SAS PROGRAMMING UTILITIES USING SAS/AF AND SAS/FSP

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ABSTRACT
SAS/AF and SAS/FSP provide the tools to build interactive programming utilities. This paper describes two such utilities. One assists in the management of permanent in-house SAS formats. The other allows users to reposition variables in their SAS datasets.

INTRODUCTION

FSFORMAT is our utility to manage permanent in-house SAS formats. This utility uses SAS/FSP, SAS/AF, and PROC PMLLIB to allow creation and editing of formats. Format library management facilities can be used to list, print, or delete formats. New formats can also be created from SAS datasets.

SAS Version 5 introduced an interactive option for PROC DATASETS. While useful, this procedure could not be used to change the type or length of variables, or change their positions. It also lacked the ability to add or delete variables. At SUGI 10 Gary Vair of IBM presented FSCONTENTS, a SAS/FSP utility that provided all of these capabilities, except changing the position of variables. Using SAS/AF we were able to assemble and enhance these utilities into our Restructure Datasets catalog. This paper describes an AF interface built around these utilities and a program to reposition variables.

THE SAS PRIMARY MENU

Upon logging in at our site, SAS is automatically invoked through a CLIST and an AUTOEXEC program displays the SAS Primary Menu.

FORMAT LIBRARY

The FSFORMAT facilities are accessed by selecting F from the Programming Utilities Primary Menu. The FSFORMAT facilities are accessed by selecting F.

DETAILS OF IMPLEMENTATION OF FFSFORMAT

The FSFORMAT facilities reside in a SAS catalog called FORMAT. A PROC BUILD invoked on this catalog would yield the following:

DIRECTORY FOR CATALOG: SASSYS,FORMAT

COMMAND: ----

NAME TYPE DESCRIPTION
-- PRIMARY MENU PROC BUILD ON FORMAT CATALOG 12AUG87
-- EDIT PROGRAM EDIT FORMAT 26JUL87
-- FMTDATA PROGRAM CREATE FORMAT FROM SAS DATASET 26JUL87
-- LIST PROGRAM LIST ALL FORMATS 05AUG87
-- PRINT PROGRAM PRINT OR BROWSE A FORMAT 26JUL87
-- CFORMAT SCREEN SCREEN FOR CHARACTER FORMATS 26JUL87
-- MFORMAT SCREEN SCREEN FOR NUMERIC FORMATS 26JUL87

The first catalog member displayed by selecting F from the Programming Utilities Menu is the FSFORMAT primary menu.

PRIMARY MENU

If the Primary Menu was selected in a PROC BUILD and the ATTR command was given, the result would be the following screen:

ATTRIBUTES FOR MENU & CRT SCREENS

COMMAND: ----

PARENT SCREEN NAME PRIMARY TYPE MENU

LIBREF CATALOG

BUILD PROGRAM

With the SASSYS Library allocated in OLD, PROC BUILD can be called from the Primary Menu to add or edit programs.

LIST PROGRAM

A print of all in-house formats in the format library is sent to the screen to show what formats are available.
The list program can also be used to verify the spelling of existing formats for modification with the edit program.

**EDIT PROGRAM**

After a format name from the format list is entered, PROC FMTLIB outputs a SAS dataset containing the format values. PROC FSEDIT is then invoked to allow editing of the format. If the format does not exist, it will be created. While the FSEDIT procedure performs well for data entry and locating individual values, PROC FSCALC would be preferable for tabular reviewing and editing of a large number of format entries.

The list program can also be used to verify the spelling of existing formats for modification with the edit program.

**PRINT PROGRAM**

Entering an existing format name produces a print showing the labels associated with the format values. The %BEGPRT uses PROC PRINTTO to route the PROC PRINT output to a file. %MENUPRT displays a SAS/AF menu which allows the output to be browsed and sent to a selected printer.

**FMTDATA PROGRAM**

This program allows the creation of a format from a SAS dataset. The user specifies one variable in the dataset as the format value and another as the associated format label.
DETAILS OF IMPLEMENTATION OF THE RESTRUCTURE DATASETS CATALOG

The dataset restructuring facilities are accessed by selecting R from the Programming Utilities Menu. These facilities reside in a SAS catalog called RESTRUC. A PROC BUILD invoked on this catalog would yield the following:

```
PROGRAM
LIBRARY SASSYS.RESTRUC
```

PRODCOMMAND / FIELDS:(NAME OF DATASET) / REGION (NAME OF DATA SET)

Normally, the allocation will succeed and the dataset selection program will be displayed.

SELECT PROGRAM

The libref is a protected field shown for reference, that is automatically filled in using an associated macro variable. The SAS/AF command DIR is issued if the dataset field is left blank.

```
LIBREF SELECT
```

Press PF3 to return to the Programming Utilities Primary Menu.
After a dataset has been selected, the restructuring facilities primary menu is displayed.

**PRIMARY MENU**

PROC DATASETS is invoked on the entire library with the member type option equal to DATA. In addition to its normal function, this provides more information than the DIR command for dataset selection. The TL option invokes an FSEDIT based utility similar to Gary Vair's FSCONTENTS on the selected dataset. The P option invokes the variable repositioning utility. The S option displays the SELECT PROGRAM so that multiple datasets can be restructured.

Selecting P displays an initialization program for the repositioning utility.

**INITPOS PROGRAM**

The repositioning facility requires the variable names to be loaded into macro variables for display on an AF program screen.

```
PROC CONTENTS DATA=SASLIB..DATASET
  MEMBER=MEMBER LABEL=LABEL TYPE=TYPE LENGTH=LENGTH
  NODATA
RUN;
```

```
PROC SORT DATA=DATAAXXCOUNT;
  BY NPOS;
RUN;
```

```
DATA _NULL_;
  LENGTH EOL $ 3 LENGTH $ 3 TYPECHAR $ 1;
  SET AXXCOUNT END=:
  CNT=1;
  CALL SYMPUT('LENGTH','(LEN$ REPEATEQUAL($LENGTH));
  CALL SYMPUT('TYPECHAR',CHRACTYPE($TYPECHAR));
  CNT = CNT + 1;
  CALL SYMPUT('COUNT',CNT);
  CALL SYMPUT('NAME',NAME);
  CALL SYMPUT('VARCOUNT',VARCOUNT);
  CALL SYMPUT('LENGTH',LENGTH);
END;
```

```
PROC DELETE DATA=DATAAXXCOUNT;
RUN;
```

```
PROC DISPLAY CHS=SYS..PSCONT..POS.PROGRAM;
RUN;
```

After loading the variable names into macro variables, the position editor is displayed.

**POS PROGRAM**

Variables can be repositioned using SPF editor style line commands. M, MA, A, and B are supported. If the dataset contains more than 15 variables, function keys can be used to scroll up or down. Only 15 macro variables are displayed and scrolling is performed by substitution. This results in less resource consumption than an extended AF screen with too many fields. The SPF find command is simulated by a user input field. It is useful for moving variables in datasets with many variables. Line command errors are flagged. Once the variables are in the desired order, ending out of the position editor will restructure the dataset.

In addition to controlling the default variable layout in PROC PRINT, repositioning variables can also help when browsing data using PROC DATASETS. With very large datasets, the position of the variables can be important if the system sort utility called by PROC SORT at your site is SYNCSORT. SYNCSORT requires all BY variables to be located within the first 4096 bytes of the observation.
and easy incorporation of new ideas encourages users to develop their own applications. Even for experienced programmers, these utilities save time and reduce programming mishaps.

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