

CATALOGER: An Application Development Tool to Search, Compare, and Document SAS® Catalogs and Data Files

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Abstract

This paper will present an application written entirely in SAS that greatly enhances the developer's ability to develop, compare, and manage SAS catalog entries and datasets. This application has point and click capabilities for printing catalog entries, including images of frame entries and complete descriptions of associated widgets directly into Microsoft Word® documents, creating publication quality documentation at the push of a button. The batch printing facility allows for printing of all catalog entries of virtually any type, including Program, Source, SCL, and Slist (including expanded sublists) entries. The text searching facility will search through all text-based entries for character strings and allow point and click access to the locations in any catalog entry containing the text string. Additionally, interactive, side-by-side comparisons of catalog entries in separate, independent windows on the same SAS/AF screen greatly enhances the application developer's ability to manage and compare different versions of SAS catalogs.

Introduction

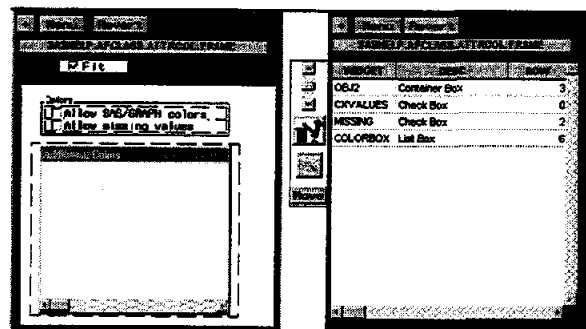
Developing complex applications for use in production environments often entails a full scale effort to manage the progression of code from development, through testing, and finally to the placing of the application into production. Managing three or four versions of the same application in various stages of development is a time consuming, tedious chore that is fraught with perils; i.e. omission of a bug fix, inadvertent updating of a catalog entry, improper synchronization of the application versions, etc. Then, when the application is finally ready to be placed in production, the documentation needs to be written. Often this task is put off until the development is nearly complete because writing complete technical documentation takes a great deal of time and effort, and changes every time the

application changes. Additionally, since the documentation happens after the development of the application, it is often rushed and is not as full and complete as it might be. Therefore, we developed CATALOGER, a SAS/AF application that makes it significantly easier to document and compare SAS catalog entries and SAS datasets.

Creating And Printing Documentation For Frame Entries In Microsoft Word®

Two separately scrollable and zoomable windows allow easy browsing and printing of virtually all SAS catalog entry types. For example, FRAME images may be displayed in scrollable windows, along with complete descriptions of all of the associated widgets in a neat, orderly table.

Figure 1



To create publication quality documentation via Microsoft Word®, click on the Menu push button, select Print All Entries of Type FRAME. The batch printing window is presented, in which the name of the output file is collected and some Word® output options are available. The user may limit the number of entries to process, select a range of entries, or allow all the entries to be documented. The next window lets the user select how much documentation is to be created. The user may select to print the Frame Image, Widgets,

Source, and/or the frame's LIST (including the ability to expand the sublists). The documentation for SASHELP.AFCLASS.ATTRCOL.FRAME in Microsoft Word® would create the following three pages; note there is no SCL entry to document, or there would be a fourth page.

Figure 2 (The FRAME Image)

