

Oh, There's No Place Like SAS® ODS Graphics for the Holidays!

Ted Conway, Chicago, IL

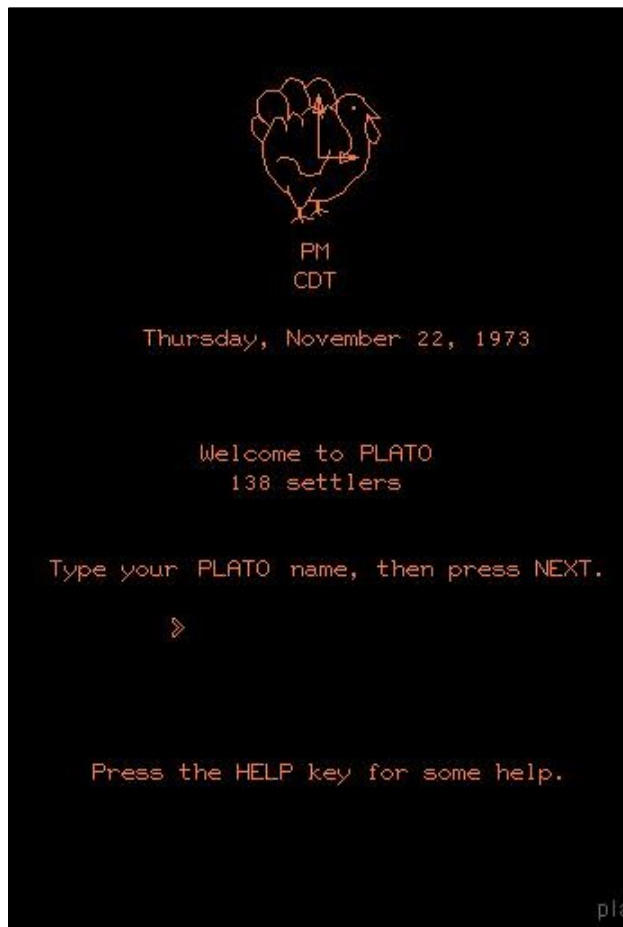
ABSTRACT

Already a SAS ODS Graphics user at work, the author used the (*free!*) SAS University Edition software he'd recently downloaded and installed on his home laptop to knock out a connect-the-dots Tom Turkey with PROC SGPLOT to commemorate Thanksgiving 2015. And so began an ongoing series of "Fun with SAS ODS Graphics" posts on the SAS Support Communities and Twitter that celebrated major holidays and other events. While creating these admittedly frivolous charts from the comfort of his easy chair, the author learned some useful techniques for creating serious data vizzes, which will be shared in this session and the accompanying paper.

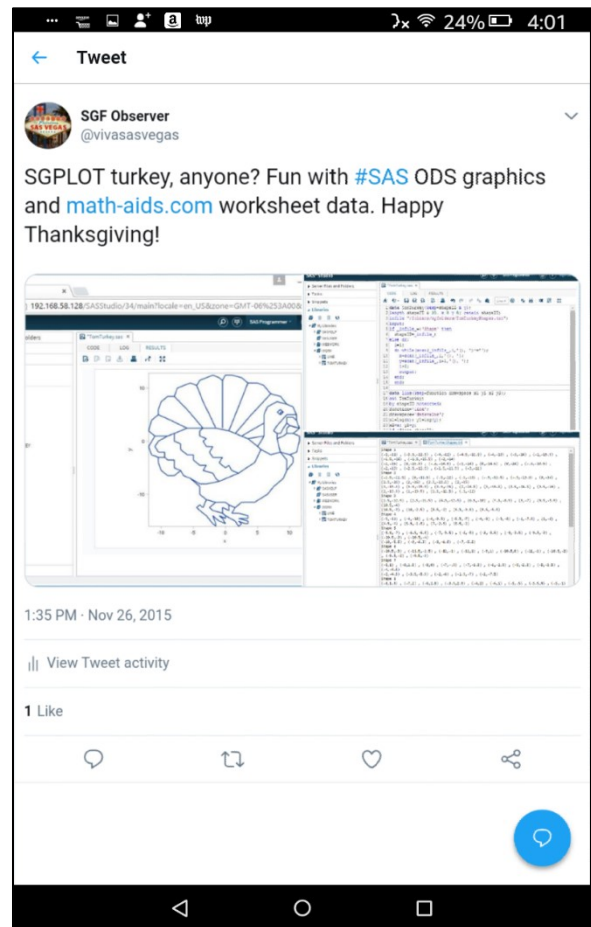
INTRODUCTION

Don't ask me why, but some people – myself included – have felt compelled to write silly little computer programs to create holiday-themed images for the better part of a half-century. So, I suppose it's not too surprising that I opted to test out my newly-downloaded SAS University Edition software by using ODS Graphics to knock out a line drawing of a Tom Turkey. After all, it was Thanksgiving (2015) and I'd stumbled across a site for Math Teachers that included x and y coordinate pairs for holiday characters (for kids to create connect-the-dots puzzles). Hey, what else was I supposed to do?

