



The Lazy Man's Guide to SAS® Software

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Introduction

The information you need is there in front of you in one of 91 SAS manuals, neatly or not so neatly, arranged in a bookcase. Which one has the information you need? Or maybe the information you need is not even there – information anxiety!

In our title, *The Lazy Man's Guide to SAS*, SAS could stand for Seek and Solve or even Symptom Alleviation Sources for your information anxiety. However, we all know that SAS is not an acronym and is a registered trademark of SAS Institute, Inc.

Changing the vast amount of information matter into meaning requires the skill of knowing how and where to look. In his book *Information Anxiety*, Richard Saul Wurman says "Knowing how to look for information gives you the freedom to find it."

Nine techniques to help you in your quest for answers and solutions will be described. The type of information you are seeking and your own style will determine the technique to pursue first. Also, the first solution found may not be the best solution.

Techniques

We have organized our methods of finding answers by categories into an acrostic spelling the word "technique." These are the ones we use:

T echnical Support
E ducation
C ode
H elp
N otes
I ndexes/Publications
Q uestions
U sers Groups
E lectronic Sources

Technical Support

Technical Support is a two-tiered system. When you need assistance with SAS software, talk to your site's SAS consultant, who in turn can contact the Institute's Technical Support consultants.

SAS software consultants at your organization are responsible for providing assistance in using SAS software. It is important to know who they are. The names of your site's designated SAS consultants are registered with the Institute. You can find out

who they are by using the SITEINFO command in the SAS Display Manager System, by asking at your organization, or by calling the Institute.

The Institute's Technical Support Division. Your site's SAS software consultants are the liaisons with the Institute's Technical Support Division. What this means is they can contact the Technical Support consultants when they need help in answering questions and solving problems.

During our 16 years as SAS consultants, we have found the help given by Technical Support consultants to be timely, helpful, and friendly. If they know of helpful sample code or technical notes pertaining to the problem, they will fax them to you. A just announced on-line fax system will make this service even better.

Several methods of reporting problems to Technical Support are available to the SAS consultant. The one most used and providing the quickest response is the phone. Two electronic methods, EMITS and OCSF, are also available.

EMITS. SAS consultants who have access to electronic mail services such as Internet, MCI Mail, and Sprint can send E-mail to Technical Support using the EMITS system. E-mail questions receive a response within 24 hours. EMITS is our preferred means of communicating with Technical Support because the questions and answers are logged on our system, thus providing a paper trail. Also, it is convenient because we can send off a question late in the day and have the answer early the next morning. The time difference between Hawaii and North Carolina is a disadvantage for telephone calls and an advantage for E-mail.

OCSF. The On-line Customer Support Facility is an electronic bulletin board system (BBS) provided by Technical Support and can be used to report problems. Our experience with OCSF is limited because we have Internet access. Using EMITS and the Institute's anonymous FTP services are more economical and convenient for us. OCSF is currently being upgraded with modem support up to 14,400 bps and a new BBS system.

A new publication, *SAS Consultant's Guide: Supporting the SAS System, First Edition* provides information on services and facilities available to local SAS consultants in order to support their SAS users. It describes effective methods for helping SAS users to find the answer. It replaces Technical Reports U-111, U-115, U-116 and U-117.

Education

Education material is a good and often overlooked source of information. After training, keep and reference the material.

Each time you write and debug a SAS program or when you ask "Can I do this in SAS?", you are learning more about the SAS System. Experience is a good teacher. Keep a log of useful information.

To save time and frustration, we recommend professional training to learn about SAS software. Many modes are available and which one is best for you and your organization depends on many things, such as your budget, the turnover of SAS users, your scheduling flexibility and the way you like to learn.

Video tutorials are available to local SAS users groups to show at their meetings. The lending library currently has 18 different tutorials. The topics include getting started with various products, making the transition to version 6, and "Using SAS Macro Variables." To purchase these videos with student handbooks costs less than \$50 each. Contact your education sales account representative about the free lending library program for users groups.

Academic sites are now receiving significant discounts for video-based and instructor-based courses, Trainer's Kits, and for SAS/TUTOR® in conjunction with ACO (academic computer offer.)

Also a series of getting started books to help us get past the awkward stage of learning are available.

