

VIEWS

International SAS Programmer Community



News, Hints, Tips and Information for SAS® Users

Issue 57, 3rd Quarter 2019

This will be the 2nd issue in 2019, and the SAS world is changing, but still retaining its roots in Base SAS programming at the same time. This newsletter issue contains an article from LeRoy Bessler about ODS Graphics, a video demo from Allan Bowe about SAS-connected web apps, and a Base SAS macros article from myself. I have included some SAS-related events publicised for the next few months too. I've also added some more formats, options and functions that you may not have come across before, but you might find interesting, and even useful.

If you would like to contribute an article, to re-visit and improve an existing article, or just discuss the possibility of doing so, please feel free to send an email to me at views-uk@hollandnumerics.org.uk.

Philip R Holland (Newsletter Editor)

Membership of VIEWS is **free** and you can register for notification of all future VIEWS News issues by registering at blog.hollandnumerics.org.uk, and then emailing views-uk@hollandnumerics.org.uk, or using the blog site menu, to request access to the VIEWS UK forum. Members will receive an email notification whenever a new issue of the free quarterly VIEWS News is published on the web site, please inform us when you change your email address, otherwise your registration may be cancelled.

Did You Know?

If you have a useful hint or tip, please send it to the Editor, and share it with the VIEWS membership.

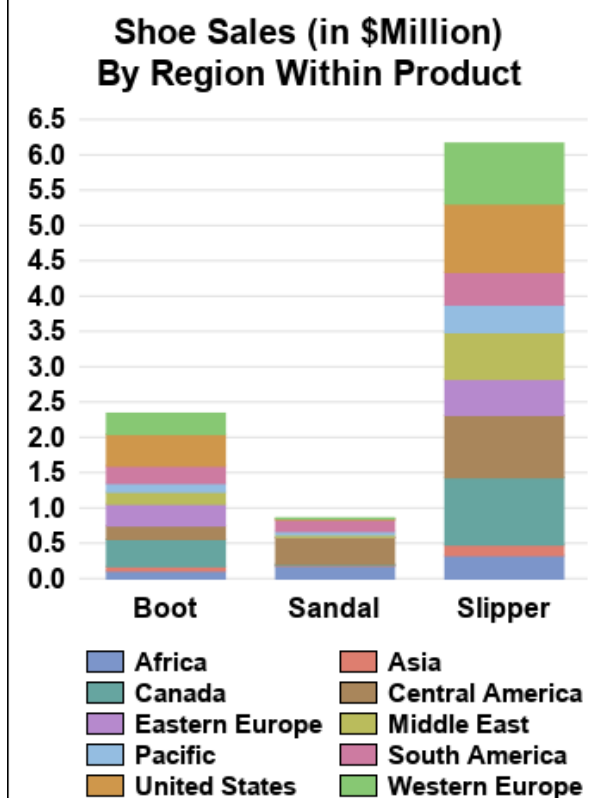
The Stacked Bar Chart Revisited Using ODS Graphics

In VIEWS News Issue 38, 2nd Quarter 2007, my article "Better than a Stacked Bar Chart" presented a SAS/GRAPH alternative that used a side-by-side vertical bar chart that included a Total bar for each category, for which data was obtained by preprocessing the input. The chart included values at the top of each bar, assuring that viewers got both a visual and precise numbers. Reliable communication requires both the visual for easy, quick inference, and precise numbers for reliable, accurate inference. For a side by side bar chart with a total bar for each category, the total count of bars can get large. In that case, it can become impossible to fit the annotations.

With ODS Graphics, the XAXISTABLE feature plus a trick to deliver the category totals provides a better solution.

The example here uses the data set SASHELP.SHOES. It is presented two ways, one with only three of eight products which fits well in this narrow column, and the other with all products to show what that looks like, even if the image is not really readable. The code for the two cases is really the same, except use or non-use of a filter, image width, and image name.