PLATO, Nov 22, 1973 (Source: [PLATO History](#))

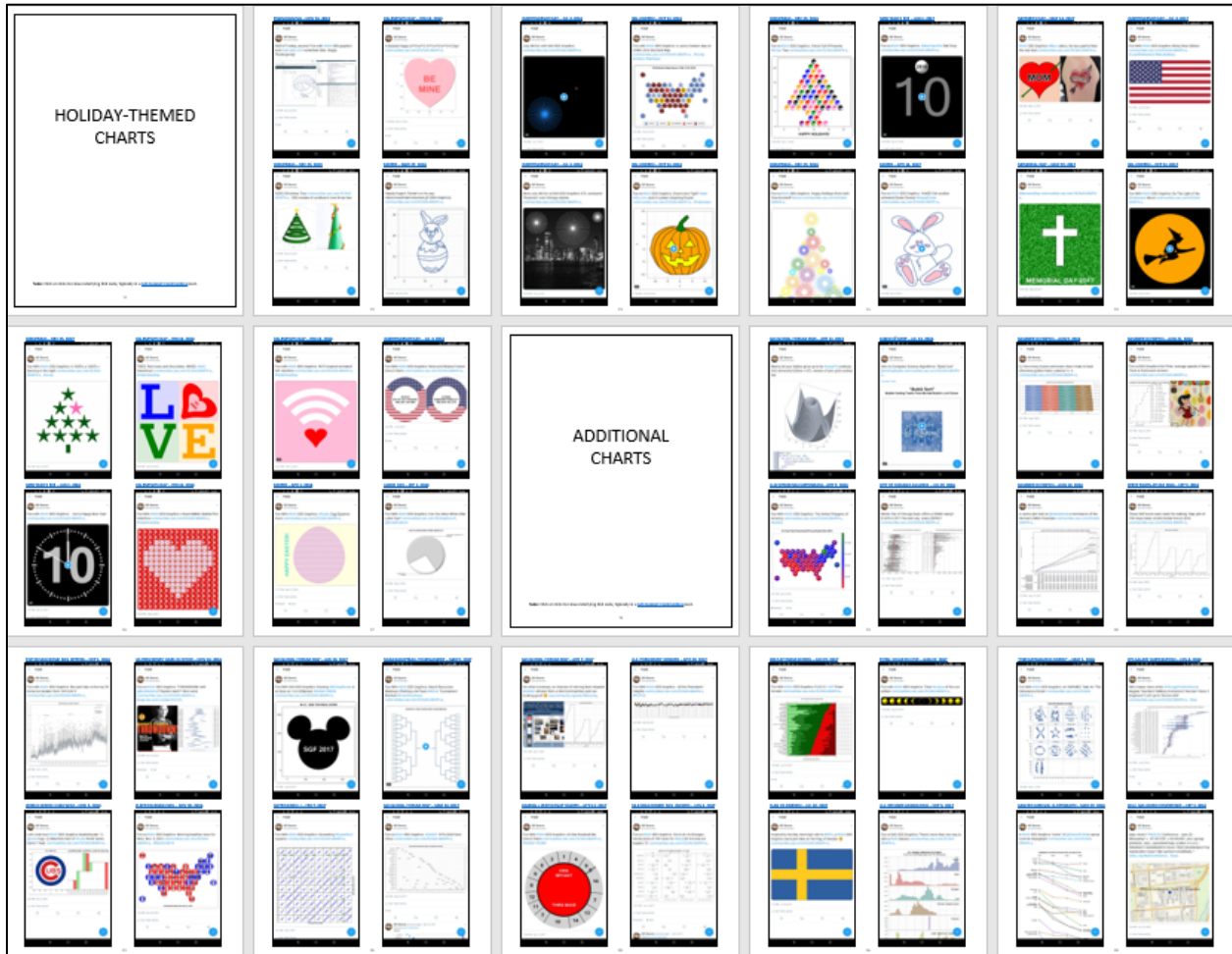


Twitter, Nov 26, 2015



After posting my "Happy Thanksgiving!" greeting on Twitter and SAS-L, Chris Hemedinger spotted it and suggested also sharing any future holiday programming doodles on SAS Support Communities (Chris also provided a model post showing how to document SAS code, input, and output!). And that, kids, was all the encouragement I needed to begin a series of "Fun with SAS ODS Graphics" posts!

A “FUN WITH SAS ODS GRAPHICS” GALLERY



The Appendix contains larger versions of the Twitter screenshot thumbnails shown above together with links to the underlying SAS ODS Graphics code, typically part of a SAS Support Communities post that also includes any input data and output images (including some animated GIFs).