Code

Code can be the problem or code can assist with solving the problem. Sample code is available in many locations for common and not so common tasks.

When the code is the problem, read the log. The log is an important feature of the SAS System and is a problem solver. The log tells the progress of your program, files used, and prints any error messages and notes. It helps you debug your program. Most experienced users know to read the log after each execution.

In our SUGI 18 paper, we had as one of our 180 ideas, "read the log out loud until you can read it with understanding." The week after the conference, one of us kept changing a simple input statement and running the program over and over again but the output always looked the same. The log, when finally read, told the whole story. The SAS library was not being updated. Why? The FSVIEW window had been opened to look at the data set and had not

been closed. An already opened data set member cannot be opened again. We have been told that we teach what we need to learn. Therefore, we will say again, read the log.

After you read the log, fix all warning and error messages. Understand why the notes are occurring. Are they simply informational or do they include a warning? We prefer to get rid of notes with warnings, even if the program runs correctly. There are less notes to read and to think about on future runs.

Write code to explore the data. Your problem may be that the data is not as you assumed or is being read incorrectly. Write code and to calculate simple statistics, like minimum and maximum values and frequency counts, and .to print some of the data.

Try out your code with test data. Write code that you think will work. Run it with test data and check the results. Put comments in your programs to help in understanding your code later.

The SAS Sample Library is an excellent source of code. It is a diverse collection of SAS programs illustrating specific applications or different approaches to programming problems. Most the examples in the SAS manuals are in the library. Running the INDEX program will give a listing with a description of the various programs. Ask your site's SAS consultant how to access the library.

Don't re-invent the wheel. Reference the *SUGI Proceedings*. Read *SAS Communications*® and *Observations*®. There is a lot of code listed in them. Code is also available from electronic sources. If it is what you need, use it.

Use SAS/ASSIST®. You can use SAS/ASSIST to run many procedures. Just point-and-click and fill in the blanks. SAS/ASSIST will generate SAS code with lots of comments for you. You can save the code, edit it, learn from it and use it as a starting point for more extensive coding. It's wonderful and a time-saver for new and experienced SAS users.

Help

Help is at your fingertips and only a keystroke away.

The **HELP** window in the display manager is an on-line menu-driven help facility. It takes a little time to learn how to navigate around the HELP menus, but it is worth the effort. It contains up-to-date information about the current release and often is handier to access than the manuals.

Use your site's on-line help and documents. Many sites write their own help and documents to explain how to use SAS at their site and to give site-

dependent information. Some sites have a NEWS file to alert you to any changes.

The SAS SUPPORT Application, a menu-based AF application, gives you the options of browsing the SAS Notes, accessing programs in the SAS Sample Library, and running a short tutorial about version 6. Your site's consultant will know how to access the SUPPORT Application.

Notes

When you think the problem is with SAS software and not your code, Notes is where to look.

The SAS Notes Library, formally known as SAS Usage Notes, is a SAS data set containing information on outstanding problems, available fixes or workarounds, compatibility issues, corrections to the documentation, undocumented features and common misunderstandings.

SAS Notes can be browsed on-line. The latest SAS Notes data set can be requested by writing the Institute or the data set can be downloaded from the Institute's anonymous FTP. Check with your site's SAS consultant on how to access the notes.

Indexes/Publications

Trivia: The comprehensive manual for using SAS software in 1976 was *The Users Guide to SAS 76*. It has 330 pages and cost \$6.95.

Use the Manuals. First, how do you decide what manuals you need? The Institute's Book Sales Department distributes a free catalog listing and describing documentation available from the Institute and a free brochure titled "What Books Do I Really Need?"

"SAS System Documentation: What Do I Need? What Should I Buy?" by Joe E St Sauver of the University of Oregon Computing Center is also a useful guide. It is available via FTP services from DECOY.UOREGON.EDU in the pub/sas directory.

For information specific to your platform, such as how to use files and how to print, the companion manual is the one to reference. There is a companion manual for each operating environment.

With version 7 of the SAS System, the Institute will offer on-line hypertext manuals, which means there will be a flood of used bookcases on the market.