But let's first look at a traditional Stacked Bar Chart created with ODS Graphics:

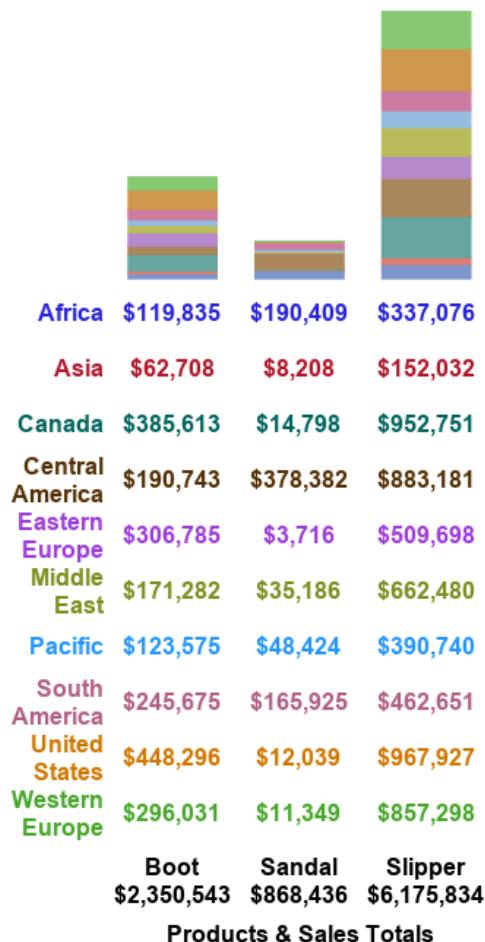


You can compare physical heights of those bar segments that are tall enough to be clearly distinguishable as to colour, but you cannot reliably estimate the Sales values. Increasing the overall height of the image will make more bar segments distinguishable, but will not solve the problem of getting accurate Sales values.

I will save article space by not providing the code used for the above result, but, if desired, will supply it upon receipt of an email request.

Below is the recommended solution. I increased the image height to accommodate the XAXISTABLE and the bar labels with their category totals wrapped beneath them. I stopped increasing the height until the bar segment heights matched the bad alternative shown above. Given the precise values in the XAXISTABLE, the visual element visibility is particularly useful and relevant only to quickly pick out the bigger values, rather than to do visual comparisons among all 30 segments.

Shoe Sales By Region Within Product



In principle and in fact, one can instead use a monochrome XAXISTABLE and a legend, but there is no advantage in requiring the viewer to go to three places to connect segment identity and segment value.

Here is the code for the recommended solution. Instead use the %LET statements that are commented out in green to produce the chart shown at the bottom of this article.

```
%LET ImageWidthInches = 3.65in;
%LET ImageNameSuffix = ThreeCategories;
%LET WHEREstatement = %STR(WHERE Product IN
    ("Boot" "Sandal" "Slipper"));

/*
%LET ImageWidthInches = 10in;
%LET ImageNameSuffix = AllCategories;
%LET WHEREstatement = %STR();
*/

DATA RegionsSelected;
    SET SASHELP.SHOES;
    /* WHERE Statement Below, If Any */
    &WHEREstatement;
    IF Region EQ 'Central America/Caribbean'
    THEN Region = 'Central America';
RUN;
```

```
PROC SUMMARY DATA=RegionsSelected;
    CLASS Product Region;
    VAR Sales;
    OUTPUT OUT=Totals(DROP=_freq_) SUM=;
RUN;

DATA ProductTotalSales
    (KEEP=Product ProductTotalSales);
    SET Totals (WHERE=( _type_ EQ 2));
    ProductTotalSales = Sales;
RUN;

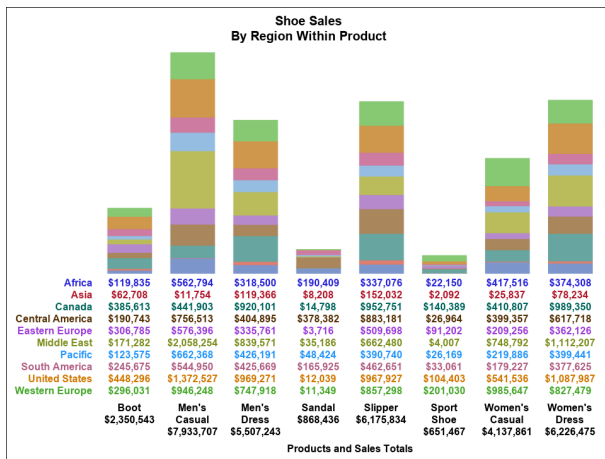
DATA TOCHART(DROP=_type_ Product
    ProductTotalSales);
    LENGTH ProductWithTotal $ 25;
    MERGE Totals(WHERE=( _type_ EQ 3))
        ProductTotalSales;
    BY Product;
    ProductWithTotal = TRIM(Product) ||
        ' ' ||
        TRIM(LEFT(PUT(ProductTotalSales,DOLLAR10.)));
    FORMAT Sales DOLLAR9.;
RUN;

ODS RESULTS=OFF;
ODS _ALL_ CLOSE;
ODS LISTING STYLE=LISTING
    GPATH="C:\VIEWS_News_57";

ODS GRAPHICS ON / RESET=ALL SCALE=OFF
    WIDTH=&ImageWidthInches HEIGHT=7.5in
    IMAGENAME=
        "StackedVBarWithTotals_&ImageNameSuffix";
TITLE1 FONT='Arial/Bold'
    HEIGHT=14pt
    JUSTIFY=CENTER
    /* otherwise the title will be centered
    over the bar area */
    'Shoe Sales';
TITLE2 FONT='Arial/Bold'
    HEIGHT=14pt
    JUSTIFY=CENTER
    /* see above */
    'By Region Within Product';
FOOTNOTE1 FONT='Arial/Bold'
    HEIGHT=12pt
    'Products and Sales Totals';
PROC SGPLOT DATA=TOCHART
    NOBORDER NOAUTOLEGEND;
    VBAR ProductWithTotal / RESPONSE=Sales
    GROUP=Region GROUPDISPLAY=STACK
    /* STACK is default */
    BARWIDTH=0.7 NOOUTLINE
    DISPLAYBASELINE=OFF;
    XAXIS DISPLAY=(NOLABEL NOLINE NOTICKS)
    SPLITCHAR=' ' FITPOLICY=SPLITALWAYS
    VALUEATTRS=(FAMILY=Arial SIZE=12pt
        WEIGHT=Bold);
    YAXIS DISPLAY=NONE;
    XAXISTABLE Sales / COLORGROUP=Region
    LOCATION=INSIDE POSITION=BOTTOM
    TITLE='' LABELPOS=LEFT
    LABELATTRS=(FAMILY=Arial SIZE=12pt
        WEIGHT=Bold)
    VALUEATTRS=(FAMILY=Arial SIZE=12pt
        WEIGHT=Bold);
RUN;

ODS LISTING CLOSE;
```

