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Saving Typing with SAS® Editor Abbreviations

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ABSTRACT

Accelerating analysis and faster data interpretation helps to stay competitive in the drug development field. It requires statistical programmers to identify fast and efficient ways to deliver analysis results in a timely manner.

Imagine you're at your computer working on an urgent task. You need to write code for a SAS procedure but you don't remember the syntax completely. It's time-consuming to search the SAS manuals or the SAS Help website to look up the syntax, trial and error coding, and tedious typing. In such situation SAS® Abbreviations are an easy, quick and efficient way to reduce programming time. With just a few typing, the proper syntax is inserted automatically into your SAS program. Abbreviations can also be shared with other SAS programmers for additional efficiencies.

This paper will introduce how to create abbreviations in SAS® Enhanced Editor and provide some useful examples of abbreviations in our daily work.

INTRODUCTION

In addition to the traditional regular reporting, exploratory analysis now plays an increasingly more important role in clinical trials to support biostatistician and clinical scientist to understand study data more intimately, in order to make fast decision. To support fast data exploration, you probably prefer to go about SAS programming utilizing your favorite functions of the SAS Enhanced Editor. However, there are situations that you may not remember the whole syntax of a SAS procedure, and it's time consuming to search the SAS manuals or the SAS Help website to look up the syntax, trial and error coding and tedious typing. In such situation SAS® Abbreviations are an easy, quick and efficient way to reduce programming time. With just a few typing, the proper syntax is inserted automatically into your SAS program. Thus, it enables statistical programmers to spend less time writing programs and deliver analysis results in a flexible and effective way.

This paper outlines how to build and call SAS abbreviations with some real examples. By reading this paper you will enhance your knowledge of the SAS Abbreviations and learn new features to incorporate into your day to day SAS programming.

HOW TO BUILD AN ABBREVIATION?

SAS® abbreviations are macros that you can create with the SAS Enhanced Editor in the Windows operating environment. It allows you to recall stored code with a minimum of keystrokes. By creating abbreviations, you can save yourself significant time in typing. And abbreviation enables you to associate short key letters with tedious text, which is useful to eliminate repetitive typing or to remind you of complex syntax.

To build an abbreviation, select the pull down menus Tools and Add Abbreviation (or hold the Shift + Ctrl + A keys). This will brings up the Add Abbreviation window. As an example, assume that you want to build a simple abbreviation for the transpose procedure so that you don't have to type the whole syntax each time.

In the Add Abbreviation window, enter a name for the new abbreviation in the "Abbreviation:" field. In this example we use "proc transpose" as the abbreviation name. Then enter the syntax of transpose procedure in the "Text to insert for abbreviation:" field. It's recommended to copy the text from your reference programs or SAS help directly. Press the OK button then the new abbreviation will be created.

