

VIEWS

International SAS Programmer Community



News, Hints, Tips and Information for SAS® Users

Issue 77, 3rd & 4th Quarters 2024

This newsletter is the home of Foundation SAS and brings you information about making the most of SAS 9 and Altair SLC. This issue has been delayed, because I under-estimated how much effort organising my significant birthday celebrations would take!. It will, therefore, cover Q3 and Q4 of 2024. This newsletter issue includes a macro that everybody needs to know for categorical data with a group variable from LeRoy Bessler, and Richard Carson gives us 2 useful tips. As usual I have publicised some SAS-related events for the next few months, and I have also added some more SAS formats, options and functions that you may or 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.

Ask The Consultant

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

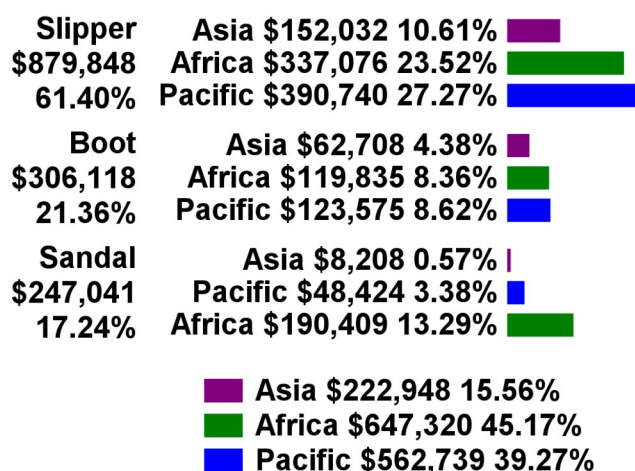
The Most Communication-Efficient and Communication-Effective Bar Chart for Categorical Data that includes a Group Variable

Q: What is the most communication-efficient and communication-effective bar chart for categorical data that includes a group variable?

A: [SAS 9.4] The commonest, though not best, way to handle such data is with a stacked vertical bar chart. I have elsewhere shown the better alternative which includes an x-axis table. Find it and other alternatives in Chapter 4 of the book mentioned at the end of this article. Last month, I finally developed my best solution.

For categorical data, even without a group variable, I have always advocated providing response value and percent of grand total for each category, and recently also that the grand total be provided in the title or subtitle. With a group variable, more pieces of data come into the picture, potentially at least, depending on what you code, the subtotals for each category value and for each group value. There are no ODS Graphics features (that I have found) to make that easy, but I found a less easy way. Below is the absolute best way to visually package all of that information. I DID find a stacked vertical bar chart solution, not shown here, that comes close, but close isn't complete.

Shoe Sales By Region Within Product Products Ordered by Product Total Sales Grand Total \$1,433,007



What is distinctive about this result is that the legend colour swatches are actually superfluous since each bar does have its region identity supplied in its bar label. Here, the important function of the legend is serving as a table of region subtotals.

However, in a chart with many more bars, the colour-coding makes it easy to find all of the bars for any particular region. For example, it is immediately apparent that the largest share of sales is for Slippers in the Pacific Region. A viewer might be curious as to how strong were sales of OTHER products in the Pacific Region. One can just look at the other blue bars to discover that without having to READ the bar labels. Though the legend itself is not the tool in that hunt, the helpful colour-coding is a consequence of its presence.