SAS Communications is a free quarterly news magazine and one means of keeping up-to-date with the SAS System. Each issue of *SAS Communications* includes a publications list,

technical tips, descriptions of new technology and profiles of companies and their use of the SAS System.

Observations, a superb, quarterly technical journal, contains in-depth articles on using the SAS System. By reading *Observations*, you are being taught by the experts how to use the various software products to their full potential.

Use the Proceedings. Papers, posters and tutorials presented at the annual SUGI conferences are published in a *Proceedings*, available from Book Sales. Full of excellent papers, ideas, and code, they are well worth checking to see if someone else's experience can benefit you.

Use the indexes. With the wealth of documentation about the SAS System in 1994, the indexes are often the keys to finding the information desired. Separate indexes are available for the manuals the *Proceedings* and *SAS Communications*.

The index for *SAS Communications* is available from several sources electronically. This will be covered under "Electronic Sources."

An index for *Observations* is currently planned in conjunction with the third quarter 1994 issue. Thereafter, the index will be updated annually. This index will be provided without charge.

Questions

This technique is concerned with asking questions, asking the right questions, asking the questions right, and asking the questions of the right person.

Wurman gives three principles to help avoid information anxiety. They are: learn to accept your ignorance, pay more attention to the question than the answer and never be afraid to go in the opposite direction to find a solution.

Admit ignorance and ask questions. When you can admit that you do not know, you are more relaxed to receive new information and are more likely to ask questions that will enable you to learn and understand. Unfortunately, in our culture, we tend to live in fear that our ignorance of a subject will be discovered. Often we pretend that we really understand what a new or old buzzword, like client-server or information superhighway, really means.

When asking other people, be cautious about the answers given by someone, unwilling to say "I don't know." You can probably sense when this happens. A lot of time has been lost using incorrect information given with a definite voice of authority instead of with "I think" or "try this."

Pay attention to the question. When asking others, are you sure they understand what you mean when you say what you say? Are you sure the question answered is the question asked? Are you asking the right questions?

Also, be clear about words and the definitions being used. Some buzzwords are so overused, like client-server or information superhighway, that they have lost their definition and have totally different meanings to different people.

Ask the right person. For example, it is better to ask a statistician to interpret the output from statistical procedures and recommend the proper statistics than to ask the non-statistician computer specialist.

There are a lot of helpful SAS people out there: your local consultants, your colleagues and members of SAS users groups. Ask them and be prepared to answer questions about what you want and about your data.

Another source of information is your SAS Software Sales Account Representative. They can inform you about and send sales information on current and forthcoming products. They also know prices. Regional SAS offices occasionally hold local informational sales presentations.

Ask yourself. Often the place to start looking for answers is with yourself. For example, if the program once worked and no longer does, then the question to ask yourself is "What changed?" Something must have changed – it could be simply different data or something as far fetched as a change in the operating system.

Wurman's principle of going in the opposite direction applies when asking yourself. Ask yourself "How can I look at this from an opposite perspective?" "What if I do it differently?" Looking at things differently inspires discoveries and is a way of testing an idea to see if it works.

Finally, remember to use your past experiences, your intuition and your own log of useful information when you start talking to yourself.

Expect to find a solution. Now, here's a question for you. Do you approach problems expecting that you cannot find a solution? Do you get what you expect? If so, then shift your attitude to approach each problem *expecting* to find a solution. However, sometimes the solution may not be what you are willing to commit to in time and resources. Dare we say, sometimes, the solution does not use SAS.

Users Groups

Are you willing to share your SAS knowledge, code and experiences? Do you like to talk to other SAS users about their applications? Is learning new ways fun for you? If your answer is "yes" to just one, participation in a SAS users group is for you.

Over 200 in-house, local, regional, and special-interest groups have formed all over the world. What if there is not a users group in your area? If you have the interest in starting a users group, then contact Sally Roberson at the Institute. Her E-mail address is SASSAR@MVS.SAS.COM. The Institute will send you a start-up kit and provide advice and assistance in starting a group. After the group is formed, the Institute continues the support by occasionally providing speakers for your meetings and sending SAS News videos and training videos to show at the meetings.

SAS-L is the most active SAS users group. It is an electronic discussion list. Approximately 20 to 50 messages are sent to SAS-L daily. The SAS-L archives is a superb source of information. Searching the archives will be covered under "Electronic Sources."

