click on this item to find out information about your currently active window. This is helpful for finding out features about commonly used windows and learning how to use a new window, such as the Query window or Graph-N-Go window.

**SAS OnlineDoc at the SAS Web site.** HTML-based SAS OnlineDocs for version 8 and higher are available under *Documentation* at the SAS site ([support.sas.com/documentation/](http://support.sas.com/documentation/).) You can reach the printer-friendly PDF version of the SAS reference library 9.1 online from this location. Use the PDF version to print selected pages or entire books. You can also read and download from the PDF version.

**SAS OnlineDoc 9.1 for the Web CD-ROM.** This can be installed on a web server in most Windows and Unix environments. The same SAS titles are accessible that are accessible from within a SAS session. The advantage is that you can access the documentation without opening your SAS session.

**SAS OnlineDoc CD-ROM for the Windows Desktop.** The SAS OnlineDoc 9 CD-ROM for the Windows desktop is available for purchase from SAS Publishing at [support.sas.com/publishing/](http://support.sas.com/publishing/).

## Users Groups

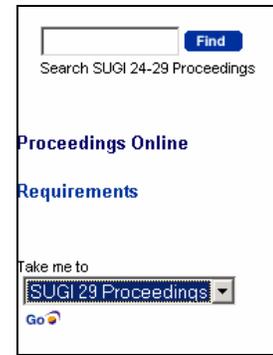
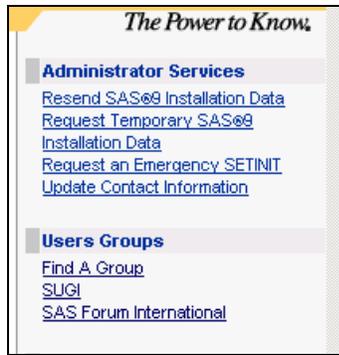
*None of us is as smart as all of us.* —Anonymous

SAS conferences offer numerous benefits, such as a place to talk with your peers, exchange ideas, attend papers on topics of interest to you and talk to SAS staff in the demo areas. They also offer hands-on workshops and pre/post conference training. Go to the topics under *Users Groups* on the right bar on the SAS Customer Support Center page to find out more about local, regional, international, and special interest users groups and conferences.

The conference *Proceedings* is a compilation of the papers and posters given at the conference. If you attend the SAS International Users Group (SUGI), you will get a CD-ROM version of the Proceedings. It usually has the current and the two previous conference *Proceedings*.

The SUGI *Proceedings*, beginning with SUGI 22, are located at the SAS web site.

To get to the *SUGI Proceedings* online, choose *SUGI* under *Users Groups* and then [Online Proceedings](#). Here you can search for a topic or go directly to a particular proceedings.



**Regional and Special Interest Groups.** NESUG (The NorthEast SAS Regional Users Group) has their proceedings from 1997 to present available online at their web site ([www.nesug.org](http://www.nesug.org).)

PharmaSUG, the Pharmaceutical Industry SAS® Users Group ([www.pharmasug.org](http://www.pharmasug.org)), has their proceedings online since PharmaSUG 2000

Lex Jansen's web site ([www.lexjansen.com](http://www.lexjansen.com)) has access to the SUGI, NESUG and PharmaSUG proceedings and organizes papers by categories. You can also access the SAS-L archives from his site.

Visit the SAS Consultant Special Interest Group ([www.sconsig.com](http://www.sconsig.com)) for SAS tips and links to other sites. Go to the directory at the bottom of the page and click on *SAS Web Ring* to see other sites with SAS information. Select *SAS Tips and Techniques* ([www.sconsig.com/sastip.htm](http://www.sconsig.com/sastip.htm)) to view over 400 coding tips and techniques. You can even be sent email when the page changes.

**Notes About the Adobe® Reader®.** You will use the free Adobe Reader from your Web browser to view and print papers from the *Proceedings*, which are stored in Adobe PDF (portable document format.) Adobe Acrobat Reader 5 and higher allows you to select and cut columns of text, which is useful for cutting sample code from SUGI papers with two columns.

Attached to each document is certain security and permission parameters, such as restrictions on printing, copying, or cutting text from a document. You can view, but not change, the security settings for a PDF file. To view the security settings of a document open in Adobe, choose *File > Document Properties* and click the *Security* tab. To view the security settings of a document open in a web browser, click on the pop-up menu  above the vertical scroll bar on the right side of the document. Choose *Document Properties* and click on the *Security* tab.

