The Lazy Man's Guide to S-A-S

Ginger Carey University of Hawaii Computing Center, Honolulu, HI
Helen Carey University of Hawaii Computing Center, Honolulu, HI

Introduction

The information you need is there in front of you in one of 94 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 S-A-S*, S-A-S 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.

Technique

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 Software 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 Software 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 17 years as SAS Software 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. This year the Institute implemented an online fax system, which makes the service even better. The online fax system can be used to request information on an active problem, that is, a problem with a tracking number.

Several methods of reporting problems to Technical Support are available to designated SAS Software Consultants. The one most used and providing the quickest response is the phone.

Two electronic methods, EMITS and SIBBS, are also available.

EMITS. SAS Software Consultants who have access to electronic mail services such as Internet and MCI Mail can send questions via E-mail to Technical Support using the EMITS system. These 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. 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.

SIBBS. The SAS Institute Bulletin Board System is an electronic bulletin board system provided by Technical Support. SIBBS replaced OCSF, the Online Customer Support Facility, in June 1994. SIBBS can be used to report and track problems, upload files pertaining to reported problems and download fixes for known problems. Our experience with SIBBS is limited because we have E-mail access. Using EMITS to report problems is more economical and convenient for us.

A new publication, *SAS Consultant's Guide: Supporting the SAS System, First Edition (#C55064, $8.00)* provides information on services and facilities available to onsite SAS Software 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

To save time and frustration, we recommend professional training to learn about SAS software. Many modes are available. 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.

SAS Training, published semi-annually, is a catalog of the training courses and materials available from the Institute. To request *SAS Training*, call the SAS Mailing List Coordinator at 919-677-8000.

Training material is a good and often overlooked source of information. After attending a SAS course, keep and reference the course material.

If you cannot attend a SAS course, you may still find the information and examples in the Course Notes helpful, even though it is not all of the information presented in the course. Available Course Notes are listed in *SAS Training* and the *Publications Catalog*.

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 your own log of useful information and write in your manuals your own notes and insights.

Video tutorials with student handbooks can be purchased for less than $50 each. Currently there are 18 different tutorials. The topics include getting started with various products, making the transition to version 6, and using SAS macro variables. These videos are available to local SAS users groups to show at their meetings free of charge. 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 the SAS/TUTOR® PLUS option in conjunction with ACO (Academic Computer Offer.)

The Getting Started Series of Books (GS series) are available to help us get past the awkward stage of learning. They are for users of a new product to help them become productive quickly without being frustrated with the large number of manuals available for that product. The Institute's goal is to have Getting Started books for every product. Currently eight products are covered.

Code

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

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 when the program runs correctly. There are less notes to read and 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 to calculate simple statistics, like minimum and maximum values and frequency counts, and to print some of the data.

Run 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.

Don't re-invent the wheel. Code is available from many places. 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. This is covered under "Electronic Sources." If the code is what you need, use it and learn from it.

The SAS Sample Library is another 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.

If you are using release 6.10 of the SAS System, the sample programs are available under the Help Menu. They are listed with descriptions so that it is easier to find the sample program you want. Running the INDEX program will give an index of the sample programs with their descriptions. Ask your site's consultant how to access the library.

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 online 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.

Release 6.10 of the SAS System supports native help format within the SAS System. This makes the helps easier to use. The sample programs in the SAS Sample Library are available under the Help menu. You can cut and paste parts of the sample program into your application.

Use your site's online help and documents. Many sites write their own help and documents to explain how to use SAS software at their site and to give site-dependent information. Some sites use the 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, previously known as SAS Usage Notes, is a SAS data set containing information on outstanding problems, available fixes or workabouts, compatibility issues, corrections to the documentation, undocumented features and common misunderstandings.

SAS Notes can be browsed online. Your site's consultant can request the latest SAS Notes data set by writing the Institute or by using SIBBS to make the request. The data set can be downloaded from the Institute's anonymous FTP. Check with your site's 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 the cost was $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 Communications,* a free quarterly magazine, describes the new books for that quarter and also lists all Institute publications. The *Publications Catalog* is distributed semi-annually. To get on the mailing list, call Book Sales at 919-677-8000 ext. 7001. All training manuals are listed in *SAS Training* and the *Publications Catalog.*

"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 online hypertext manuals, which means there will be a flood of used bookcases on the market.

SAS Software: Abridged Reference, Version 6 is for intermediate SAS users who don't want to carry around manuals for base SAS, SAS/AF®, SAS/FSP, SAS/GRAPH® and Screen Control Language (SCL). In a manual about one-tenth the size of those manuals combined, it's a compact reference (610 pages, about the size of a notebook computer) to the most commonly used features of those products.

SAS Communications is a quarterly news magazine and a means of keeping up-to-date with the SAS System. Each issue of *SAS Communications* includes a publications list, technical tips, the latest news on products and services, descriptions of new technology and profiles of companies and their use of the SAS System. Be

sure to subscribe to and read the *SAS Communications*. It's free.

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*.

