

The SAS® UNIX Primer: Some highlights from end-user documentation¹

Invited Paper, South Eastern SAS® Users Group
September 18-20, 1994, Charleston, South Carolina

Gregory S. Nelson
University Computing and Networking Services
The University of Georgia

SAS is a registered trademark or trademark of SAS Institute Inc.
in the USA and other countries.

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

Introduction

Understanding the SAS System with its full complement of procedures and programming capabilities is a phenomenal task for a user at any level. Understanding the environment in which SAS operates is often an equally formidable task. At the University of Georgia, we have attempted to document in a short, concise handout, some of the "environmental" considerations that new users to SAS or SAS users new to the UNIX operating system might find useful when converting or beginning to learn SAS in a new operating system.

This article deals primarily with "using" SAS on computers under UNIX operating systems. Topics include the ways in which a user can "connect" to the UNIX system and the how they can invoke SAS once they get there, pitfalls to avoid and some interesting "low-documented" features of SAS in these environments. Also, some discussion of key mappings, X-windows and applications development environments will be discussed.

This paper was designed and tested using SAS Release 6.09 running in the following UNIX environments:

- SunOS, Solaris 1, Solaris 2 (Sun SPARC)
- AIX® (IBM RS/6000™)

Most of the conventions described in the lessons below, will apply to versions of SAS

running on other variants of the UNIX operating system.

This paper is really an outline with glimpses of another document and therefore should not stand on its own.

Overview of the Course Structure at UGA

Before talking about the SAS UNIX Primer, it might prove useful to place it in context as to how it is used. Several courses are taught each quarter at the University of Georgia (UGA) through University Computing and Networking Services (UCNS). These courses highly recommend purchasing manuals written by SAS Institute and several of the Books by Authors on the SAS System. Needless to say, many of the users in our environment either do not have manuals or end up sharing them with others in their department. The documentation that we have prepared covers general SAS topics in broad strokes. When the user finds themselves needing more detail, we strongly encourage them to break down and purchase the manuals. These general courses include:

Overview of the SAS System

1. Capabilities of the SAS System
2. Basic Principles
3. The DATA Step
4. The PROC Step

Understanding the SAS Environment (3 separate courses: OS/2 & Windows, UNIX, MVS & CMS)

1. Features of the Operating system
2. Modes of execution and invocation
3. Printing
4. Communications

Programming with SAS: The DATA STEP

1. Reading data from raw data files
2. Basic data manipulation with SAS programming statements
3. Data errors and missing values

SAS/GRAPH Workshop

1. Understanding the graphics environment
2. Generating simple charts and graphs
3. Enhancing output
4. Managing output

Advanced SAS Topics: Combining SAS Data Sets

1. Understanding SAS Libraries
2. Concatenating and Merging SAS data sets

Advanced SAS Topics: DATA Step Programming

1. DATA step programming review
2. Using SAS Functions
3. Generating data with DO-LOOPS
4. Processing variables in ARRAYS

Advanced SAS Topics: Macro Programming

1. Understanding Macro Variables
2. SAS Programming: Compilation and Execution
3. Elementary Macro Programming

Understanding the Operating Environment

The goal of all of these courses is to bring people closer to understanding SAS and the operating system specific features of SAS. When we teach these courses, we tend to stress using the Program Editor for learning the SAS because it is easy to get overwhelmed by the OS itself, the editor, batch queues, printing, submitting and retrieving output and managing files. That way, we can concentrate on using SAS and not on learning everything at once.

Since the course which covers the SAS in the UNIX operating system is a self-contained set of materials, they will not be reproduced here. Rather an outline will be presented. The SAS UNIX Primer is available in hardcopy format from the author or anonymous ftp at the University of Georgia (ftp.uga.edu) in the directory /pub/sas/docs.

The SAS UNIX Primer

- I. Introduction
- II. The SAS System Overview
- III. The UNIX Operating System
File manipulation and other useful UNIX commands
- IV. The SAS System in the UNIX Environment
 - A. Methods of submitting SAS programs
 - B. Understanding Terminal Emulation
 1. Running SAS on Asynchronous Devices
 2. Running SAS Under X-Windows
 - C. Using Host Editors other than the Program Editor
 - D. Printing from the SAS System
 - E. Producing Graphics
 - F. Tuning the SAS System under UNIX
 - G. Features of the UNIX Operating System
 - H. SAS and TeX
 - I. Some Differences Between Other Operating Systems
 1. Differences between SAS on UNIX and the DOS 6.04 Version
 2. Differences between SAS on UNIX and the an IBM Mainframe
 3. Moving SAS files to and from other operating systems

V. References

VI. Appendix - SAS and UNIX Utilities

¹Note: Special thanks to Glenn Leavell and the Workstation Support Group for their technical support. Also a note of thanks to Joseph Kelley and George Matthews for their assistance in reviewing the SAS UNIX Primer.