The code for the example includes a macro that I introduced and discussed in VIEWS News Issue 76 Second Quarter 2024. See that issue for more information about the macro and recommendations related to text for graphs.

```

%MACRO AllGraphTextSetUp(Size, Family = ARIAL,
                          Weight = BOLD);
%LET FamilyForStyle =
  %SYSFUNC(COMPRESS(&Family., ' '));
PROC TEMPLATE;
  DEFINE STYLE
    GraphFont&FamilyForStyle.&Size.Pt&Weight.;
  PARENT = STYLES.LISTING;
  CLASS GraphFonts /
    'GRAPHVALUEFONT' = ("&Family.", &Size.PT,
                        &Weight.)
    'GRAPHLABELFONT' = ("&Family.", &Size.PT,
                        &Weight.)
    'GRAPHDATAFONT' = ("&Family.", &Size.PT,
                        &Weight.)
    'GRAPHTITLEFONT' = ("&Family.", &Size.PT,
                        &Weight.)
    'GRAPHFOOTNOTEFONT' = ("&Family.",
                           &Size.PT, &Weight.);
  END;
RUN;
%MEND AllGraphTextSetUp;

%AllGraphTextSetUp(11);

%LET GrandTotalFormat = DOLLAR10.;
%LET SubTotalFormat = DOLLAR8.;
%LET PercentFormat = 6.2;

PROC SUMMARY DATA=SASHELP.SHOES;
  WHERE Region IN ('Asia' 'Africa' 'Pacific')
    AND Product IN ('Boot' 'Sandal' 'Slipper');
  CLASS Region Product;
  VAR Sales;
  OUTPUT OUT = Totals SUM = Sales;
RUN;

DATA _NULL_;
  SET Totals;
  IF _TYPE_ EQ 0;
  CALL SYMPUT('GrandTotalDisplay',
    TRIM(LEFT(PUT(Sales, &GrandTotalFormat.))));
  CALL SYMPUT('GrandTotal', Sales);
RUN;

DATA RegionAndRegionSales;
  KEEP Region RegionAndRegionSales;
  LENGTH RegionAndRegionSales $64;
  SET Totals;
  WHERE _TYPE_ EQ 2;
  RegionAndRegionSales = TRIM(LEFT(Region))
    || ' '
    || TRIM(LEFT(PUT(Sales, &SubTotalFormat.)))
    || ' '
    || TRIM(LEFT(PUT((Sales / &GrandTotal.) *
                     100, &PercentFormat.)))
    || '%';
RUN;

```

```

DATA ProductAndProductSales;
  KEEP Product ProductAndProductSales;
  LENGTH ProductAndProductSales $64;
  SET Totals;
  WHERE _TYPE_ EQ 1;
  ProductAndProductSales = TRIM(LEFT(Product))
    || ' '
    || TRIM(LEFT(PUT(Sales, &SubTotalFormat.)))
    || ' '
    || TRIM(LEFT(PUT((Sales / &GrandTotal.) *
                     100, &PercentFormat.)))
    || '%';
RUN;

/*PREFIX Region-Product Totals WITH Region
VALUES*/
DATA RegionProductSalesAndPercent;
  KEEP Sales RegionProductSalesAndPercent;
  LENGTH RegionProductSalesAndPercent $64;
  SET Totals;
  WHERE _TYPE_ EQ 3;
  RegionProductSalesAndPercent =
    TRIM(LEFT(Region))
    || ' '
    || TRIM(LEFT(PUT(Sales, &SubTotalFormat.)))
    || ' '
    || TRIM(LEFT(PUT((Sales / &GrandTotal.) *
                     100, &PercentFormat.)))
    || '%';
RUN;

/*Create a format to convert each Region-Product
Sales value (in each Product Cluster) into a
string that consists of the Relevant Region
and that Sales value without Product
identified in the string*/
DATA CNTLIN;
  LENGTH LABEL $64;
  RETAIN FMTNAME 'ValueAndPercent' TYPE 'N';
  SET RegionProductSalesAndPercent
    (RENAME = (Sales = START
               RegionProductSalesAndPercent = LABEL))
    END = Lastone;
  OUTPUT;
  IF LastOne THEN DO;
    HLO = 'O';
    LABEL = '***ERROR***';
    OUTPUT;
  END;
RUN;

PROC FORMAT LIBRARY = WORK CNTLIN = CNTLIN;
RUN;

DATA RegionProductSales;
  SET Totals;
  WHERE _TYPE_ EQ 3;
RUN;

DATA Nearly;
  DROP Region;
  MERGE RegionProductSales RegionAndRegionSales;
  BY Region;
RUN;

PROC SORT DATA = Nearly;
  BY Product;
RUN;