SASHELP.AFCLASS.ATTRCOL.FRAME
Tuesday, April 15, 1997 5:58 PM

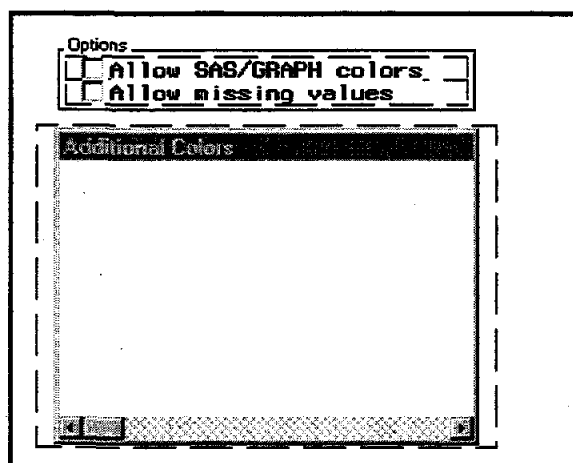
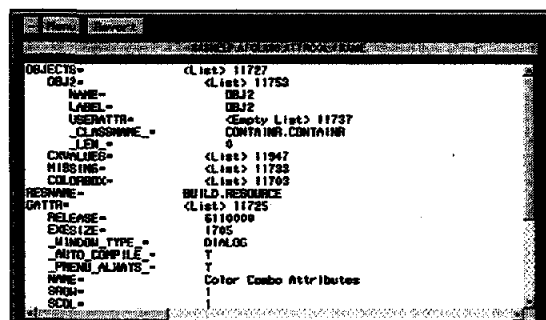


Figure 3 (The Widget Descriptions)

SASHELP.AFCLASS.ATTRCOL.FRAME Tuesday, April 15, 1997 6:24 PM										
OBJECT	DESC	PARENT	ROW	COL	LEN	BOX	CLASS	TEXT	TYPE	
OBJ2	Container Box		2.5	4.5	29.0	2.5	CONTAINER.C	CONTAINER		Options
CRYSTALS	Check Box	OBJ2	0.0	0.0	29.0	2.0	CHECKBOX.C	CHECKBOX	Allow SAS/GRAPH colors	
MISSING	Check Box	OBJ2	2.0	0.0	29.0	1.0	CHECKBOX.C	CHECKBOX	Allow missing values	
COLORBOX	List Box		6.0	3.0	32.0	14.0	LISTBOX.L	LISTBOX	Additional Colors	

and Figure 4 (The Frame's List)



Viewing And Printing Catalog Entries

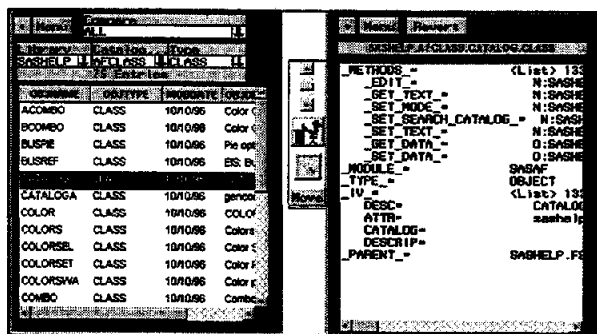
In addition to the FRAME entries, virtually all other catalog entry types may be viewed and/or documented in a similar manner. List-based entries (SLIST, LIST, CLASS, etc.) can be viewed and sublists expanded and collapsed in the CATALOGER windows simply by clicking on the name of the sublist. SAS formats are displayed in an easy-to-read data table. Other entry types such as DEV, KEY, FORM (all pages at once), PMENU and TOOLBAR are also easily viewed by point & click. FONT entries are shown with sample text in the selected font. GRSEG and IMAGE entries (both SAS catalog image entries or external file images) can be viewed through CATALOGER windows. Even special types like ASCII and VIDEO (AVI) can be easily displayed. Also, any entry that is viewed may be printed, and saved as an external file, including as a Microsoft Word® document. All examples in this paper, with the exception of the SCL entries, will be SASHELP catalog entries.

To view or print a catalog entry, for example a FRAME entry, select the library and catalog in which the entry exists by single-clicking on the down arrow control object next to the LIBRARY and CATALOG input fields. Single-click on its name in the window, and a popmenu appears that allows the selection of the frame image, widget descriptions, SCL, or frame image as it appears in Build mode. Selecting one of these options causes the entry to be displayed in the same window which formerly displayed the list of catalog entries. Clicking on the "Revert" buttons re-displays the lists of catalog entries.