Almost three years later, there are still some holidays left on my Fun with SAS ODS Graphics to-do list, but New Year’s Eve, Valentine’s Day, Easter, Mother’s Day, Memorial Day, Fourth of July, Labor Day, Halloween, Thanksgiving, and Christmas have all been tackled at least once.

In addition to the holiday-themed posts, other events covered in the Fun with SAS ODS Graphics series have included SAS Conferences, the Summer Olympics, the recent Total Solar Eclipse, March Madness, the World Series (Cubs win!), and Super Bowl LI.

Other subjects that caught my attention and got the SAS ODS Graphics treatment include K-12 Education Funding, Sort Algorithms (Bubble), Public Employee Salary/Overtime Pay Distributions, iPhone Fitness Data (Steps), MLB Batting Statistics, U.S. Presidents’ Ages and Heights, U.S. Presidential Election Results/Headlines, AP Exam Score Distributions, Flag Designs, U.S. Refugee Admissions, Misleading Descriptive Statistics, and Cancer Survival Rates.

In the next section, we’ll take a quick look at one of the “Fun with SAS ODS Graphics” SAS Support Communities posts, so you can see what kind of content you can expect to find there.

By the way, if SAS ODS Graphics is new to you (or if you’d like a quick refresher!), a short three-page ‘elevator pitch’ for why you might want to consider adding it to your bag of SAS tricks can be found at the end of this paper, together with a few introductory examples that illustrate several ODS Graphics takes on a bar chart presentation of data (sashelp.prdsale).

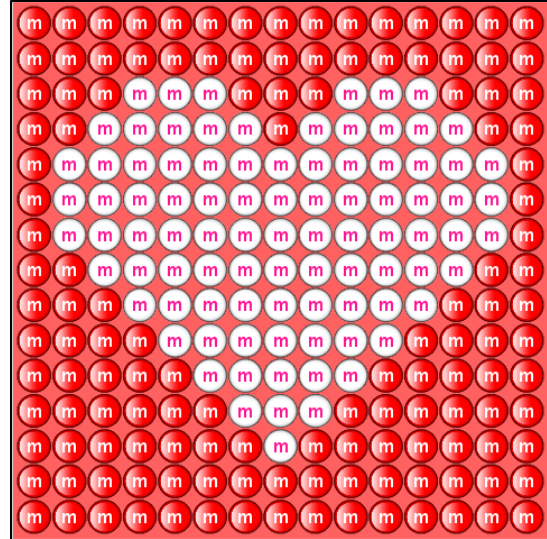
FUN WITH SAS ODS GRAPHICS: I HEART M&MS VALENTINE

The image to the right was created using the code below for the [Challenge for SAS Nerds: Build a SAS Valentine](#).

Because ODS Graphics supports a layered approach to chart-building (a la R's ggplot2 or Python's matplotlib), this could be easily accomplished by combining:

1. A rose-colored **background**
2. A **bubble chart** of red M&M's, using the option `dataskin=sheen` to get a 3D, candy-like look
3. A **text chart** of white "m" labels for the red M&M's
4. A **bubble chart** of white M&M's
5. A **text chart** of red "m" labels for the white M&M's

Just click Run and – voila! – you have a neat, if not quite Hallmark-quality, valentine!



```
* Fun w/SAS ODS Graphics: I Heart M&Ms Valentine;

data red(keep=x y m s rename=(x=x1 y=y1)) white(keep=x y m s rename=(x=x2 y=y2));
retain m "m" s 1;          * M&M letter ("m"), M&M size (1);
do y=15 to 1 by -1;       * Read in 15x15 M&M valentine layout template from inline data;
  input mms $15.;         * X=Background M&M (red), *=Heart M&M (white);
  do x=1 to 15;          * Output points for plot;
    if substr(mms,x,1)="X" then output red;
    else output white;
  end;
end;
cards;
XXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXX
XXX**XX**XX
XX****X****XX
X*****X
X*****X
X*****X
XX*****XX
XX*****XX
XXX*****XXX
XXXX*****XXX
XXXXX****X
XXXXX***X
XXXXXX*XXXX
XXXXXXXXXXXX
XXXXXXXXXXXX
;
data mms;                  * Put M&Ms all together;
set red white;

                                * Plot M&Ms valentine!;
ods graphics on / reset=index imagefmt=png antialias=on height=5in width=5in dataskinmax=500;
proc sgplot data=mms noautolegend noborder pad=0 aspect=1 nowall subpixel;
styleattrs backcolor=rose;
* 1. Background M&Ms (red);
bubble x=x1 y=y1 size=s / dataskin=gloss bradiusmin=15 fill fillattrs=(color=red);
text x=x1 y=y1 text=m / textattrs=(family="Albany AMT Bold" size=12pt color=white weight=bold)
position=center vcenter=bbox contributeoffsets=none strip;
* 2. Heart M&Ms (white);
bubble x=x2 y=y2 size=s / dataskin=gloss bradiusmin=15 fill fillattrs=(color=white);
text x=x2 y=y2 text=m / textattrs=(family="Albany AMT Bold" size=12pt color=deeppink weight=bold)
position=center vcenter=bbox contributeoffsets=none strip;
xaxis display=none offsetmin=0 offsetmax=0 min=.4 max=15.6 values=(.4 15.6); * Suppress labels/ticks on
axes, set bounds;
yaxis display=none offsetmin=0 offsetmax=0 min=.4 max=15.6 values=(.4 15.6);
```