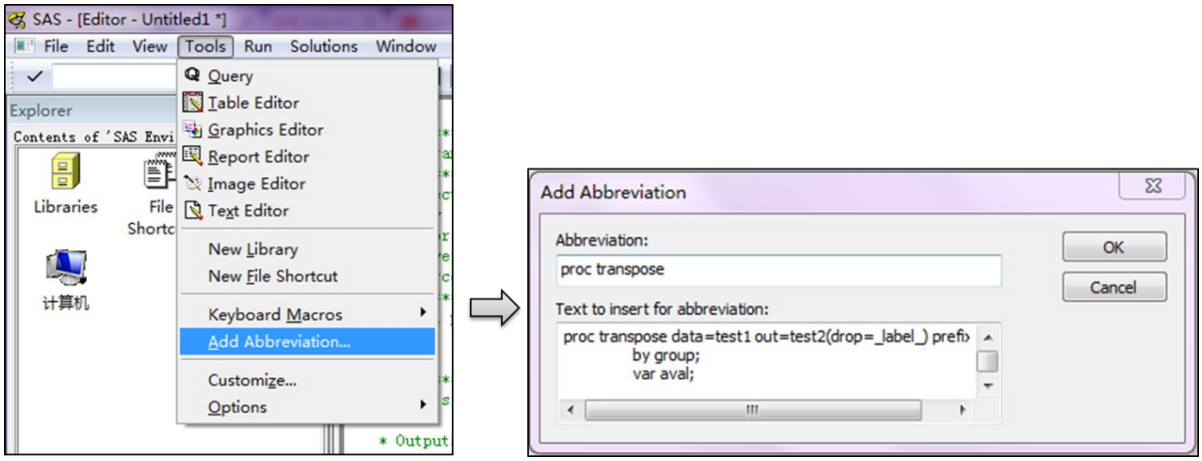


Figure 1 Build an abbreviation in SAS Enhanced Editor

HOW TO CALL AN ABBREVIATION?

Once an abbreviation has been created, you can invoke it whenever you type the abbreviation in the program window. The editor displays a small box that shows the first several characters of the saved abbreviation. By pressing the tab or enter key, the contents of that abbreviation will automatically appear. Any other keyboard selection will reject the abbreviation.

In our case the “proc transpose” abbreviation is invoked as shown below:

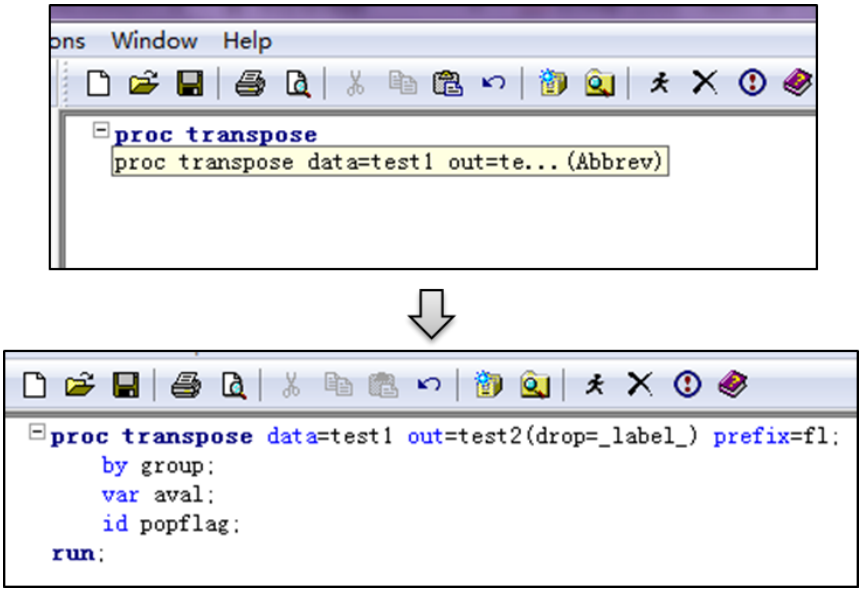


Figure 2 Invoke an abbreviation for the transpose procedure

In this case, you can easily modify the inserted code, without typing the whole syntax in the enhanced editor window. Note that the abbreviation name is case sensitive, this means that you must enter the abbreviation name exactly the same as your defined name.

APPLICATION SHOWCASE

The SAS abbreviations are quite effective and useful in our daily work. It is necessary that we make use of our programming tools to maximize our productivity. Here I will share some examples of how I have found them to be useful.

APPLICATION 1 – CREATING STANDARD PROGRAM HEADERS

Standard program headers are commonly used by statistical programmers, to illustrate the program-specific information such as author name, date, project name, etc.

Creating an abbreviation which contains the text of the standard header is a perfect application for abbreviations. Having such a standard header has turned out to be extremely useful in many ways.