Conferences, include the SUGI conference and annual conferences held by the regional users groups. A list of the 1994 dates and locations is in the First Quarter 1994 *SAS Communications*.

The conference demonstration area is a must! You can see and use the current and future products. Bring a SAS problem to the problem-solving booth and see a Technical Support consultant or a software developer in action solving a problem.

The SAS-L Users Group is having a BOF on Tuesday night at SUGI 19. It is being promoted as entertaining "in the most outrageous and creative ways legal." The only thing that will keep us from attending is a time conflict with the SAS Bowl.

Electronic Sources

Information is everywhere, particularly on the Information superhighway. Electronic access can be via electronic mail, Internet access or using a modem to access a bulletin board.

SAS-L is an electronic discussion group and a way to ask questions of many people interested in SAS. It uses LISTSERV, a list server, and requires e-mail access. Over one thousand people subscribe to this list and many more people view the messages through a news reader in the COMP.SOFT-SYS.SAS USENET newsgroup.

SAS-L Archives is the repository of . previous messages of the SAS-L group. You can search the archives by sending a search request to **LISTSERV@MARIST** such as

```
//SEARCH JOB ECHO=NO
DATABASE SEARCH DD=RULES
//RULES DD *
SEARCH GIS MAPS -
  IN SAS-L -
  SINCE JULY 1993
INDEX
PRINT
```

This request found 16 messages, including 2 with the word "registration", which, as you can see, contains the letters "gis".

TSNEWS-L is a **LISTSERV** that you can subscribe to in order to receive timely announcements and information from the Institute's Technical Support Division. You can also request files such as the technical notes and the *SAS Communications* index.

Subscribe and request notification of new notes by sending the messages to **LISTSERV@VM.SAS.COM** :

```
SUBSCRIBE TSNEWS-L Your Name
AFD ADD * TECHNOTE TSNEWS-L PW=password
```

To get the *SAS Communications* index send:

```
GET SASCOMM1 ANNOUNCE
GET SASCOMM2 ANNOUNCE
```

Technical Notes are informal documents that discuss problems and topics not covered in the Institute's publications. They are available from **TSNEWS-L** and the Institute's anonymous FTP.

The Institute's FTP services at **FTP.SAS.COM** is available to any user with the ability to FTP (File Transfer Protocol). You can use anonymous FTP to download files, such as SAS Notes, technical notes, compiled code, zaps, and the *SAS Communications* Index. To use this service, you need to be familiar with standard FTP commands.

The technical notes are located in the directory **technote** under **techsup/download**. The directory **misc** contains some SAS programs and useful articles. Incidentally, **perform.ps**, which is a postscript file, is on "Windows 6.08 Performance Issues."

The **Internet Gopher** is a client/server protocol for accessing information servers throughout the world. Gopher was initially developed by the University of Minnesota and has grown into a world-wide information system used by thousands of Internet users. The key to its success is its quick and easy access to information. You must have a gopher client, a program that request the information from the server.

The server **TJGOPHER.TJU.EDU** has access to SAS programs, the Institute's FTP services, and various documents. Gopher to this server and burrow down through the various menus "Thomas Jefferson University", "Information Services", "Information Center", "Statistical Software" to the menu "SAS Info."

The **Journal of Statistics Education Information Service** (**JSE.STAT.NCSU.EDU**) has access to a collection of SAS macros, programs, and other useful tools. Burrow down to "SAS Software Archive."

SAS Bulletin Boards. Ben Conner is giving a paper at this **SUGI** on "SAS Software Oriented BBS Systems: Online Help 7 Days a Week."

"The One-Eyed Guide to Internet, E-Mail, **LISTSERV**, **SAS-L**, and **EMITS**" by Michael Davis is highly recommended reading. The title tells all. It was published in the **SUGI 18 Proceedings**. You can get a copy via the **TJGOPHER** or send the message **GET ONEEYE GUIDE TO LISTSERV@ALBANYDH2.BITNET**.

Scenarios

Now that you are armed with nine solution-finding techniques, it is time for **S A S - seek and solve**.

Let's look at some typical scenarios and the various pathways we traveled to find the answer. When a technique provided a particularly good answer, we flagged it with "BINGO!"