WHAT I'VE LEARNED

There are, of course, always lessons to be learned from play. Indeed, some of the techniques I've picked up knocking out these "doodles" while watching TV have proven to be useful in my day job. And having the programs available on SAS Support Communities gives me access to a wealth of code snippets at work that are just a Google search away!

Borrowing the random thoughts format of the old *What I've Learned* interviews in Esquire and Larry King's *It's My Two Cents* columns in USA Today, here's some of what I've learned from my Fun with SAS ODS Graphics posts:

- The first rule of Fun with SAS ODS Graphics club is to **always use SGPLOT** (it keeps things simple!). The second is to use GTL (PROC TEMPLATE, PROC SGRENDER) when you can't use SGPLOT!
- Don't be afraid to **"stack up" your charts and chart types in layers** – SAS ODS Graphics doesn't limit you to a simple line-bar combo. Remember, order counts, so use statements so they produce output in the desired "z-order" and use transparency when helpful.
- Surprisingly, people seem to be **more engaged than annoyed by animated GIFs**. The same technique you use to draw an animated Easter bunny can also be used to effectively show cumulative sales growth over time following a product launch, calls arriving in a contact center, etc.
- You can often **get away with using the STYLEATTRS option** to specify colors and other attributes, but Attribute Maps (discrete and range) eliminate any doubt and offer the utmost in flexibility.
- If you like Excel's data tables, **you'll love ODS Graphics' XAXISTABLEs**. There are also YAXISTABLEs, too, and both have position options (inside or outside) that allow you to augment your charts with lots of statistics for viewers.
- I don't always need to worry about **aspect ratios** to get consistent x and y axis scales, but when I do, ASPECT = 1 (SGPLOT) or LAYOUT OVERLAYEQUATED / EQUATETYPE=SQUARE (GTL) are life-savers. Without them, your image will look like a bad photo that's been stretched in just one direction!
- You can **share some photos or other images** in your charts using an annotate dataset (with function="IMAGE") or the SYMBOLIMAGE statement.
- When specifying color values, in addition to the SAS-defined names, you can also specify **16,777,216 RGB combinations in CXrrggbb notation**. Also, check out sites like [ColorBrewer](#) to get values to use in your COLORMODEL options.
- Macros, PROC SQL, and BY statements are all surprisingly useful tools for **building a series of incremental images** for an animation (PRINTERPATH=GIF).
- Don't forget to use the numerous options to **format your data!**
- Line, bar, scatter, and pie charts are all fine, but don't forget to **try less often-used chart types** – dot plots, box plots, step plots, vector plots (with/without arrows!), bubble charts, waterfall charts, high-low charts, maps, needle plots, polygon plots.
- If you can get away with it, **let SAS choose your defaults**. Otherwise, your bread-and-butter options for fonts and other items are likely to be SIZE=, COLOR=, SYMBOL=, WEIGHT=, FAMILY=, PATTERN=, THICKNESS=.
- You can **cobble together cartograms** easily as a neat alternative to traditional U.S. maps and convey state-level information without having to worry about those tiny eastern seaboard states!
- You'll want to **override axis defaults** more than you'd expect – e.g., change or eliminate labels, modify attributes, change ticks, specify MAX/MIN values, use RANGES for "broken" axes.
- SAS usually figures things out, but you can specify **DISCRETE, TIME, or LINEAR** for your axes.
- Defaults are often OK, but you may need to **specify image resolution** (IMAGE_DPI=) and size (HEIGHT=, WIDTH=), as well as an output image file name/location (NAME=, GPATH=).
- When things like text, markers, and lines collide or overlap, **try using TRANSPARENCY options**.

WHAT I'VE LEARNED (CONT.)

