INTRODUCTION

The SAS Data Set Facility was created to aid both our TSO users who are proficient in SAS programming, as well as those users with little or no SAS programming skills, in benefitting from the features which are available through SAS. The facility simplifies the process of working with SAS data sets, invoking SAS functions, and executing SAS programs in the foreground. It accomplishes this through the use of SPF panels, skeletons, and clists. The SAS Data Set Facility has been incorporated into the TSO system's SPF at Commonwealth Edison and is intended for use in an MVS TSO environment.

BACKGROUND

Commonwealth Edison is a large electric utility serving Northern Illinois. There are about 2000 active users of Edison's computer system, more than half of which have little or no programming skills. The programs they run and reports they produce are created for them by the Computer System's staff as they are required.

The Computer Resource Information Center was created at Edison to help novice computer users develop their computer skills and become more self-sufficient in their programming needs. SAS has been recognized as a very valuable tool for computer users at Edison, and the CRIC area thought it would be a good idea to develop a menu-driven system which would encourage users to familiarize themselves with SAS. The Commonwealth Edison SAS Data Set Facility was the system developed to fulfill this need. In order to induce users to utilize the new facility the CRIC area has written a user's guide to take users through the different options available on the primary menu panel, and a number of presentations on the facility have been given at Edison's SAS Users Conferences.

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USING THE FACILITY

TSO users wishing to take advantage of the SAS Data Set Facility select option 4.3 on the SPF primary menu. This displays the primary selection menu of the facility which is shown below. The options give users the ability to create, delete, modify, edit, and browse SAS data sets, run SAS programs and interactive SAS statements in the foreground; and invoke the FSCALC spreadsheet procedure.

--- SAS DATA SET FACILITY ---

1. CREATE A NEW SAS LIBRARY OR DATA SET USING FSEDIT
2. DELETE AN EXISTING SAS DATA SET
3. MODIFY AN EXISTING SAS DATA SET
4. DISPLAY INFORMATION ABOUT AN EXISTING SAS LIBRARY OR SAS DATA SET
5. CREATE A REPORT FROM AN EXISTING SAS DATA SET
6. RUN AN EXISTING SAS SPC OR IN THE BACKGROUND
7. INVOKE FSCALC

Press enter to proceed or press exit to exit this panel.

Option 1 is selected if a user wishes to create a new SAS data set. The following panel is displayed requiring the name of an existing or new SAS library, an indication as to whether the library exists, the SAS data set name, and an option to list the SAS data set records after creation. After enter is pressed, the CLIST logic automatically creates the SAS library if it is new.

--- CREATE A SAS DATA SET ---

ENTER THE FOLLOWING INFORMATION:

ENTER EXISTING SAS LIBRARY NAME OR
THE NAME OF A NEW LIBRARY TO BE ALLOCATED
ON YOUR ACCOUNT:  

NAME OF SAS LIBRARY ALREADY EXISTING:  

NAME DATA SIT NOW WITHIN THIS SAS LIBRARY:  

DO YOU WANT TO LIST YOUR SAS DATA SET AFTER CREATION?  

Press enter to continue processing or press exit to exit.

570
The next panel displayed lets the user define the variables to be included in the SAS data set. Along with variable name, the variable input definition is required. This can be specified very simply by indicating whether the variable is character or numeric and supplying a width, or the user can indicate that an informat is to be selected from a list of numeric, character, or date/time formats.

If the variable is to be given a date/time informat the following is displayed through use of the SPF TBDISPL function. A user can scroll up or down the list of informats. When the one that is desired is found an 'X' should be entered in the WIDTH column next to that informat. A width for the informat can be specified or a 'D' left in the WIDTH column if the default width is to be used. If applicable, a decimal value can also be entered.

After enter is pressed, the display panel for date/time formats appears because of the format specification made in the variable description panel. This panel operates in the same manner as the informat panel did.

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After the format is selected, the variable description panel is again displayed. The user can then continue to define more variables to include in the SAS data set, or the default XXXX can be left in the variable name field to indicate that there are no more variables to define. All the variable names, informats, and formats are saved through the use of the SPF TBDISPL function and the use of a temporary SPF table.

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When the last variable is entered the user has one last chance to verify that the variable definitions chosen are correct. The verification panel displays the temporary SPF table containing the defined variables, and allows changes to be made through the use of SPF TBDISPL processing.
Upon exiting from the verification panel, SPF file tailoring is used to generate the necessary SAS code to create the SAS data set with the variables defined. This SAS code is put into and executed from a temporary dataset. After the data set has been created control is passed to FSEDIT so that the user can create records in the SAS data set created. The following is the SPF skeleton used by file tailoring to produce the necessary SAS code.

```
FILE TAILORING:

OPU'ION SOURCE OPTIONS;
  DATA SASFAT.RGN;
  FILE SASFAT;
  IFSYNCH = 1
  INPUT SYNCHED &INFORMATION;
  ENDS;
  IFSYNCH = 0
  INPUT SYNCHED &INFORMATION;
  ENDS;
  END;

INPUT:
  LOOF SASFAT;
  END;
  LOOF SASFAT;
  IFSYNCH = 1
  FORMAT &INFORMATION &FORMAT;
  ENDS;
  IFSYNCH = 0
  FORMAT &INFORMATION &FORMAT;
  ENDS;
  OUTPUT SASFAT RGN;
  CLOSE;
  PROC FSEDIT DATA=SASFAT RGN;
  SCREEN-TOP OPTION=1;
  IFSYNCH = 1
  PROC PRINT DATA=SASFAT RGN;
  ENDS;
```

The CLIST logic in each of the options available in the SAS Data Set Facility, with the exception of the foreground SAS option, is structured in the same manner as the logic in the create option clist. The pattern is:

- a panel is displayed to receive information from the user
- the CLIST loops so that information received is put into an SPF table
- when there is no more information SPF file tailoring uses an SPF skeleton and the SPF table to generate SAS code
- the SAS code is run in the foreground to perform the required function.