## Resources on the Web

*"By means of electricity, the world of matter has become a great nerve, vibrating thousand of miles in a breathless point of time ... The round globe is a vast brain, instinct with intelligence. — Nathaniel Hawthorne, 1851*

*With so much information now online, it is exceptionally easy to simple dive in and drown. —Alfred Glossbrenner*

In his book *Information Anxiety*, Richard Saul Wurman writes:

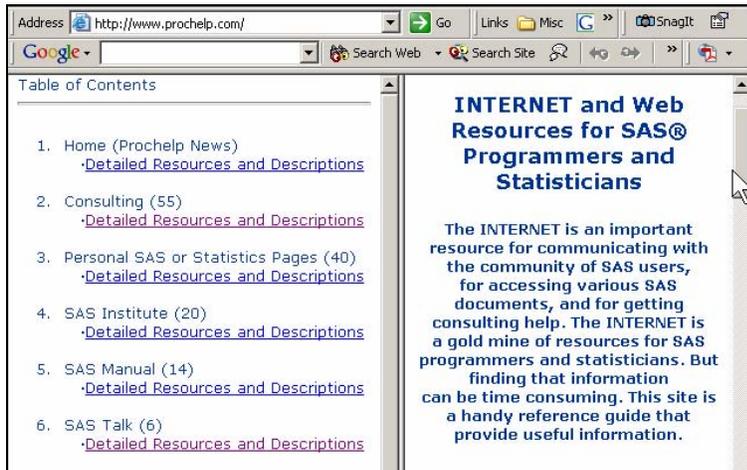
If Orwell were writing 1984 today, he would not say, "Destroy the information." He would say, "Inundate people with information, they'll think they're free. Don't deny them. Give them more. Undigested information is no information at all, but it creates the fiction that you *have accessed it, even though you didn't benefit from it.*"

On the Web, you are inundated with so much information that it is indeed overwhelming. The Internet is growing so rapidly that it is difficult to keep up with all the information and services. Therefore, it is useful to know where to look.

**Other SAS Resource Sites.** Other web sites of interest to SAS programmers are those with collections of documents about SAS, collections of SAS code, SAS tips and the various sites that demonstrate running SAS programs from the web. Some of these sites are supported by regional and special interest users groups and can be reached from the SAS site *Users Groups* pages. Follow the link to a specific users group and see if there is a link to its web site.

The SUGI 26 Paper "Internet and Web Resources for SAS Programmers and Statisticians", gives an extensive list of SAS related web sites. It is divided into categories, such as Consulting, Personal SAS or Statistics Pages, Useful Resources,

Statistics Resources, and Tutorials And Tips. An updated listing of resources is kept by Wei Cheng at [www.prochelp.com](http://www.prochelp.com). Use the table of contents listed in the frame on the right of the web page to select a category.



**UCLA site:** The UCLA site ([www.ats.ucla.edu/stat/sas/](http://www.ats.ucla.edu/stat/sas/)) lists resources of interest as shown here.



**Statistical Sites.** Besides links to web pages that perform statistical calculations, the Interactive Statistical Pages ([www.statpages.net](http://www.statpages.net)) also links to online statistics books, tutorials and related sites. The Electronic Statistics Textbook ([www.statsoft.com/textbook/stathome.html](http://www.statsoft.com/textbook/stathome.html)) is an extensive site that gives training on statistical concepts and applications

**E-newsletters.** SAS Views ([www.views-uk.demon.co.uk](http://www.views-uk.demon.co.uk)) is the newsletter of the Independent UK SAS User Group and offer tips and techniques. Ratcliffe Technical Services web site (<http://www.ratcliffe.co.uk/>) is another newsletter that offers hints and tips.

**Other Web Sites.** The best way to discover what is available on the web is to use a search engine. Well known search tools are Google ([www.google.com](http://www.google.com)), msn Search ([search.msn.com](http://search.msn.com)) and Yahoo ([www.yahoo.com](http://www.yahoo.com).)

For example, when someone sends you an e-mail or a story that you think is a hoax, check it out by searching for the relevant information or visit the Urban Legends Reference Pages ([www.snopes.com](http://www.snopes.com).)