- Remember, **a circle is merely an ellipse** where SEMIMAJOR=SEMIMINOR.
- If x/y axis options aren't getting you the labels and gridlines you need, **try using REFERENCELINES**.
- Looking at things from different angles? Try **SGPANEL/SGSCATTER, GTL, and BY statements!**
- Does your TEXT look off-center? Don't forget to **specify STRIP=TRUE** to get rid of trailing spaces!
- For better or worse, we live in an emoji world ☺. Remember that **Unicode is an option for text and markers** (e.g., SYMBOLCHAR). Check out sites like [Unicode.org](https://unicode.org) to see what's available!
- **To save real estate**, suppress axis labels and color legends when things are obvious without them (e.g., green=good red=bad). You can also save real estate by creating custom legends and/or repositioning legends to take advantage of free space in charts.
- TITLES and FOOTNOTES are convenient, but also eat up real estate. Consider the use of ENTRY, DRAWTEXT, and INSET to **put this info in otherwise blank areas of your charts**.
- Don't overuse it, but sometimes **the BACKLIGHT option has a nice effect** in TEXT plots, rendering text more readable by making it pop, especially in color-on-color scenarios!
- Need a Gantt chart, but don't have SAS/OR? Try an ODS Graphics **High-Low Chart** (w/TYPE=BAR).
- When input data is neat (think Excel or .csv), **PROC IMPORT is your friend**; when it's messy, INPUT, _INFILE_, and SCAN can save the day!
- If you need to create plots that don't exist (for now – ODS Graphics is constantly enhanced!), you can always **roll-your-own**, e.g., Ellipseparm Plots + Vector Plot + Text plot = Donut chart!
- PROC FCMP **supports recursive programming**. Who knew?
- **DATASKINS can be cheesy**, but sometimes they're just what the Doctor ordered.
- SCATTER charts and the CURVELABEL option do a pretty amazing job of **avoiding label collision**, and you can always turn to PROC TEXT if you need even finer control over label placement/content.
- If they don't get in the way, **GRIDs are helpful to group data**, as are BANDs & REFLINES.
- It deviates a bit from the rest of the ODS Graphics model, but **if local geographic info is desired** (e.g., streets, street names), give the new SGMAP option a try!
- **GTL is intimidating**, but only until you have your first working example!
- Specify **INCLUDEMISSINGGROUP=FALSE** if your dataset has points you want to exclude from certain drawing statements.
- **Use SPLITCHAR=* to split strings into multiple lines** in TEXT plots (much like you use SPLIT='*' in PROC PRINT!).
- Microsoft Paintbrush can be used to **get x and y coordinates of points** in images you're trying to reproduce with SAS ODS Graphics.
- **3-D is cool** (SURFACEPLOTPARM), but a challenge for my apparently 2-D mind.
- A stacked bar chart can be **indistinguishable from a stacked area chart**.
- If the basic charts don't do what you want, you can **use your high school algebra/trig** (e.g., cosines, sines) to plot equations (remember that SAS tends to prefer radians to degrees for angles!). When plotted equations aren't smooth enough, try more points, a thicker line (THICKNESS=), or SPLINE
- You can use the **REVERSE axis option** to display top-ranked (#1) items at the top of the y-axis.
- There's **no SGPLOT for pie charts**. Not sure if that's because SAS wanted to discourage its (mis)use, but it's available via GTL when you need it (and you eventually will!).
- Use **SAS Support Communities** to find answers, share work, and get/give feedback!

CONCLUSION

Whether you're writing silly little programs to create holiday-themed images at home or doing serious data visualization at work, the SAS ODS Graphics procedures and statements provide an easy-to-use, flexible, rich feature set for data visualization that promotes reproducibility and scalability.

So, if you're seeking a better way of producing better charts and graphs – and who isn't these days? – make sure that SAS ODS Graphics is in your bag of dataviz tricks!

REFERENCES

Allison, Robert. "A periodic table to help you with your SAS ODS graphics!" Available at <https://blogs.sas.com/content/sastraining/2018/.../a-periodic-table-of-sas-ods-graphics/>

Allison, Robert. "Robert Allison's SAS/Graph Examples!" Available at <http://robslink.com/SAS/>

SAS. "Graphically Speaking. Data Visualization with a focus on SAS ODS Graphics." Available at <https://blogs.sas.com/content/graphicallyspeaking/>

SAS. "SAS Product Documentation." Available at <http://support.sas.com/documentation/index.html>

SAS. "SAS Support Communities." Available at <https://communities.sas.com/>

CONTACT INFORMATION

Your comments and questions are valued and encouraged. Contact the author at:

Ted Conway
ted.j.conway@gmail.com
[@vivasasvegas](https://twitter.com/vivasasvegas) (Twitter)

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HOLIDAY-THEMED CHARTS

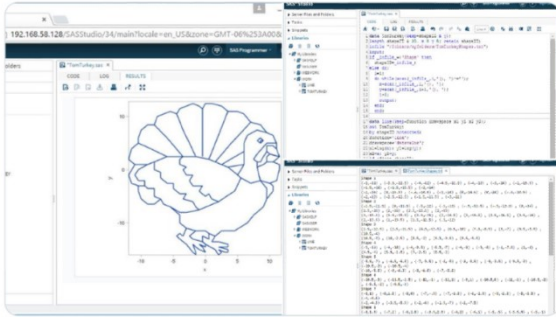
Note: Click on links to view underlying SAS code, typically in a [SAS Support Communities](#) post.

THANKSGIVING – NOV 26, 2015

Tweet

SGF Observer
@vivasasvegas

SGPLOT turkey, anyone? Fun with #SAS ODS graphics and math-aids.com worksheet data. Happy Thanksgiving!