Viewing And Printing Lists And Sublists

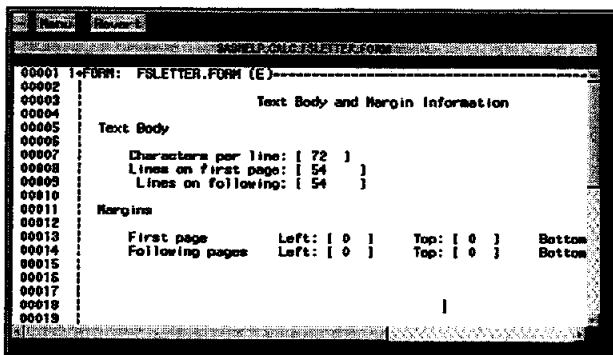
Sublists within a list can be easily viewed by clicking on a list item in the window, for example a CLASS entry. The sublists are noted by the designation "<List>" appearing to the right of the list entry. Click on the <List> and the sublist contents are displayed, properly indented. Click on the <List> again, and the sublist is collapsed.

Figure 5



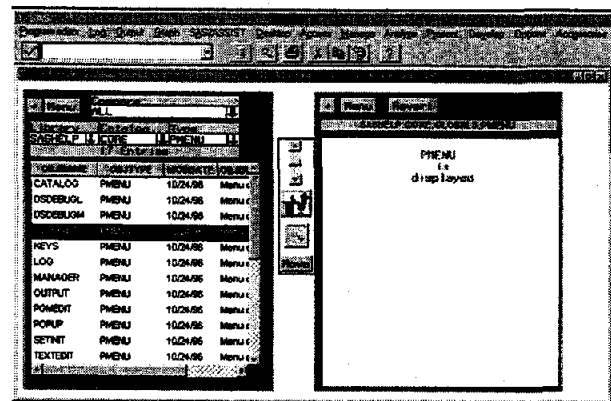
Key definitions can be viewed and printed in exactly the same way. Other entry types that may be viewed and/or printed include device definitions (DEV) and FORM. For FORM entries, all pages of the FORM definition are included in the scrollable window, and any window can be quickly zoomed to view more of the entry, simply simply by clicking on the , and then restored by clicking on the .

Figure 6



When FONT entries are selected in a CATALOGER window, sample text is displayed using the selected font. Similarly, when a PMENU or TOOLBAR entry is selected, the Application Workspace (AWS) changes to display the selected entry. In the next example, the PMENU entry SASHELP.CORE.GLOBAL.PMENU is selected and CATALOGER displays it as it would appear in an application frame.

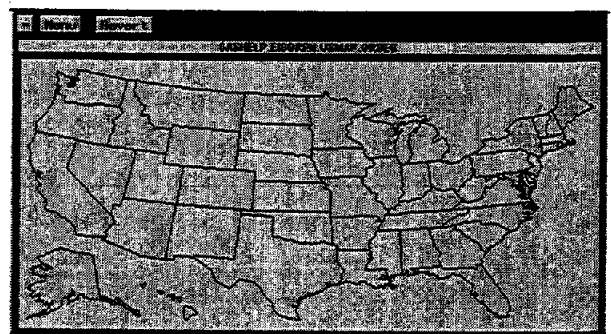
Figure 7



TOOLBAR entries behave in much the same manner, and when a TOOLBAR entry is selected, it will also change the AWS to display the selected entry. Both the TOOLBAR and the PMENU are active in the CATALOGER windows, and will attempt to execute any commands associated with the selection of an item in the PMENU structure or icon in the TOOLBAR.

Graphical entries such as GRSEG and IMAGE entries (both SAS catalog images and external file images) can also be displayed in CATALOGER windows. If an entry type of IMAGE is selected, a popup menu appears which allows the selection of viewing either a SAS catalog image or an external file image. The next figure is the entry SASHELP.EIS.USREGION.GRSEG displayed in a zoomed CATALOGER window, any image entry could be similarly displayed.

Figure 8



Viewing And Printing Special Types Of Catalog Entries

Video files (AVI) can also be played in a CATALOGER window. When the TYPE field is VIDEO, a dialog box is presented to allow selection of

the video file to play. The first frame of the video clip is displayed in the window, and control of the viewing is allowed in two ways. If the PLAY button is selected, the video will play in it's entirety at it's regular speed. Frame by frame control, for both forward and reverse, is handled by the vertical scroll bar between the two CATALOGER windows. The top arrow reverses the sequencing of the video, while the lower arrow steps forward through the video.