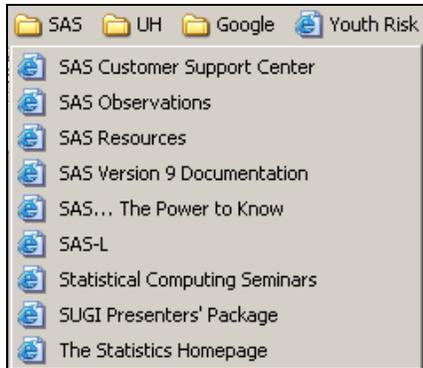
In doing a Google search on the keywords "find data Internet", we found journalist Robert Niles' page "Finding Data on the Internet" ([www.robertniles.com/data](http://www.robertniles.com/data).) It has links to a number of general interest sites for researchers and journalists and a link to his page [How to Use Math and Statistics](#). Niles' simple explanations of basic concepts in statistics might be helpful when you need to explain one of the concepts to someone else.

**Web Skills.** When searching, be careful of your time. The web has a lot to offer. At the same time, it can be a time sponge. You can spend hours reading discussion groups and doing searches. You can find an enormous amount of information of which only a small portion is useful or you can find some extremely beneficial information. Just remember to keep your goal in mind and set a mental or actual alarm clock.

Use your critical thinking skills when finding information on the web. Not all sources on the web are equally valuable or reliable. When visiting sites while researching this paper, we found resources that were out-of-date or biased.

Remember to bookmark sites of interest, so that you easily find them again. You can also drag an address to the Links toolbar on your web browser for sites that you visit frequently. See the example under the topic Comp.soft-sys.sas.

You may want to set up a folder of SAS links, such as:



Right mouse click on one of the links and choose properties to find out where the links are stored and where to create the folder.

## Comp.soft-sas.sys (SAS-L)

*The more that you read, the more things you will know. The more that you learn, the more places you'll go.*  
— Dr. Seuss

**SAS-L** is the electronic users group devoted to the discussion of SAS software and has been in existence since 1986. It is available as a newsgroup comp.soft-sas.sys and a mailing list. SAS-L is where we learned about [UltraEdit®](#), our favorite editor.

You can give and receive SAS expertise on the SAS-L discussion group. Once you start reading SAS-L messages, you will find that there are several SAS experts who consistently assist SAS users with their SAS questions.

There are thousands of people who read the SAS-L messages. Here are three ways to read the messages. You can subscribe to SAS-L and receive the messages in your mailbox. You can read the messages in the newsgroup through a newsreader client on your computer. Finally, you can read the messages through the Google Groups web page.

**Subscribing to SAS-L.** To subscribe to the SAS-L mailing list, send an e-mail message to the address [listserv@uga.cc.uga.edu](mailto:listserv@uga.cc.uga.edu). In the body of the message, type: SUBSCRIBE SAS-L your name

You may receive each message separately or you may get a daily compilation of the day's messages by sending the list server the message: SET SAS-L DIGEST.

**Newsgroup COMP.SOFT-SYS.SAS.** You may want to view the messages via the newsgroup comp.soft-sys.sas. The advantage is that you don't have mail coming directly to your mailbox. The disadvantage is that messages on the newsgroup may be a few hours old.

You can set up a newsreader client on your computer to access this newsgroup.

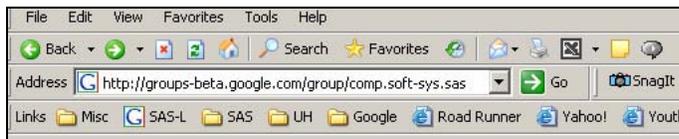
An easy way to view the newsgroup is to use Google Groups from your Web browser. Go to [www.google.com](http://www.google.com) and click on the Groups tab. It can also be found at [groups.google.com](http://groups.google.com). The SAS-L group can be found at: <http://groups-beta.google.com/group/comp.soft-sys.sas>.



Once you have the group messages listed, bookmark it or put it on the Links toolbar of your web browser. With Internet Explorer and other web browsers, you can drag the address in the Address box to the Links toolbar.