1:35 PM · Nov 26, 2015

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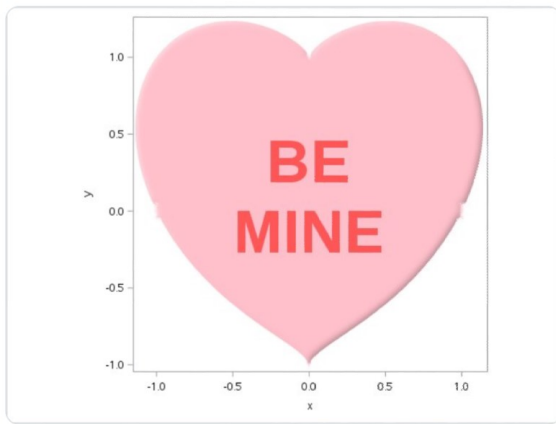
1 Like

VALENTINE'S DAY – FEB 14, 2016

Tweet

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A Belated Happy $(x^{**2}+y^{**2}-1)**3-x^{**2}*y^{**3}=0$ Day!
communities.sas.com/t5/SAS-GRAPH-a...



11:30 PM · Feb 14, 2016

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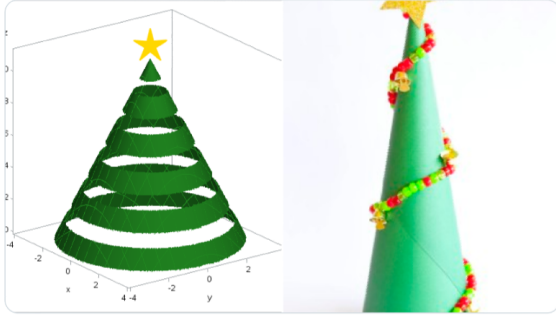
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CHRISTMAS – DEC 25, 2015

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O(DS) Christmas Tree communities.sas.com/t5/SAS-GRAPH-a... ODS remake of cardboard cone Xmas tree



7:10 PM · Dec 20, 2015

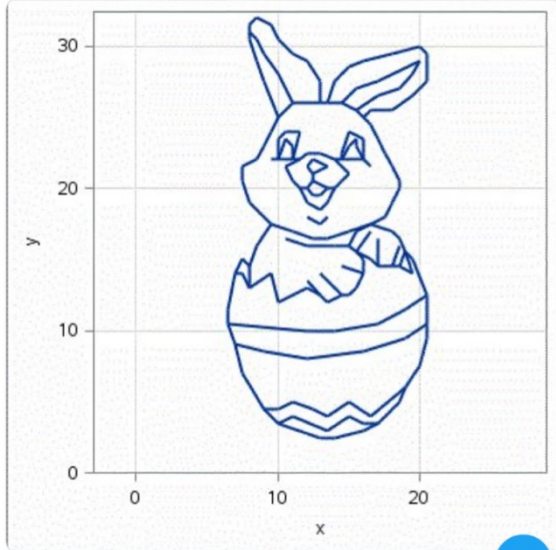
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EASTER – MAR 27, 2016

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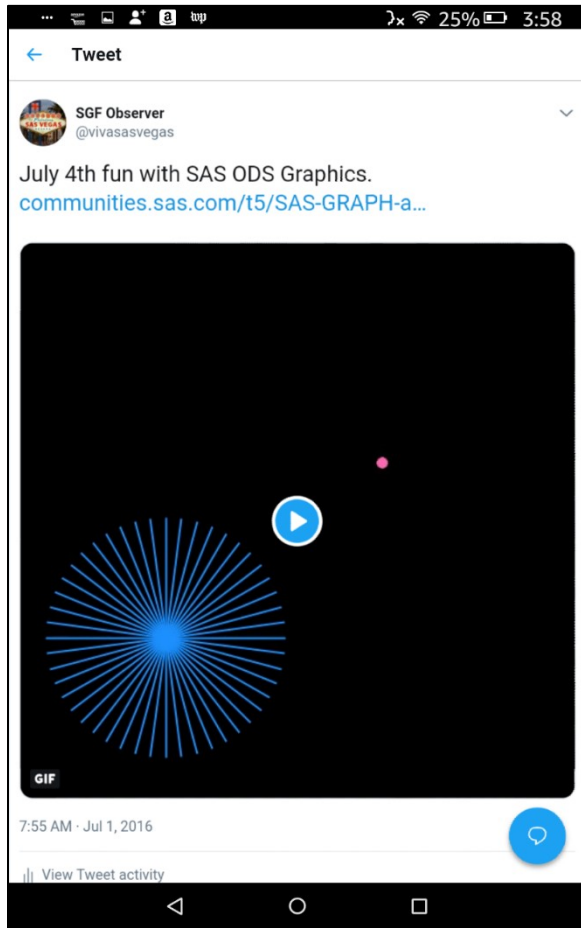
SGF Observer
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Hippity hoppin', Easter's on its way:
HereComesPeterCottontail.gif (ODS Graphics)
communities.sas.com/t5/SAS-GRAPH-a...