We use the following lines of code as our standard program header:

```
/*************************************************************************
* program_name.sas
*************************************************************************
* Project :The project name
* Study : The study name
* Author : Author name
* SAS version : Version Number
* $Source: The program path
*************************************************************************
* (full program description)
*************************************************************************
* Inputs :
*
* Outputs :
*
* Called macros :
*************************************************************************/
```

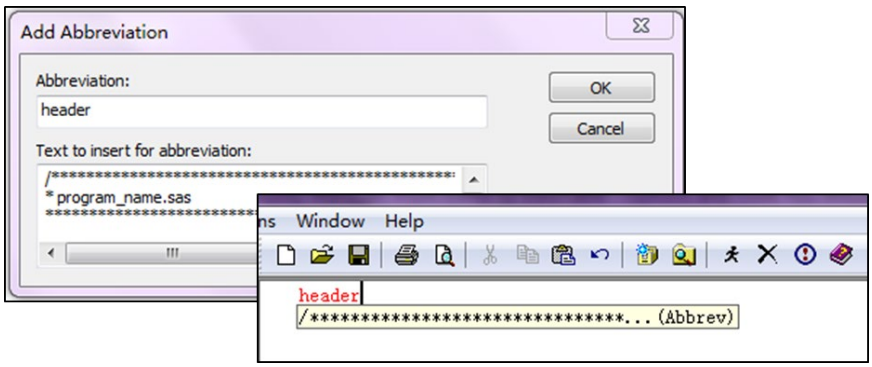


Figure 3 shows that the name of the "header" abbreviation has been created and a pop-up box will show up when you enter "header" in the Enhanced Editor. By pressing the TAB or ENTER key, the whole header comments will be inserted and you can just fill in your program information.

Figure 3 Create abbreviation "header" for standard program headers

APPLICATION 2 CREATING TEMPLATE CODE FOR COMMONLY USED GRAPHS

Graphics are a powerful way to display clinical trial data. In SAS 9.2, the ODS Graphics Template Language becomes available. Programmers then have the opportunity to modify procedure output and use GTL to produce graphs of their own design. However, on the other side, when writing a new GTL program for simple graph, you have to type long and complex codes. To create a simple mean plot, you have to type in the following program:

```
proc template;
  define statgrap mean_plot;
        begingraph;
          entrytitle'Mean Change from Baseline of Laboratory Data by Treatment';
                layout overlay /yaxisopts=(label='Mean Change' griddisplay=on)
                               xaxisopts=(display=(ticks tickvalues));
                 scatterplot x=visitn y=chg / group=arm
                                              yerrorlower=lower yerrorupper=upper
                                              markerattrs=(color=black )
                                              name="ci";;
                  seriesplot  x=visitn y=chg / group=arm
                                              lineattrs=(pattern=solid)
                                              lineattrs=(thickness=2) name='ci';
                                             discretelegend 'ci' / title='Treatment:';
                endlayout;
        endgraph;
  end;
run;
```

```
ods listing;
ods graphics / reset width=5in height=3in imagename='mean_plot';
proc sgrender data=lb template=mean_plot;
run;
```

As you can see above, only a few lines of code need unique settings to create a mean plot. SAS abbreviations provide a solution for this situation. As shown in figure 4, an abbreviation "mean_plot" was created for the above code. Instead of writing 22 lines of code or copying the syntax from the old program, it's more convenient to call the abbreviation to insert the code needed, then do little modification such as change the title, dataset name and the settings of xaxis and yaxis, and I'm done.

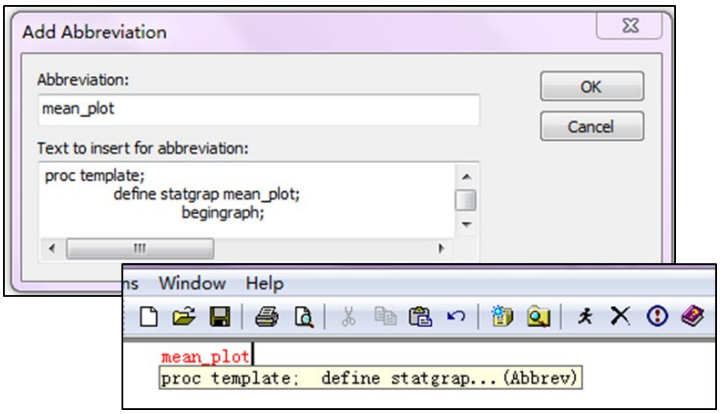


Figure 4 Create abbreviation "mean_plot"