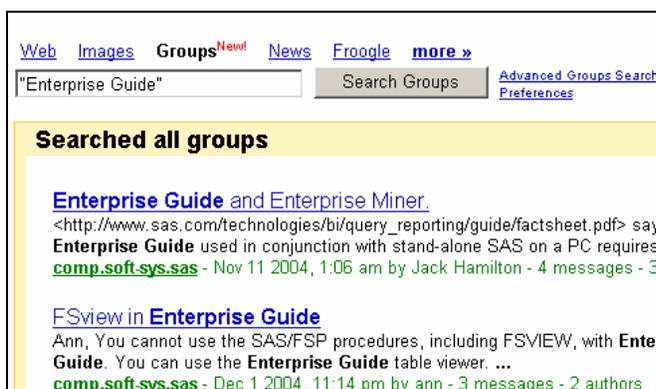
Then shorten the text of the link by right mouse clicking on the text next to the icon and renaming it "SAS-L". This way you can quickly call up the SAS-L group by clicking on your newly created link SAS-L.



**Searching the SAS-L Archives.** The SAS-L archives, a repository of previously sent messages, is a good source of information to search for answers. You can search the SAS-L archive at: [www.listserv.uga.edu/archives/sas-l.html](http://www.listserv.uga.edu/archives/sas-l.html).

Also, you can search the archives at Google. They are maintained back to the first message posted on comp.sys-soft.sas on July 20, 1993, announcing the creation of the unmoderated newsgroup "comp.soft-sys.sas The SAS statistics package."

You can search all groups or do an Advanced Groups Search and limit the group to comp.soft-sys.sas and fill in other limits, such as message date. If you are already at the group, you will see the dialog box "Search this group" on the right side of the page. There are over 175,000 messages in the newsgroup.



## Experience

*You make a living by what you get. You make a life by what you give.* —Winston Churchill

**Seek Out The SAS Expert.** You probably know who is the SAS expert at your company and who is willing to answer questions and help with problems. You can also find out who are the designated local SAS support personnel at your company. At the [SAS Customer Support Center](#), click on *Technical Support*→ *Explore Services*→ *SAS Support Personnel*.



You will be emailed the information.

**Exchange Ideas.** When you feel comfortable using SAS, consider giving back to the SAS community by providing information to others. Exchange ideas and share expertise with your colleagues and within your organization. Become involved in the SAS-L discussion group.

**Users Group Participation.** Get and share information by participating in a users group at the local, regional and/or International level. The international and regional conferences are planned and organized by SAS users, like you, who generously donate their time and talents. Volunteers are always needed and essential to the continued success of the conferences. A partial list of tasks and talents needed is section chairs, session coordinators, speakers, and judges. Regional conferences also need publication and registration coordinators, registration staff, and coordinators for the facilities, audio-visuals, special events, and pre and post-conference courses.

So, if you don't want to speak or give a poster, remember that there are many other ways to share your talents, time, and expertise at a conference.

**Your Own Experience.** Keep a log of your own SAS experience and SAS code. An online log can contain links to papers and SAS code.

## Sample Code

*The limits of my language are the limits of my mind. All I know is what I have words for.* —Ludwig Wittgenstein

Examples are an excellent way to learn about a procedure or feature. Examples of SAS code are located in many places. Usually you just need to select and copy the example into the editor window of your SAS session or your program file, check that you have any needed data and the libnames and filenames that point to data are correct for your operating system and then run the code.

**Sample Code in SAS Help.** You can access the SAS Sample Library from SAS Help in your windowing environment. After accessing Help in Version 8, click on the Contents tab and then on *Sample SAS Programs and Applications*. In Version 9, click on Help on the menu bar, then *SAS Help and Documentation*. Next click on the Contents tab, *Learning to Use SAS* and then on *Sample SAS Programs*.

The left screenshot shows the 'SAS/STAT Sample Programs' window. It has a 'Contents' pane on the left with a tree view showing folders like 'What's New in SAS 9.1', 'Learning to Use SAS', 'Sample SAS Programs', 'SAS e-Learning', 'Tutorial: Getting Started with SAS', 'Accessing Help from a CD-ROM', 'Using SAS Software in Your Organization', 'SAS Products', and 'SAS User Support Services'. The main area is titled 'SAS/STAT Sample Programs' and contains a 'Table of Contents' section. Below this, it says 'If the sample is untitled, it is listed by its original filename.' There are two procedure sections: 'ACECLUS Procedure' with links for 'Getting Started Example for PROC ACECLUS' and 'Documentation Examples for PROC ACECLUS'; and 'ANOVA Procedure' with links for 'Documentation Examples for PROC ANOVA', 'ANOVA for Latin Square Treatment Design', 'Split-Split-Split Plot ANOVA', and 'Two-Way Nonparametric ANOVA'.

