A SAS COLORING BOOK AS A TEACHING AID

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1. INTRODUCTION

During the past two years, we have developed a new form of CAI: Cartoon Assisted Instruction. This approach has been well received by our users who are, by and large, non-statisticians with no prior exposure to data processing.

First, we'll review the use of SAS at United Airlines. Then, we'll outline our training package tailored to our needs. Finally, we'll show how cartoons are used in an introductory class.

2. SAS AT UNITED AIRLINES

SAS was introduced in 1978 by the Operations Research group and has remained a tool for non-programmers. The major exception is the Computer Performance area. SAS is appreciated primarily for its data management capabilities. In particular:

- The user, with minimal training, can combine information from several files in a single run.

- The user can summarize a large amount of data easily.

3. SAS TRAINING AT UNITED

3.1 Overview

SAS training is offered as a progression of 4 modules. The first 3 emphasize data processing techniques, whereas the last one is devoted to an overview of regression analysis. The introductory module has been tailored to United's needs and covers, for example, data reduction techniques and other items which are often considered as "advanced" material.

3.2 Cartoons as a Teaching Aid

Each milestone of our introductory class has been illustrated by a cartoon. The major ones appear below. The cartoons themselves, are given in Appendix 1.

- Cartoon No. 1: Rectangular Data Matrix

  SAS procedures operate only on columns. Hence, setting up the data matrix properly has far-reaching consequences. For example, accountants tend to consider time series information row-wise instead of column-wise.

- Cartoon No. 2: SAS and OS Files

  The distinction between OS and SAS files often eludes beginners but is crucial. This cartoon also demonstrates the fundamental logic of SAS. A program is a succession of DATA and PROC steps. SAS procedures can only be used on SAS data sets.

- Cartoon No. 3: Data Summarization

  It shows that a SAS procedure can create an output file which can be further processed with SAS. The "compressor" is, in practice, PROC MEANS or PROC SUMMARY statement.

- Cartoon No. 4: The DDNAME Mystery

  DSNAME and DDNAME are a source of deep confusion among beginners, and yet, in an environment where the corporate data bases are on disks or tapes, this problem must be dealt with in an introductory class. The example below states the problem in a nutshell:

    //EXAMPLE DD DSN = EXAMPLE.DAT
     /DISP = SHR

    //SYSIN DD *

    DATA EXAMPLE;

    INFILE EXAMPLE;

If cartoon No. 1 is effective, the student should have no difficulty distinguishing between names of SAS and OS files. To introduce the DDNAME concept, we rely on the mailbox analogy (see Cartoon No. 4).
4. CONCLUSION

Since cartoons have demonstrated their value as a teaching aid, we have replaced all flowcharts with cartoons in our introductory class.

In summary:

- They are a good attention getter.
- They introduce a touch of humor.
- They minimize the use of jargon.

The author would like to thank Bob Kosinski of the United Airlines Audio-Visual Department for the superb cartoons — often requested on short notice. He is also grateful to Sally Carson of the Rand Corporation for prodding him to make this presentation.
| YEAR | CONSULAR | OIL  
|------|----------|------
| 1960 |          |      
| 1970 |          |      
| 1977 |          |      
| 1980 |          |      

**RECTANGULAR DATA MATRIX**

UNITED AIRLINES