Viewing And Printing ASCII Entries

Viewing and printing ASCII files is accomplished in the much the same way that video files are handled. When the TYPE field in the CATALOGER window is changed to ASCII, (either manually or by selecting ASCII from the selection list), a dialog box is presented to allow selection of the ASCII file to be placed in the CATALOGER window. Once in the window, the entry may be scrolled, viewed, printed, or saved to a Microsoft Word® document, just like any other catalog entry.

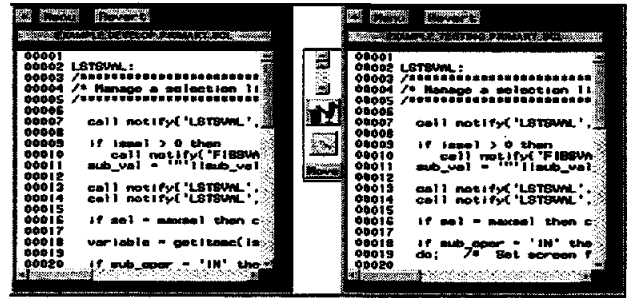
Synchronous Scrolling

The two CATALOGER windows can be scrolled simultaneously by clicking on the scroll bar in between the two windows. All text based entries and video (AVI) entries can be scrolled this way. Therefore, a catalog entry that appears in two catalogs (i.e. DEVELOP and TESTING) can be viewed simultaneously, making it much easier to identify where differences occur between versions of the entry. For example, assume two catalogs, DEVELOP and TESTING contain an SCL entry named PRIMARY. Assume also that the following code was added to DEVELOP.PRIMARY but not to TESTING.PRIMARY:

```
variable = getitemc(lsidmain,3);
```

The two windows might then look like:

Figure 9



Pressing the lower arrow on the scroll bar would cause the text in both entries to scroll upward in the windows. By carefully watching the two windows, we would notice that when line 18 was placed at the top, there would be a difference in the two. EXAMPLE.DEVELOP.PRIMARY.SCL had the new line of code. Pressing the upper arrow scrolls the code down the window, so that earlier lines may be viewed. Scrolling can be made automatic by selecting the

Automated Synchronous Scrolling icon,  found in between the two default windows. Selecting this icon will automatically scroll the two windows, leaving the user free to concentrate on the contents of the windows.

Comparing Catalogs and Frame Entries

One of the most powerful features of this application is the compare facility. Basically, there are two ways to compare catalogs. First, to determine entries that are in one but not the other. Second, to compare like-named frame entries that are different. To determine differences between catalogs, select Mutually Exclusive from the popmenu presented for the COMPARE field. Each window will then contain the entries that are not in the other catalog. For example, assume all but 11 of the entries in SASHELP.ADE are copied to CATALOGR.ADE, and that one new frame is added to CATALOGR.ADE. A Mutually Exclusive comparison would result in:

NAME	CLASS	MODIFY	MODIFY
RESENTRY	CLASS	10/10/96	RESE
SCHENTRY	CLASS	10/10/96	AOE C
SCHENTF	CLASS	10/10/96	AOE E
PRVSET1	DATAFORM	10/10/96	PRVS
ADNMMAI	FRAME	10/10/96	ADNM
ADNMMOD	FRAME	10/10/96	Modfy
ADNMENB	FRAME	10/10/96	Crete
SCHENBU	PMENU	10/10/96	stnde
ADNMMAI	SQL	10/10/96	ADNM
ADNMMOD	SQL	10/10/96	GRPL
ADNMENB	SQL	10/10/96	ADNM

Same-named frame entries in two catalogs can be compared to determine how they are different. The details that can be compared are: Number of Widgets, Name of the SCL entry, Compile Size, Resource Entry used, and the Modified Date. To perform the comparison, click on the COMPARE icon, (the magnifying glass icon above the Move button). The Frame Comparison window is then presented. In this window, all frame entries from both catalogs are listed alphabetically, and are marked where differences exist.