APPLICATION 3 CREATING TABLES/LISTINGS WITH THE HELP OF ABBREVIATIONS

In addition to graphs, tables and listings are also frequently used by statistical programmers to support data review or provide summarized information. PROC REPORT is a most popular procedure that allows a programmer to do various things like lists, statistics, and computations all within one procedure. Since I have created so many tables and listings, and I am using the same program over and over again. It's possible to create an abbreviation for the report procedure, and highlight those places in the program where need to be modified, e.g. column label, file path etc.

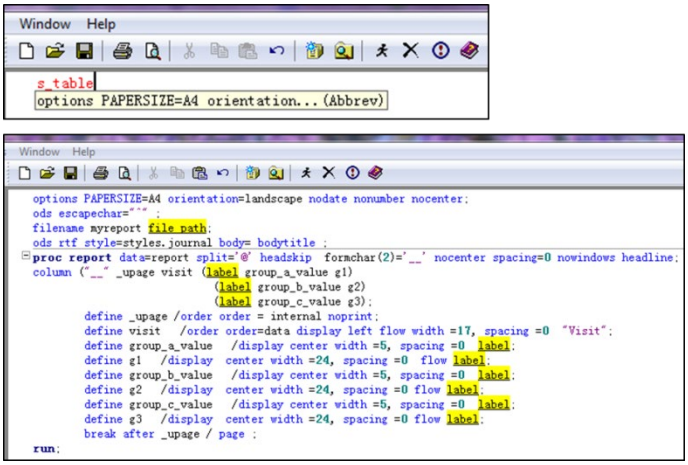


Figure 5 Create abbreviation "s_table"

This can be done by assigning the user defined keywords through the Enhanced Editor Options window. Simply select Tools -> Options -> Enhanced Editor, define keywords you want to highlight in the "General" tab and set display colors in the "Appearance" tab. As shown in Figure 6.

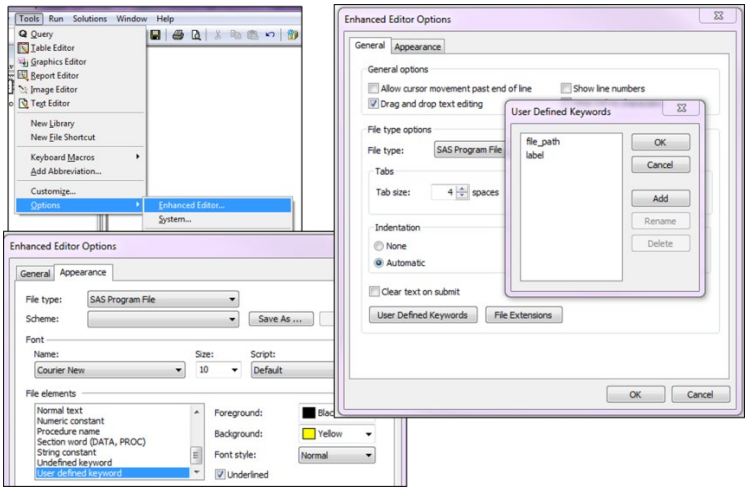


Figure 6 Highlight user defined keywords

MANAGING SAS ABBREVIATIONS

Edit/Rename/Delete an Abbreviation

Editing or deleting your abbreviations once they have been created is also possible. You can make changes to your created abbreviations from the Tools menu. Select Tools -> Keyboard Macros -> Macros, this will bring up a Keyboard Macros dialog box. As shown in figure 7.