Scenario 1: The column headings in my PROC PRINT are splitting differently than before. My output is different from last year's run.

Type of information: **Changes**.

Useful techniques:

- Ask yourself what changed when your program no longer works as it worked before.
- Check the code.
- Use the manuals: the reference guides, the companion manual, and the changes and enhancement technical reports.
- Search the SAS Notes. (BINGO!)
- Ask your site's SAS consultant, who can call SAS Technical Support. (BINGO!)

Scenario 2: The output prints 80 columns across and 21 lines down per page. The examples in the manuals use more of the page. What's wrong?

Type of information: **Setup at my site**.

- Ask yourself the question "Has someone been using my computer and changed something?"
- Read the on-line help and news of any changes to the operating system or to SAS software. Review the documents written by your site.
- Read the companion manual for your platform.

- Run PROC OPTIONS, print the configuration file, print the command file that calls SAS (BINGO! – pagesize and linesize options are set too small.)
- Ask your site's SAS consultant. (BINGO!)

Scenario 3: I was told to use Cronbach's alpha to test the reliability of my data. What is it? Can SAS do that and if so, how?

Type of information: Statistical and how to.

- Look it up in statistics books.
- Talk to your local statistician.
- Look it up in the manuals and proceedings indexes. (BINGO! - There's an excellent paper presented at SUGI 15 on this topic.)
- Ask your site's consultant. (BINGO!)
- Run SAS/ASSIST. (BINGO!- it's the alpha option in PROC CORR.)
Search the SAS-L archives. (BINGO!) - There was a lot of discussion on this because it was a new feature with version 6.)

Scenario 4: I need a table summarizing my data. Do I use Report, Tabulate, SQL or put statements?

Type of information: Recommendations on how to proceed.

Useful techniques:

- Ask yourself questions and clarify what is needed. This is an example of using one of Wurman's methods of "going in the opposite direction". For example, you might ask "What if I didn't produce a report? What if I didn't produce a report but produced a plot instead? What if the report is not on paper but is generated on the screen as needed?"
- Run SAS/ASSIST. Save the generated code.
- Read articles in *Observation* and *SAS Communications*. (There is an excellent 33 page article in the First Quarter 1994 *Observations* titled *Writing Reports with SAS Software: What are Your Options?* It is a gold mine to help you decide which reporting facility to use. Also the First Quarter 1994 *SAS Communications* has an article titled *The SAS System Expands Report Writing Capabilities*. (BINGO!)
- Look at the examples in the SAS manuals.
- Use the training materials. Attend the course or buy the course notes on SAS Report Writing. View the SAS videotape "Getting Started with PROC Report".

Scenario 5: I remember that SAS is coming out with some visualization products. When will that be and what can they do?

Type of information: Future direction of SAS.

Useful techniques:

- View the SAS News videotapes sent to the SAS users groups.
- Attend the opening sessions at conferences and visit the demonstration areas. (BINGO!)
- Call your SAS account representative. (BINGO! Literature will be sent to you.)

- Look at the results of the SASware Ballot® published in the SUGI Proceedings. The Institute values feedback from the SAS users.
- Read *Observations* and *SAS Communications*. (BINGO!)
- Search the SAS-L archives. Ask the SAS-L list. (BINGO! Many messages are on the new product SAS/GIS for displaying geographical data.)

Scenario 6: My program doesn't work correctly. I've been reading the manuals for days. What do I do now?

Type of information: Debugging and coding. Useful techniques:

- Read the log. Correct all errors. Correct or understand the reason for all warnings.
- Take a break from the manuals, explain the problem to someone else or to yourself out loud.
- Search the SAS Notes.
- Search SAS-L archives. Then ask SAS-L.
- Talk to your site's SAS consultant. (BINGO!)
- Review the *SAS Programming Tips* manual.

Conclusion

We have just solved six problems, using a variety of techniques, ranging from using Technical Support to searching the SAS-L archives. Remember you don't have to know everything, you just need to know how to find it.

Acknowledgments

We thank Technical Support Division at the Institute for quickly answering questions that we had about items in our paper. We thank Christopher Chi-Chung Ma for creating and drawing the characters in the slides.

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