☐ Any Difference	☐ Dif. Compile Size
☐ Dif. # of Widgets	☐ Dif. RESOURCE name
☐ Dif. SQL source entry	☐ Dif. modified dates

☒ Normal

SQL Entry List

JOBNAME	JOBTYPE	SERIAL	SERMSG	SERSQL	UP-CONF	TYPES	DIFNOTES
ADMINONE	FRAME	1	0	0	0	0	1
ADMINTMP	FRAME	1	0	0	0	0	1
ADMINTOP	FRAME	1	1	0	1	0	1
ADMINWV	FRAME	1	0	0	0	0	1
ARCHLM	FRAME	1	0	0	0	0	1
CHANGE	FRAME	1	0	0	0	0	1
CLASSSD	FRAME	1	0	0	0	0	1
CONFRM	FRAME	1	0	0	0	0	1
CONFMSG	FRAME	1	0	0	0	0	1
COPIES	FRAME	1	0	0	0	0	1
DUPERUN	FRAME	1	0	0	0	0	1

Comparing SAS Datasets

SAS datasets that reside in two or more libraries may be compared in exactly the same manner catalogs are compared. Datasets that reside in one library but not the other can be identified, and same name datasets can be compared for Number of Observations, Number of Variables, Number of Deleted Observations, BUFSIZE, Index types, PROTECT, COMPRESS, REUSE, and Date/Time values.

Any two text-based entries can be compared line-for-line. Examples of the types of text entries that can be compared are: SCL, SOURCE, CBT, LOG, OUTPUT, SLIST, LIST, CLASS, EIS, RESOURCE, FOLDER, and ASCII files. To start the comparison, select one entry from each of the windows. Next, click on the COMPARE icon. The Text Comparison window then presents with the two entries in side by side windows. Clicking on the Compare button at the bottom right performs the comparison and the first occurrence of a difference in both files is highlighted.

```

BASEFILE.AGE.AUDATA.SOURCE
00001 /*Create test data for SEN */
00002 /*Change*/
00003 Xlet sen libname;
00004 Xlet sen obj=Xset(logical sen
00005 Xlet subset=Xset(if _n(i);
00006 data &senlib..srcname=label
00007 /*Entry for each object in a
00008 individual entries are not
00009 /*Each object type has a defo
00010 /*Basename - non-changeable po
00011 the libref. for external f
00012 /*do we need program here? A
00013 /*I don't know, ask the mod
00014 moddate moddate int;
00015 format moddate moddate datest
00016 format logical sen entry t
00017 label logical "Source Libref
00018 member="Source Library
00019 entry="Source Catalogue"
00020

CATALOGUE.AGE.AUDATA.SOURCE
00001 /*Create test data for SEN */
00002 /*Change*/
00003 Xlet sen libname;
00004 Xlet sen obj=Xset(logical sen
00005 Xlet subset=Xset(if _n(i);
00006 data &senlib..srcname=label
00007 /*Entry for each object in a
00008 individual entries are not
00009 /*Each object type has a defo
00010 /*Basename - non-changeable po
00011 the libref. for external f
00012 /*do we need program here? A
00013 /*I don't know, ask the mod
00014 length logical member entry t
00015 format logical sen entry t
00016 format moddate moddate datest
00017 format logical member entry t
00018 label logical "Source Libref
00019 member="Source Library
00020

```

Finding A Text String

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prompt for the string to search and the types of entries to search. When the search is completed, a data table is populated with the entry name, line number, and text where the string was found. Clicking on the row will open then entry listed on the row and place the line containing the string at the top of the window.

Conclusion

Cataloger is a SAS/AF application written to greatly simplify the task of SAS/AF application development by automating the tasks of documentation and code management. The batch printing facility, compare facility, and search facility make CATALOGER an invaluable tool for the development and maintenance of SAS/AF applications and SAS datasets.

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