This example was created at 10 inches width:



LeRoy Bessler, Visual Data Insights™

Ask The Consultant

This part of VIEWS News is where you can get your technical questions answered. Send your questions to the Editor.

Build and Deploy a Web App on SAS in Under 5 Minutes

Q: How easy is it to make a web app for SAS?

A:[SAS 9] There is a demo video about how you can build a web app in under 5 minutes, using open source tools, on SAS 9: “Build and Deploy a Web App on SAS in Under 5 Minutes” at <https://vimeo.com/349223867>

Managing SAS Data Sets in Macros

Q: How do you make certain data sets created in macros don't overwrite data sets in the calling program?

A:[SAS] The simplest naming convention to avoid names that have been used outside of the macro would be to prefix them with two underscores “__dsname”. However, if you are writing a suite of reusable macros which call each other, this may not be adequate. To prevent conflicts a safer way would be to prefix all names with “__macroname_dsname”, which will make them more likely to be unique, but will also make them easier to find and delete at the end of the macro call without impacting related macros:

```
%MACRO abc123(in=, invar=, out=,
              outvar=, keep=N);

DATA __abc123_new;
SET &in.;
&outvar. = UPCASE(&invar.);
RUN;

PROC SORT DATA = __abc123_new
OUT = &out.;
BY &outvar.;
RUN;
```

```
%if %upcase("&keep.") eq "N"
%then %do;
PROC DATASETS LIB = work
NOLIST NOWARN;

DELETE __abc123:
/ MEMTYPE = ALL;

RUN;
QUIT;
%end;

%MEND abc123;

%abc123(in=sashelp.class, invar=name,
out=class_sort, outvar=name_upper)
```

Note the KEEP= parameter in the macro definition, which provides a way to retain intermediate SAS data sets and SAS objects for debugging purposes. Also the IN= and OUT= parameters specify the input and output SAS data sets, which can then be controlled by the programmer.

Philip R Holland (Newsletter Editor)

Extract from “Writing Reusable Macros” by Philip R Holland

Formats, Options, and Functions

This section is devoted to the description of useful, or unusual, SAS Formats, Options, and Functions.

[SAS 9.4M2] These are new aliases for existing informats:

- B8601DXw. => B8601DZw.d
- B8601LXw. => B8601DTw.d
- B8601TXw. => B8601TZw.d
- E8601DXw. => E8601DZw.d
- E8601LXw. => E8601DTw.d
- E8601TXw. => E8601TZw.d

[SAS 9.4M6] The default style for HTML 5.0 output has been changed from HTMLBlue to HTMLEncore.