The right screenshot shows the 'SAS Sample Library' window. It has a 'Contents' pane on the left with 'SAS Sample Library' and 'The TABULATE Procedure'. The main area is titled 'SAS Sample Library' and contains the text 'This is a listing of the SAS Sample Library.' followed by a numbered list: '1. Choose a product to see a list of its samples', '2. Copy the sample code from the Help window', '3. Edit the code, if needed. For example, change the data set name.', and '4. Choose Run --> Submit to submit the code.' Below this, it says 'Additionally, if your site has installed the sample programs directly in the SAS Program Editor, and then you can check whether the sample files have been installed.' There are two links: 'Host Specific Features' and 'Base SAS'.

You can select, cut and paste the example into the Editor Window.

If the Sample SAS Programs are not accessible, please ask your SAS Installation Representative for the location of your local Sample Library or look on the distribution media for the SAS software.

**Code Sample at SAS Customer Support Center.** The first place to start to find sample code is at the SAS Customer Support Center. Choose [Code Samples](#) from the menu on the left of the home page. You will see this page displayed.

The screenshot shows the 'Code Samples' page on support.sas.com. The page has a blue header with the SAS logo and 'Code Samples' text. Below the header is a navigation bar with 'Home', 'Technical Tips', and 'SAS Bits & Bytes'. The main content area is titled 'Code Samples and Technical Tips' and includes a search bar with the text 'Search samples and tips for:' and a 'Find' button. Below the search bar is a link to 'Search Entire Customer Support Site'. The main content area contains several sections: 'Technical Tips' (with a link to 'Our Quality Partners, SAS consultants, and long-time SAS software users offer tips based on their experience. Learn from others' expertise. If you have suggestions for Technical Tips you'd like to see, please send them to [techedit@sas.com](mailto:techedit@sas.com).'), 'SAS Bits and Bytes: How to Advice from the Field' (with a link to 'SAS instructor Melinda Thelbar provides a quarterly column alternating among SAS topics suitable for different levels of SAS users: beginners, intermediate and advanced.'), 'Samples from Technical Support Consultants' (with a link to 'These samples cover a wide range of SAS products and technologies and are written by consultants within SAS Technical Support. Visit the Technical Support site to search for samples that help jump start your next SAS programming project.'), 'Samples from SAS Developers' (with a link to 'Who knows SAS software better than those who create it? Visit the SAS Communities for samples written by the SAS development staff.'), 'Samples Published in SAS Documentation' (with a link to 'If you are looking for the sample code from your favorite SAS book, you can find it — organized by book title — on the SAS Online Samples page.'), and 'Technical Tips Archive' (with a link to 'Browse through your favorite technical tips from Your SAS Technology Report, sorted by publication date').

Check out the sample code from SAS Institute and BBU books under [Samples Published in SAS Documentation](#) listed on the above page.

The screenshot shows the 'Documentation' page on support.sas.com. The page has a blue header with the SAS logo and 'Documentation' text. Below the header is a navigation bar with 'Home', 'Products & Solutions', 'Install Center', 'Operating Environments', and 'FAQs'. The main content area is titled 'SAS Online Samples' and includes the text 'An [index of books with online sample code](#) is also available.' Below this is a list of books with online sample code, including: 'A Handbook of Statistical Analyses Using SAS, Second Edition (Pubcode 58679)', 'A Step-by-Step Approach to Using SAS for Factor Analysis and Structural Equation Modeling (Pubcode 55984)', 'A Step-by-Step Approach to Using the SAS System for Univariate and Multivariate Statistics (Pubcode 57496)', 'Advanced Log-Linear Models Using SAS (Pubcode 57496)', 'Annotate: Simply the Basics (Pubcode 57320)', 'Applied Multivariate Statistics with SAS Software (Pubcode 55234)', 'Applied Multivariate Statistics with SAS Software, Second Edition (Pubcode 56903)', 'Applied Statistics and the SAS Programming Language, Fourth Edition (Pubcode 55984)', 'Carpenter's Complete Guide to the SAS Macro Language (Pubcode 56100)', 'Carpenter's Complete Guide to the SAS Macro Language, Second Edition (Pubcode 59219)', 'Categorical Data Analysis Using the SAS System (Pubcode 55320)', 'Categorical Data Analysis Using the SAS System, Second Edition (Pubcode 57998)', 'Cody's Data Cleaning Techniques Using SAS Software (Pubcode 57198)', and 'Combining and Modifying SAS Data Sets: Examples (Pubcode 55219)'. Each item in the list is a link to the book's page.