```

```

DATA ToPlot;
  DROP Product;
  MERGE Nearly ProductAndProductSales;
  BY Product;
RUN;

FOOTNOTE; /*erase any leftover*/

ODS LISTING GPATH = "C:\TEMP" DPI = 300
           STYLE = GraphFontArial11ptBold;
ODS GRAPHICS ON / RESET = ALL SCALE = OFF
  WIDTH = 3.65IN HEIGHT = 3.65IN
  IMAGENAME =
    "BestBarChartForCategoriesWithGroupVariable";

TITLE1 J = L
  "Shoe Sales By Region Within Product";
TITLE2 J = L
  "Products Ordered By Product Total Sales";
TITLE3 J = L "Grand Total &GrandTotalDisplay.";

PROC SGPLOT DATA = ToPlot NOBORDER;
  STYLEATTRS DATACOLORS = (blue green purple);
  /*arrange the colour order to your
  preference*/
  HBAR ProductAndProductSales /
    RESPONSE = Sales CATEGORYORDER = RESPDESC
    GROUP = RegionAndRegionSales
    GROUPDISPLAY = CLUSTER DATALABEL
    DATALABELPOS = LEFT BARWIDTH = 0.7
    NOOUTLINE DISPLAYBASELINE = OFF;
  FORMAT Sales ValueAndPercent.;
  YAXIS DISPLAY = (NOLINE NOTICKS NOLABEL)
    SPLITCHAR = ' ' FITPOLICY = SPLITALWAYS;
  XAXIS DISPLAY = NONE;
  LABEL Sales = '00'X
    ProductAndProductSales = '00'X;
  KEYLEGEND / SORTORDER = REVERSEAUTO
    /*match the order of the bars within each
    cluster*/
  TITLE = '' NOBORDER ACROSS = 1
  FILLHEIGHT = 9PT /*match height of labels*/
  FILLASPECT = GOLDEN /*rather than a square,
  use rectangle with more area for colour
  fill*/
  AUTOOUTLINE;
RUN;

ODS LISTING CLOSE;
TITLE;

```

It is regrettable that this example did not appear in the book *Visual Data Insights Using SAS ODS Graphics: A Guide to Communication-Effective Data Visualization*. The author warrants that its contents are (in pharmaceutical industry language) safe and effective.

LeRoy Bessler, Bessler Consulting and Research

Did You Know?

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

Convert numeric values to text with no NOTE

[SAS 8 and Altair SLC] Use CATS(number) to convert a value in numeric form to text without incurring a NOTE in the log.

CATS(right aligned_expression) is the equivalent of TRIM(LEFT(right_aligned_expression)), but without the NOTE.

Richard C Carson

PICTURE formats with full month names

[SAS 9 and Altair SLC] To express a date or datetime as full month name with 4-digit year, e.g. for a report title, create the following PICTURE formats:

```

OPTIONS VALIDFMTNAME = LONG;

PROC FORMAT;
  PICTURE fullmonthyeardt (DEFAULT = 16)
    OTHER = '%B %Y' (DATATYPE = DATE);
  PICTURE fullmonthyeardttm (DEFAULT = 16)
    OTHER = '%B %Y' (DATATYPE = DATETIME);
RUN;

```

The result will be right-aligned within the default length.

Richard C Carson

Formats, Options, and Functions

This section is devoted to the description of useful, or unusual, SAS Formats, Options, and Functions. Please read the SAS documentation to find out more about them.

[SAS] The SAS format \$MSGCASEw. writes character data in uppercase when the -MSGCASE system option is in effect. The SAS configuration option -MSGCASE displays all warning, note and error messages in upper-case. The SAS configuration option -NOMSGCASE displays all warning, note and error messages in mixed case, and is the default setting.

[SAS 9 and Altair SLC 2024] PROC JSON can now write JSON files using the PRETTY or NOPRETTY option. The NOPRETTY option generates smaller JSON files by removing all newline characters.

[SAS and Altair SLC 2024] Fuzzy matching of words can be done using the SOUNDEX(), SPEDIS() and COMPGED() functions.