You can save time by referencing *The Master Index to SAS System Documentation, Version 6*, to locate information in any of the SAS Version 6 documentation. You will also become aware of other manuals that you might need. When you have a number of *Proceedings* that you reference for articles relevant to your project, then the master index for the *Proceedings* is also a time-saver.

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

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

The Reference Library Service has been worth the cost! It is a one year service of automatically receiving new publications as they are published and it includes the shipping. You get the manuals as soon as they are available. Also you do not have to fill out paperwork to order each new manual. Finally, with so many new manuals coming out each year, you can save on the cost of the manuals.

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 GIS or data warehouse really means. Don't be afraid to say, "I don't understand what you mean, please run that by me again."

When asking other people, be cautious about the answers given by someone, unwilling to say "I don't know." Hopefully, you can 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 "maybe this will work."

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. About 15 to 30 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 annual SAS Users Group International (SUGI) conference and conferences held by the six regional users groups. The conference demonstration area is a must, as is the opening/welcoming session and the SAS Bowl! In the demo area, you can see and use the current and future products and talk to Institute staff. At the annual SUGI conference, you can bring a SAS problem to the problem-solving booth and see a Technical Support consultant or a software developer in action solving a problem.

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 the SAS System. 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.BITNET, such as:

```
//SEARCH JOB ECHO=NO
DATABASE SEARCH DD=RULES
//RULES DD *
SEARCH GIS MAP -
  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 Institute publications. They are available from TSNEWS-L and the Institute's anonymous FTP.

SASDOC-L is a LISTSERV maintained by Publications. It is part of their *SAS Online Samples,* a facility for getting sample code from selected books. To subscribe and get an index of examples, send to LISTSERV@VM.SAS.COM the messages:

```
SUBSCRIBE SASDOC-L Your Name
GET INDEX EXAMPLES SASDOC-L
```

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. First connect to FTP.SAS.COM via FTP. When prompted for user, type *anonymous*. Respond with your E-mail address to the password prompt. To change to a directory, use the CD command with the directory name. Use the DIR command to list the contents of the directory and the GET command to download a file. File names are case-sensitive. Get the README files for more information. Type QUIT to exit FTP. For example:

```
cd techsup/download
dir
cd technote
dir
get README.technote
quit
```

The Technical Notes are located in the directory technote under techsup/download. The directory techsup/download/misc contains some SAS programs and useful articles. Incidentally, the file ghostv.exe is a postscript file viewer. To get binary files, first issue the BINARY command.

The sample code from selected books (Publications Division's *SAS Online Samples)* are located in the directory pub/publications.

The Internet Gopher is a client/server protocol for accessing information servers throughout the world. Gopher, initially developed by the University of Minnesota, has grown into a world-wide information system used by thousands of Internet users. The key to its success is quick and easy access to information. You need 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 though the various menus *Thomas Jefferson University, Department of Information Systems, Information Center, Statistical Consulting Services, Software ..., including SAS* to *SAS Info.* (The menus may change.)

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

Bulletin Boards. The SAS Institute Bulletin Board System, SIBBS, provides you with dial-up access to services of the Institute's Technical Support Division. SIBBS supports high-speed modems up to 14,400 bps. The phone number is 919-677-8155.

For information on other bulletin board systems, read Ben Conner's paper "SAS Software Oriented BBS Systems: Online Help 7 Days a Week" presented at WUSS 1993 and SUGI 19.

If you have Internet access, the most resourceful use of the electronic sources is to use EMITS for problem reporting; the Institute's FTP services for downloading files; and SIBBS to update your Site Info online, to request the SAS Notes be mailed to you, and to get information on other BBS's.

"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@ALBNYDH2.BITNET.

Scenarios

Now that you are armed with nine solution-finding techniques, it is time for S-A-S – **S**eek **A**nd **S**olve.

Let's look at some typical scenarios and the various pathways we traveled to find the answer. When a technique provides a particularly good answer, we flag 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. (In this case, the version of SAS changed.)
- 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 Software 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 online 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 the SAS System (BINGO! –pagesize and linesize options are set too small.)
- Ask your site's 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 SAS-L archives. (BINGO! - There was a lot of discussion on Cronbach's alpha coefficient 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 First Quarter 1994 *Observations* titled *Writing Reports with SAS Software: What are Your Options?* It is a gold mine of information to help you decide which reporting facility to use. 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.**

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 consultant. (BINGO!)
- Review the *SAS Programming Tips* manual.

Conclusion

We have just solved six problems, using a variety of techniques, ranging from using services of the Institute's Technical Support Division to searching SAS-L archives.

Remember you don't have to know everything, you just need to know how to find it.

Acknowledgments

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SAS, SAS/AF, SAS/ASSIST, SAS/FSP, SAS/GIS, SAS/GRAPH, SAS/TUTOR, the SASware Ballot, *SAS Communications* and *Observations* are registered trademarks or trademarks of the SAS Institute Inc. in the USA and other countries. ® indicates USA registration.

References

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Authors' Contact

Helen Carey carey@hawaii.edu

Ginger Carey ginger@uhccmvs.bitnet or ginger@hawaii.edu

phone: 808-956-2387
fax: 808-956-2412