The Autocall Macro Facility in the SAS for Windows Environment

Karl Jensen, Magellan Health Services, Sandy, UT
Matt Greathouse, Magellan Health Services, Sandy, UT

ABSTRACT

The autocall macro facility allows users to access the same macro code from multiple SAS® programs. Rather than have the same macro code in each program where the code is required, with an autocall macro the code is in one location, which permits faster updates and better consistency across all programs. This paper will briefly discuss using the SAS autocall macro facility in the Microsoft Windows environment.

HOW AUTOCALL MACRO FACILITY WORKS

Macro Set-up

The first step is to set up a SAS program that contains the macro desired to be used in multiple programs. Although the program may contain other macros and/or open code, it is advised to include only one macro. This macro must be named the same as the name of the file (e.g., %HMOMAP1 and HMOMAP1.SAS). For example, the file named HMOMAP1.SAS may contain the following code:

```
%Macro Hmomap1;
Data Hmomap;
   Set IPCare;
   If Hmo = 1 then Name = 'Utah';
   Else if Hmo = 2 then Name = 'California';
   Else if Hmo = 3 then Name = 'Nevada';
   Else if Hmo = 4 then Name = 'Arizona';
%Mend Hmomap1;
```

This macro would create a new dataset called HMOMAP containing everything in the old dataset (IPCare) with the addition of the variable NAME. Be sure that the dataset being modified does not contain a variable called NAME or it will be re-assigned a new value and/or may result in variable type errors.

Since each user may define the variables differently, parameters can be passed to the autocall macro in the same manner as a standard macro. For example, instead of calling the variable HMO, one calls it HMOPLAN and the dataset is based on outpatient data (OPCare) rather than inpatient data (IPCare). The macro could be changed to account for this with the following code:

```
%Macro Hmomap2(Hmo=,dataset=);
Data Hmomap;
   Set &dataset;
   If &Hmo = 1 then Name = 'Utah';
   Else if &Hmo = 2 then Name = 'California';
   Else if &Hmo = 3 then Name = 'Nevada';
   Else if &Hmo = 4 then Name = 'Arizona';
%Mend Hmomap2;
```

This macro would create macro variables HMO and DATASET that are set during the invocation of the macro. The macro would resolve as follows:

```
Data Hmomap;
   Set OPCare;
   If Hmoplan = 1 then Name = 'Utah';
   Else if Hmoplan = 2 then Name = 'California';
   Else if Hmoplan = 3 then Name = 'Nevada';
   Else if Hmoplan = 4 then Name = 'Arizona';
```

Set MAUTOSOURCE and SASAUTOS

Before one can use the autocall macro within the SAS program, the MAUTOSOURCE option must be set and the SASAUTOS option assigned. The MAUTOSOURCE option indicates to SAS that the autocall facility is to be activated. The SASAUTOS option tells SAS where to look for the macro(s). For example, the option statement may look something like

```
Options Mautosource Sasautos='g:\busmeas\internal\macro\';
```

It is suggested to save all autocall macros in the same directory. This allows for easy maintenance of the macros as well as avoiding confusion between regular SAS programs and autocall macros. However, SAS does allow you to direct it to multiple directories. The following syntax is an example of how this could be accomplished.

```
Options Mautosource
        Sasautos=('g:\busmeas\','k:\finance\','c:\product\');
```

Using the Autocall Macro

Once the SASAUTOS and MAUTOSOURCE options are set, the autocall macro is called in exactly the same way as any other macro. Executing the code in the first example above is as simple as

```
%Hmomap1
```

When passing parameters, the code is modified to include the names of the parameters within the macro call. As many parameters can be added as necessary by separating each parameter with a comma. The second macro is called with the following code:

```
%Hmomap2(Hmo=Hmoplan,Dataset=OPCare)
```

When the macro is called in the SAS program, SAS first looks for a compiled macro by the submitted name within the current session. If it does not find one, SAS then looks for a permanently stored macro with the submitted name. If SAS still does not find the macro, SAS looks in the directory specified by the SASAUTOS option. When it finds the file with the same name as the macro specified, the code within the SAS file is compiled. After the file is compiled, SAS then executes the macro.

CONCLUSION: THINGS TO REMEMBER

While the use of the autocall macro facility is fairly simple, it is important to remember a couple things. First, the naming of the macro file and that of the macro itself must be the same. If the name of the program is different from the macro you submit, SAS will not find the file in the SASAUTOS directory and therefore never find the macro to compile.

Second, while you can put open code and/or other macros within the macro file, it is sometimes confusing to the end user to do so. Open code will only execute the first time the macro is compiled rather than each time the macro is called. Additionally, other macros within the autocall macro will compile, but it may not be inherently apparent to the end user that they are available.

Last, it is possible that you will need to change the autocall macro code while it is in use. It is important to remember that the macro is compiled only the first time it is called within a SAS session. After that SAS will use the code that has already been compiled. If changes are made to the macro, it must be compiled again before the changes go into effect.

References

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SAS Institute Inc. (1997), *SAS Macro Language: Reference, First Edition*, Cary, NC: SAS Institute Inc.

Acknowledgments

Thanks to Nancy Tippetts, Julie Thomas and Brent Heaton for their help in reviewing this paper.

Contact Information

Matt Greathouse
Magellan Health Services
P.O. Box 57986
Salt Lake City, UT 84157-0986
Greathom@Cougar.Netutah.Net

Karl L. Jensen
Magellan Health Services
P.O. Box 57986
Salt Lake City, UT 84157-0986
Karljens@Hotmail.Com