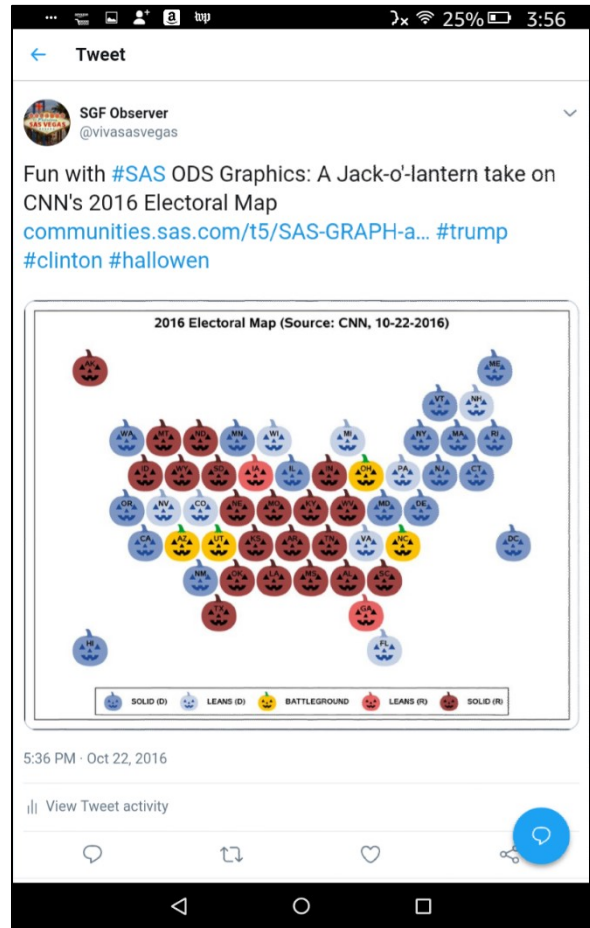


11:38 PM · Mar 20, 2016

INDEPENDENCE DAY – JUL 4, 2016



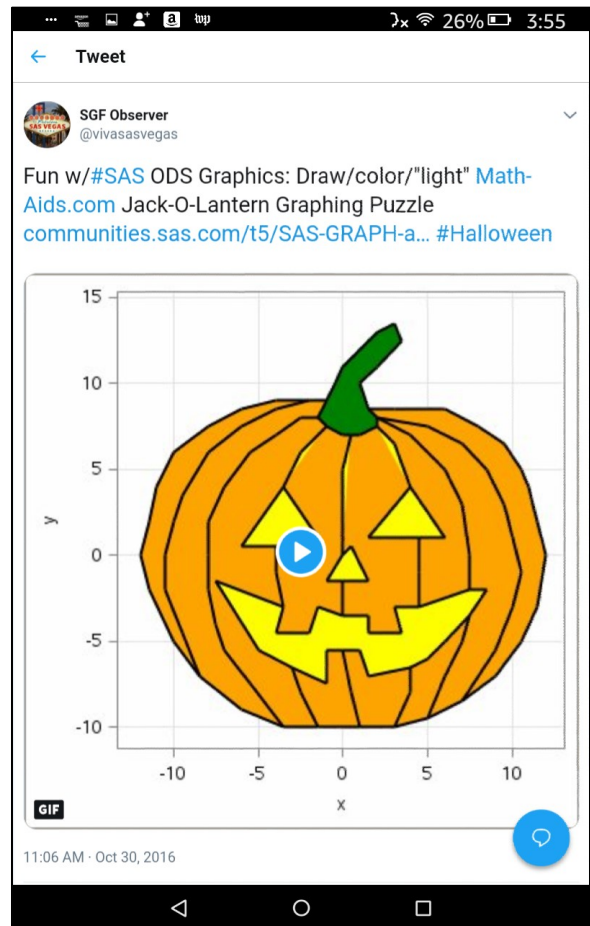
HALLOWEEN – OCT 31, 2016



INDEPENDENCE DAY – JUL 4, 2016



HALLOWEEN – OCT 31, 2016




CHRISTMAS – DEC 25, 2016

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Fun w/#SAS ODS Graphics: Chock Full O'Presents #Xmas Tree communities.sas.com/t5/SAS-GRAPH-a...