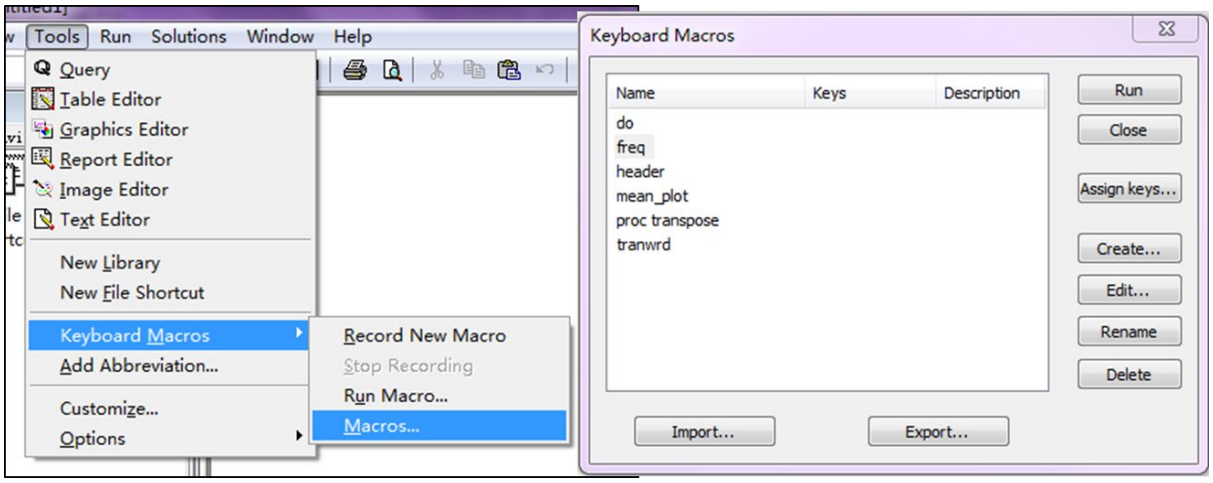


Figure 7 Edit/Rename/Delete an Abbreviation

From this dialog box you can edit, rename or delete your defined abbreviations by choosing the corresponding buttons.

Creating Shortcut Keys

In addition, the Enhanced Editor provided the flexibility for the programmers to define their own keyboard shortcut keys for the abbreviations. By assigning a keyboard shortcut you can significantly reduce the time to perform repetitious sequences of keystrokes. Using the Assign Keys window you can easily create a keyboard shortcut for your abbreviations. Figure 8 below shows the shortcut key CNTL + T has been assigned to the “proc transpose” abbreviation. Then it's possible to call the “proc transpose” abbreviation by either typing the defined abbreviation name or by pressing the short cut key CNTL + T.

