

Three Methods to Dynamically Assign Colors to Plots Based on Group Value

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ABSTRACT

Specifying colors based on group value is a quite popular practice in visualizing data, but it is not so easy to do, especially when there are multiple group values. This paper explores three different methods to dynamically assign colors to plots based on their group values. They are combining EVAL and IFN functions in the plot statements, bringing DISCRETEATTRMAP block into the plot statements, and utilizing the macro from the SAS sample 40255.

INTRODUCTION

When visualizing data, how to dynamically assign colors to each plot based on its group value is a challenge, especially when there are multiple group values. It is necessary to use multiple coloring methods to draw a figure consisting of different types of plots. This paper will focus on three ways to color each plot based on its group values using SAS Graph Template Language (PROC TEMPALTE).

All programs presented in this paper were developed on Server SAS® 9.3 in the Windows environment.

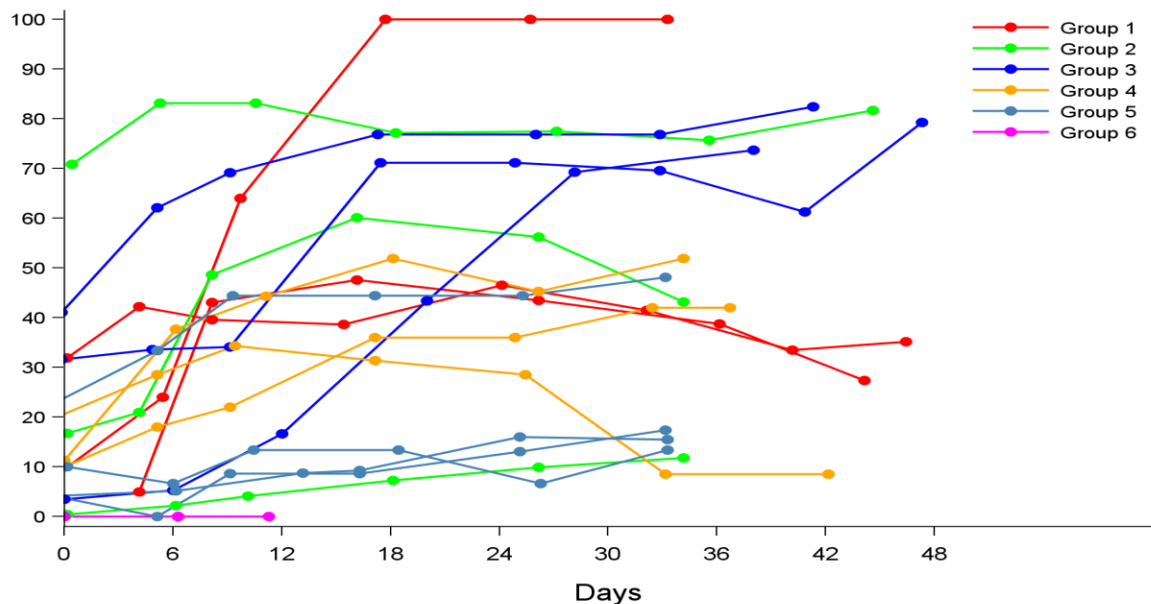
1. USE EVAL AND IFN FUNCTIONS

The simplest way to dynamically assign colors to a plot is to combine the EVAL and IFN functions in the plot statements. For example, the following SERIESPLOT statements assign different colors to each subject (variable SUBJID) based on their group value (variable GRP) such as 1, 2 and 3. X_Value and Y_Value are for the X axis and the Y axis, respectively.

```
SERIESPLOT X = X_Value Y = EVAL(IFN(GRP=1, Y_Value, .)) / GROUP = subjid
              DISPLAY= ALL LINEATTRS = (PATTERN = SOLID COLOR= RED )
              MARKERATTRS = (SYMBOL = CIRCLEFIELD COLOR= RED );
```

```
SERIESPLOT X = X_Value Y = EVAL(IFN(GRP=3, Y_Value, .)) / GROUP = subjid
              DISPLAY= ALL LINEATTRS = (PATTERN = SOLID COLOR= BLUE )
              MARKERATTRS = (SYMBOL = CIRCLEFIELD COLOR= BLUE );
```

The output looks like this:



If there are only a few of groups, this is a really easy method. However, repeating plot statements for different groups is not efficient when there are many groups.

2. USE DISCRETEATTRMAP STATEMENT

DISCRETEATTRMAP block builds associations between graphical properties and a data input column. The following BARCHART statement and the “colors” DISCRETEATTRMAP are able to map colors to each plot based on their group value such as “a” and “b” here. Furthermore, it will increase programming efficiency and flexibility if macro variables are created to dynamically store discrete data values “a” and “b”.

```
DISCRETEATTRMAP NAME = "colors" / IGNORECASE = TRUE ;
    VALUE "a" / FILLATTRS = GRAPHDATA1 (COLOR= RED2);
    VALUE "b" / FILLATTRS = GRAPHDATA2 (COLOR= GREEN3);
...
ENDDISCRETEATTRMAP;

DISCRETEATTRVAR ATTRVAR = groupcolors VAR = subjid ATTRMAP = "colors" ;

BARCHART X = X_Value Y = Y_Value / GROUP = groupcolors DISPLAY = ALL ;
```

3. UTILIZE THE MACRO FROM SAS SAMPLE 40255^[1]

Sample 40255 generates a spaghetti plot of study results by treatment group. With some minor modifications, we can apply this macro to other types of plots. For example, the key part of the macro is the CALL SYMPUT statement:

```
CALL SYMPUT('gd'||TRIM(LEFT(count)), 'STYLE '|| ' GRAPHDATA ' ||
    TRIM(LEFT(count)) || ' FROM GRAPHDATA' ||
    TRIM(LEFT(count)) || ' / CONTRASTCOLOR=' ||
    TRIM(LEFT(color)) || ' LINESTYLE=1;');
```

The STYLE statement can be changed to a CLASS statement as follows:

```
CALL SYMPUT('gd'||TRIM(LEFT(count)), 'CALSS GRAPHDATA ' ||
    TRIM(LEFT(count)) || ' / CONTRASTCOLOR=' ||
    TRIM(LEFT(color)) || ' LINESTYLE=1;');
```

or the CONTRASTCOLOR statement can be changed to to a COLOR statement depending on the actual needs:

```
CALL SYMPUT('gd'||TRIM(LEFT(count)), 'CALSS GRAPHDATA ' ||
    TRIM(LEFT(count)) || ' / COLOR=' ||
    TRIM(LEFT(color)) || ' LINESTYLE=1;');
```

This method is very useful when the plots have many different groups.

CONCLUSION

Having multiple solutions to a task provides flexibility and efficiency to programming work. When assigning colors to complex plots with multiple group values using one or a combination of the above three methods will help achieve your goal.

REFERENCES

[1]. <http://support.sas.com/kb/40/255.html>

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