In Brief

- Back issues of *VIEWS News* are available from the VIEWS UK forum at **blog.hollandnumerics.org.uk**. Please register for free membership on the blog, and then request free access to the VIEWS UK forum.
- The SAS Professional Forum group on LinkedIn, which currently has over 40,900 members. Everyone is welcome to request to join, but discussions here are restricted to SAS-related topics: **www.linkedin.com/groups?gid=70702**.

- The SAS Opportunities group on LinkedIn, which currently has over 22,200 members. Everyone is welcome to request to join, but discussions here are also restricted to SAS-related topics: www.linkedin.com/groups?gid=805217.
- In the UK and Ireland the SUGUKI group have been holding regular meetings in London, online, and also occasional meetings in Bristol, Dublin, Edinburgh, Leeds and Manchester. For more details and to register for future events please go to meetup.com/SUGUKI.
- Fancy joining the SAS Global Analytics Explorers hub, then please fill in your **name**, **company email address** and **company** at <https://infl.tv/npmv>.
- Altair SLC Personal Edition provides named users with free access to Altair SLC and Analytics Workbench software (formerly WPS) including a SAS language compiler with coding and workflow tools on unlimited data volumes, with interfaces to a wide range of databases, as well as integrated R and Python programming environments. When the Personal Edition software is downloaded, it includes a licence for up to 12 months. At the end of this term, users should download a new copy of the software to renew their licence and/or to upgrade to the latest available full version. Download the software from www.altair.com/altair-slc. No technical support service is offered with the Personal Edition, but assistance can be requested using the Community forums at community.altair.com/community. The current General Access version of Altair SLC is 5.24.2 (2024).
- Do you use Microsoft Visual Studio Code Editor?
 - You may be interested in a SAS-related extension called **SASjs - DevOps for SAS**. You can develop SAS applications and run code on SAS Viya, SAS 9 EBI or SASjs Server! Just set up the target, and click the running man to execute your SAS code. The SASjs Server could be your local SAS installation. SASjs is an open source project, and can be obtained from the Visual Studio Code Marketplace, where the current version is v2.6.0.
 - The SAS Institute has also been developing its own extension called **SAS**. You can develop SAS applications and run code on local SAS installations, SAS Viya, or SAS OnDemand for Academics! Just set up the target, and click the running man to execute your SAS code. The extension can be obtained from the Visual Studio Code Marketplace, where the current version is v1.11.0.
 - Another Microsoft Visual Studio Code Editor extension has just been released called **Altair SLC**. This extension currently only allows you to connect to local Altair SLC installations, even if, until now, you have only been able to use Altair Analytics Workbench to access Altair SLC. The current version in the Visual Studio Code Marketplace is v0.7.1 (pre-release).

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.

March 2025

16-19 **PhUSE US Connect**, Orlando, FL, USA

The PhUSE Community allows you to enhance your learning and gain insights from our experts on today's most critical industry topics through a variety of engaging presentations, workshops, and networking opportunities. Individuals from all areas of the industry will be gathered in one place, providing an opportunity not only for you to advance your career but also to heighten the pharmaceutical industry's influence and findings. Full details at www.phuse.eu.

May 2025

6-9 **SAS Innovate**, Orlando, FL, USA

Whether you're a business leader, technical user or SAS Partner, SAS Innovate is a no-risk, all-reward opportunity to learn how to succeed with data and AI. Full details can be found at www.sas.com/en_us/events.

June 2025

1-4 **PharmaSUG US**, San Diego, CA, USA

Join us for the premier event of the year for statistical programmers, statisticians, data managers, researchers, and others who analyze data in the life sciences - PharmaSUG 2025! Full details at www.pharmasug.org.

Contacts

LeRoy Bessler	Email: besslerleroy2024@gmail.com
Richard C Carson	Email: richard@arcol-analytics.com
SAS UK	Tel: +44-(0)1628-486933 Web: www.sas.com/uk
VIEWS	
Web Site	Web: blog.hollandnumerics.org.uk
Newsletter Editor	Email: views-uk@hollandnumerics.org.uk

VIEWS News is published quarterly for the VIEWS International SAS Programmer Community by Holland Numerics Limited.