[SAS 9.4M6] There are now several Data Step functions for GIT operations, which are mostly self-explanatory, including:

- GITFN_COMMIT()
- GITFN_DIFF()
- GITFN_IDX_ADD()
- GITFN_IDX_REMOVE()
- GITFN_PUSH()
- GITFN_PULL()
- GITFN_RESET()
- GITFN_RESET_FILE()
- GITFN_STATUS()

News

PharmaSUG US 2019, Philadelphia, PA

PharmaSUG US 2019 was held at the Downtown Marriott in Philadelphia from 15-19 June. No-one there really believed me, but this was my very first PharmaSUG conference, so I wore my First Timer ribbon with pride alongside my Presenter ribbon. I had presented at SAS Global Forum, which is huge, and at PhUSE, which has now reached 700+ attendees, but I wasn't quite sure how big PharmaSUG would be. In fact this conference, at 950 attendees, was the biggest ever, but it still felt quite small and, as a consequence, friendly.

Even though it was my first PharmaSUG I met lots of my international friends that I would have met at SAS Global Forum, and my presentation about Defensive Programming was well attended with plenty of questions afterwards. I volunteered for 2 sessions of Code Doctors too, but, unlike the sessions at SAS Global Forum, PharmaSUG embraces R and CDISC, so I answered a wide variety of queries, including answering topics on SAS, CDISC, and an R question on string processing with a SAS-ish answer!

This PharmaSUG conference replaced my usual transatlantic trip to SAS Global Forum, but in 2020 I'll be back presenting at SAS Global Forum in Washington DC in March, but then presenting in Beijing at PharmaSUG China 2020 in August, to see how different PharmaSUG China is.

Philip R Holland (Newsletter Editor)

In Brief

- Back issues of *VIEWS News* are available from the VIEWS UK forum at blog.hollandnumerics.org.uk. Please register on the blog, and then request free access to the forum.
- The SAS Professional Forum group on LinkedIn, which currently has over 33,650 members. Everyone is welcome to join, but discussions are restricted to SAS-related topics: www.linkedin.com/groups?gid=70702.
- In the UK and Ireland the SUGUKI group is holding regular meetings in London, and also occasional meetings in Bristol, Dublin, Edinburgh, Leeds and Manchester. For more details and to register for future events please go to www.meetup.com/SUGUKI.

Diary

Are you organising an event that would be of interest to the VIEWS readership? Let us know as we are interested in all non-profit making events related to SAS.

October 2019

1 SAS User Group Germany, Berlin, Germany
Speakers include Katja Glass. For more details see www.meetup.com/SAS-User-Group-Germany.

3 SUGUKI, London, UK

Speakers include Mark Geldart and Laura Illingworth. For more details see www.meetup.com/SUGUKI.

16 SUGUKI, Manchester, UK

Speakers include Steve Burgess and Nik Markovic. For more details see www.meetup.com/SUGUKI.

17-18 SCSUG, Baton Rouge, LA, USA

See www.scsug.org for more details.

20-23 SESUG, Williamsburg, VA, USA

See sesug.org for more details.

22 PhilaSUG, Philadelphia, PA, USA

See philasug.org for more details.

November 2019

3 SUGUKI, London, UK

Speakers include Jonathan Tugman and Nick Feast. For more details see www.meetup.com/SUGUKI.

10-13 PhUSE Connect EU, Amsterdam, Netherlands

The Pharmaceutical Users Software Exchange (PhUSE) conference is the premier programming event for the pharmaceutical industry in Europe. See www.phuse.eu for more details.

March 2020

8-11 PhUSE Connect US, Orlando, FL, USA

The Pharmaceutical Users Software Exchange (PhUSE) conference is now the premier programming event for the pharmaceutical industry in the USA. See www.phuse.eu for more details.

29 March-1 April SAS Global Forum, Washington, DC, USA

The SAS Global Forum (SASGF, formerly called SUGI) is held each year and focuses on the technical aspects of SAS software. See www.sasglobalforum.org for more details.

May 2020

10-13 PharmaSUG US, San Francisco, CA, USA

See the PharmaSUG web site at www.pharmasug.org for further details.

August 2020

28-29 PharmaSUG China, Beijing, China

See the PharmaSUG web site at www.pharmasug.org for further details.

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