**OTHER OPTIONS**

The delete option allows a user to enter any number of SAS data set names to be automatically deleted from a specified SAS library. The CLIST generates SAS code to perform PROC DELETE's on the data sets named.

The option to modify an existing SAS data set displays a menu panel which gives the user a choice of:

1. Adding a variable to a SAS data set
2. Deleting a variable from a SAS data set
3. Deleting records with missing variables values from a SAS data set

The suboption to add a variable to a SAS data set performs the variable definition function with the same panels and CLIST logic as the create option. The defined variables are then added to the records of an existing SAS data set by using the DATA step SRT statement. Variables are deleted from a SAS data set through the use of the DROP statement in the generated SAS code. The suboption to delete records with missing variables allows the user to specify whether the records should be deleted if 'ALL' the variables named have missing values, or if 'ANY' of the variable values are missing. The sort suboption sorts the SAS data set specified by the variables entered on its display panel.

The edit option simply requires the SAS library and data set name to be entered before control is passed to FSEDIT. An optional screen data set name can also be entered in this option.

The display option generates and executes code to perform a PROC CONTENTS On the specified SAS data set or library. A list of variable names in each SAS data set within a library can be requested in the PROC CONTENTS output by an indication made on the display option panel.

The option for creating a report from a SAS data set gives the user an option to sort the report by up to four variables, sum variable values in the report, group the report by certain variables, include only specified variables in the report, and supply up to four title lines. In addition, through the use of SAS macro language the report can be interactively limited to only those records which match user-specified criteria. The reported is produced from a PROC PRINT statement and put into an OUTLIST data set for the user. At this point the user can print up to 20 copies of the report to a local or system printer.

The option for invoking foreground SAS gives the user the ability to run a SAS program from a data set, or by entering code to interactive SAS. This option's panel lets the user specify if SAS macro language is being used so that the macro system options can be included. A user can also include other system options or allocate up to four files to be used by the SAS program. After the program is run the results and log can be
browsed, the program code edited and rerun, interactive SAS can be reinvoked, or the results log, or program can be printed.

A SAS library and data set name are required on the browse option panel. In addition, a SAS screen data set name can also be entered. The SAS code generated and run from the panel input passes control to FSBROHSE.

The final option on the primary menu allows a user to invoke FSCALC. A SAS screen data set name and a SAS data set to be used as spreadsheet input can be optionally entered on the first panel. If a SAS data set does not exist, the spreadsheet dimension and column widths can be entered through SPF panels. Control is then passed to the FSCALC function.

CONCLUSION

The Commonwealth Edison SAS Data Set Facility is a user friendly system which has been a major benefit to users of the Edison computer system. In a given measurement week over one quarter of the 400+ regular SAS users had used at least one of the options on the facility. As new SAS functions are released, they can be easily added to the primary selection menu. In the near future an option to interface to SAS/DLl is planned. The SAS Data Set Facility has proven to be a welcomed enhancement for the Edison computer system.

ADDITIONAL PANELS FOR THE SAS DATA SET FACILITY

Figure 1. Delete a SAS Data Set Panel

Figure 2. Modify a SAS Data Set Panel

Figure 3. Edit a SAS Data Set Panel

Figure 4. Display Information About a SAS Data Set or Library Panel

Figure 5. Create Report From a SAS Data Set Panel 1

573
Figure 6. Create Report From a SAS Data Set

Panel 2

--- CREATE A REPORT FROM A SAS DATA SET: TEST1

FOR EACH OF THE THREE OPTIONS BELOW YOU CAN ENTER UP TO 10 VARIABLES SEPARATED BY BLANK OR LEAVE "ALL".

1) VARIABLES TO SUM IN REPORT => SALARY
2) VARIABLES TO SORT REPORT BY NAME => NAME
3) VARIABLES TO GROUP REPORT BY => NONE

ENTER UP TO 10 VARIABLES SEPARATED BY BLANK OR LEAVE "ALL":

1) VARIABLES TO INCLUDE IN REPORT => ALL

PRESS ENTER TO CONTINUE PROCESSING OR EXIT KEY TO EXIT

Figure 7. Invoke Foreground SAS Panel

Figure 8. Browse a SAS Data Set Panel

--- BROWSE TEST1

PRESS THE FOLLOWING:

SAS LIBRARY NAME WHICH CONTAINS THE
SAS DATA SET TO BROWSE => SALILIB
SAS DATA SET NAME WITHIN THE SAS LIBRARY => TEST1

IF YOU HAVE AN EXISTING SCREEN TO BROWSE THE DATA, ENTER THE FOLLOWING:

THE LIBRARY NAME WHICH CONTAINS THE SCREEN TO USE FOR BROWSE => SALILIB
SCREEN DATA SET NAME => TEST1

PRESS ENTER TO CONTINUE PROCESSING OR EXIT KEY TO EXIT

--- INVOKE FS:CALC PANEL 1

--- INVOKE FS:CALC PANEL 2

--- INVOKE FS:CALC PANEL 3