**Samples from SAS Developers** Visit the SAS Communities on the SAS site for sample code in the various areas, such as ODS examples under the Base SAS Community or web-enabled data visualization samples under Data Visualization.

**Sample Library.** The Version 6.12 Samples Library consists of over 1250 files and can be accessed through [SAS Sample Programs](#) under the Technical Support area at the SAS Customer Support Center.

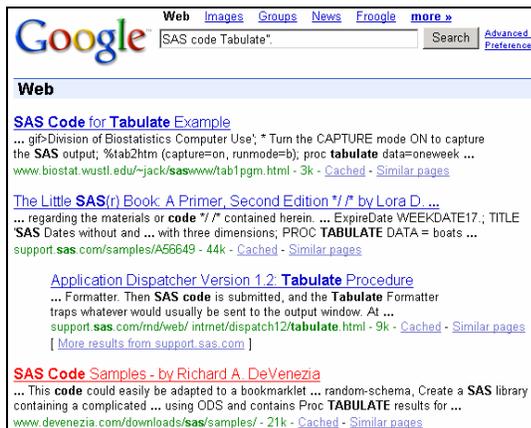
**Examples in SAS OnlineDoc.** SAS OnlineDoc has examples for most of the procedures. Usually any needed data are included with the code. You can see the Results by clicking on the Listing or HTML Results icons listed after the example. You can compare your results of running the code with the Results listed with the example.

**Examples in the Conference Proceedings.** Some conference papers include snippets of code or complete examples. Prior to SUGI 29, the papers in the conference *Proceedings* are in 2 columns. Adobe Acrobat reader 5 and higher allows you to select and cut columns of text.

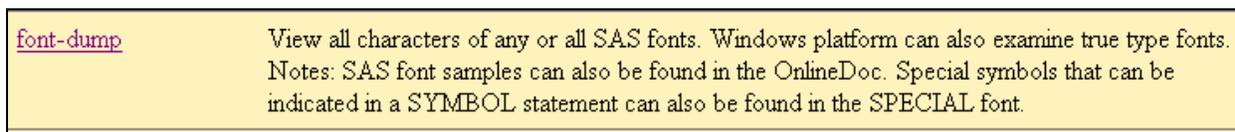
**Code Created in SAS Windows.** There are a few windows in the Windowing environment that use point and click to generate results. Some of these windows are Graph-N-Go, the Query window, and Analyst Application. They have the capability to also save the SAS code that generated the result. You can save the code to review and learn from it or to use it as a starting point for further development. To learn how to save the code, review the help for the particular active window by selecting *Using this Window* from the drop-down help menu.

**Code Created in SAS Enterprise Guide.** SAS Enterprise Guide is a Windows client application with a point-and-click graphical interface for reporting, graphing and analysis. As you point-and-click, SAS code is generated in the background. You can review and save the generated code.

**Examples of Code on SAS Resource sites.** Some university, personal, and company web sites also have examples of SAS code. You might have success in finding code by doing a Google search, such as searching for "SAS code Tabulate". For example, I found this page:



Though there were Proc Tabulate examples, this code to do the Font-Dump was also found and was useful for a current project.



**Examples of Code Written At Your Company.** Don't forget to review code that is written at your company. You will want to get your company's standards, if any, for writing and documenting SAS code.

## Conclusion

*Not everything that can be counted counts, and not everything that counts can be counted.* — Albert Einstein

Knowing how and where to find the answer, not necessarily knowing the answer, is an important skill for a SAS programmer to have.

There is a wealth of information about the SAS System ranging from hardcopy books to online discussion groups. This paper gave an overview of the resources available to help you find the answer. Spend some time to become familiar with the many SAS resources. Then when you are pressed for time on a project, you will feel more confident in being able to use SAS resources to find answers.

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