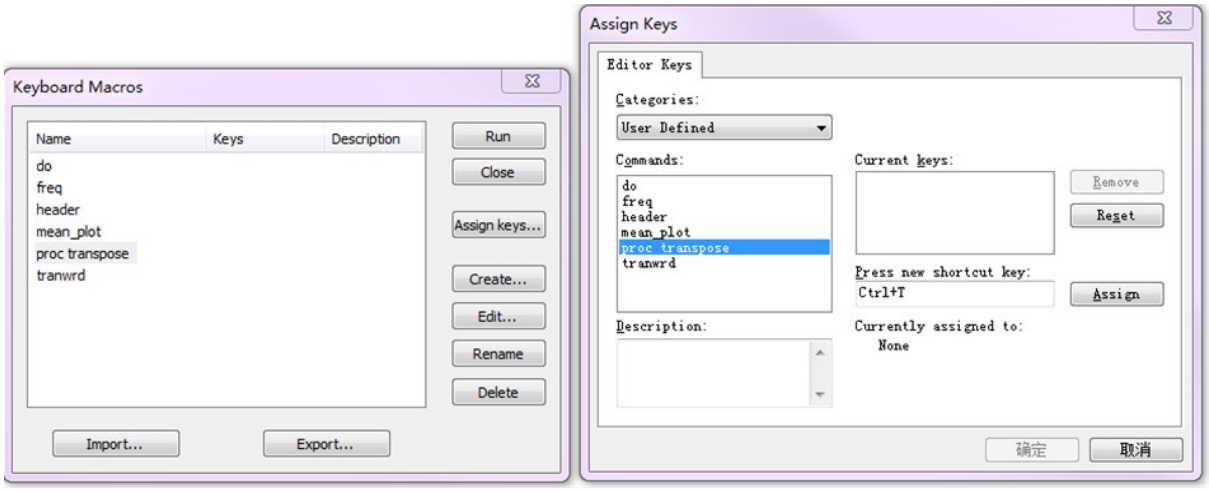


Figure 8 Assign short cut key “Ctrl+T” to “proc transpose” Abbreviation

Use caution when assigning the short cut keys to not use just one word such as ‘T’, as every time you type this word in the enhanced editor the abbreviation box will be invoked. SAS editor will notify you if you name the short cut key the same name as a system key.

Importing/Exporting Abbreviations

Once created abbreviations can be shared with others by importing or exporting the defined abbreviations. Use the Export button to create a file with .kmf extension, then this file can be imported by other colleagues. In the Keyboard Macros window click on Import button, navigate to your file, select the .kmf file and click OK. Then it's done.

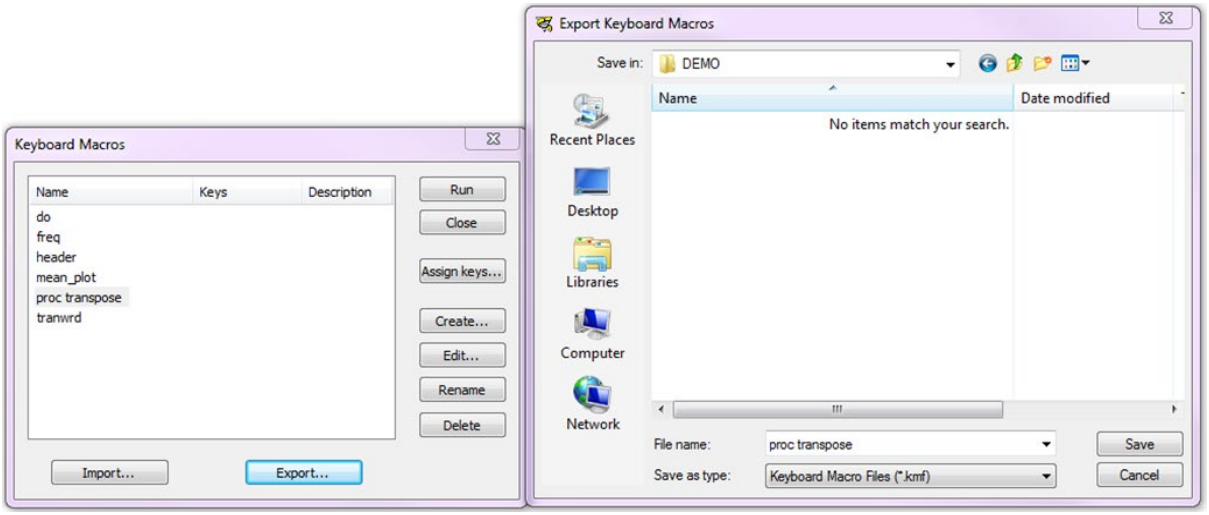


Figure 9 Export "proc transpose" abbreviation to .kmf file

It should be mentioned that the short cut keys for abbreviations cannot be exported in order to avoid overwriting any existing keys; this meansyou have to reassign the keys after importing. Moreover, there's a limit on the number of abbreviations that can be imported into SAS. You can only have 401 abbreviations on your SAS system.

CONCLUSION

This paper describes the capability of SAS abbreviations and provides some real application examples in our daily work. SAS Abbreviations are an efficient way to implement SAS code for you and help maximize our productivity. It is hoped that this paper provides the framework for further use and will help statistical programmers deliver analysis results in a timely manner to support team's fast decision.

REFERENCES

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