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12:42 PM · Dec 31, 2016

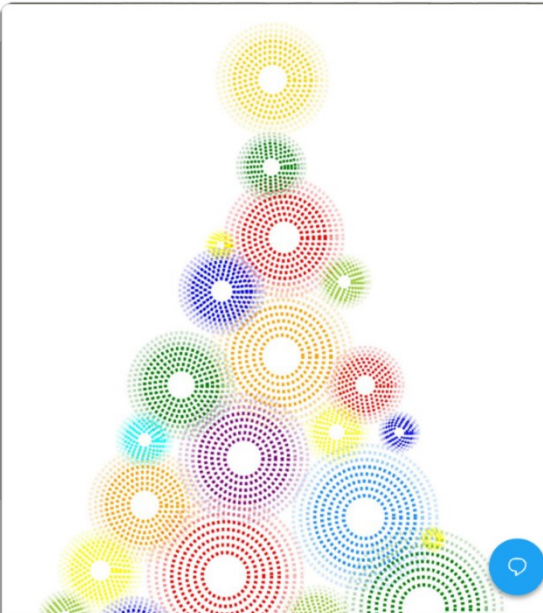
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3:53

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Fun w/#SAS ODS Graphics: YAAEB (Yet another animated Easter Bunny) #HappyEaster communities.sas.com/t5/SAS-GRAPH-a...



3:10 PM · Apr 16, 2017


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#SAS ODS Graphics #Mom tattoo, far less painful than the real deal communities.sas.com/t5/SAS-GRAPH-a...



3:03 PM · May 14, 2017

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Fun With #SAS ODS Graphics: Betsy Ross Edition communities.sas.com/t5/SAS-GRAPH-a...
#July4thWeekend #BeLikeBetsy



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MEMORIAL DAY 2017

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Fun With #SAS ODS Graphics: By The Light of the #Halloween Moon communities.sas.com/t5/SAS-GRAPH-a...



GIF

1:32 AM · Oct 31, 2017

CHRISTMAS – DEC 25, 2017



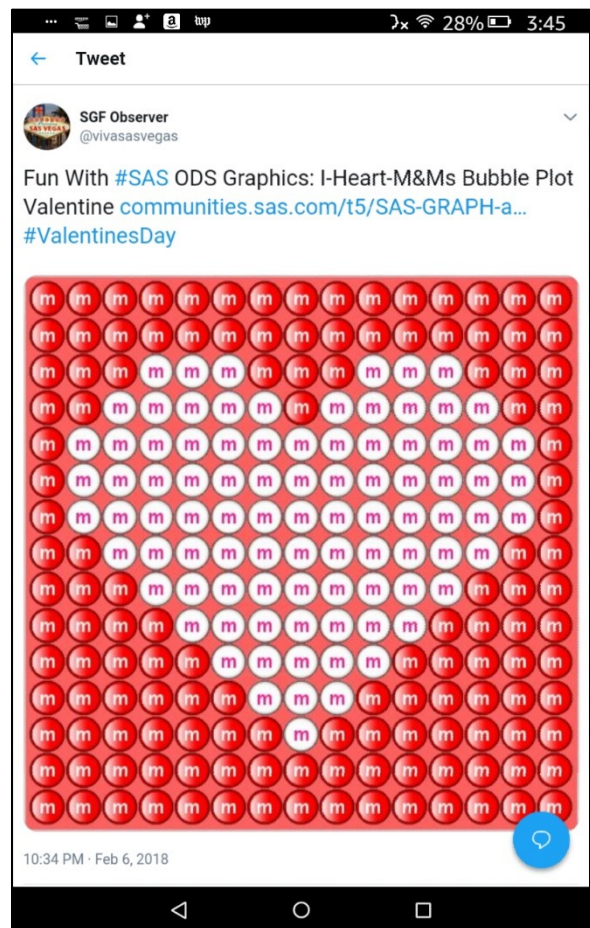
VALENTINE'S DAY – FEB 14, 2018



NEW YEAR'S EVE – JAN 1, 2018



VALENTINE'S DAY – FEB 14, 2018



VALENTINE'S DAY – FEB 14, 2018

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Fun with #SAS ODS Graphics: Wi-Fi inspired animated GIF valentine communities.sas.com/t5/SAS-GRAPH-a... #ValentinesDay



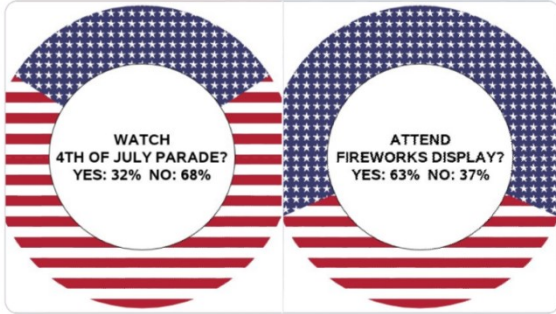
10:31 PM · Feb 12, 2018

INDEPENDENCE DAY – JUL 4, 2018

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Fun With #SAS ODS Graphics: Stars-and-Stripes-Forever Donut Charts communities.sas.com/t5/SAS-GRAPH-a...



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Fun With #SAS ODS Graphics: #Easter Egg Equation Hunt communities.sas.com/t5/SAS-GRAPH-a...



11:27 PM · Mar 31, 2018

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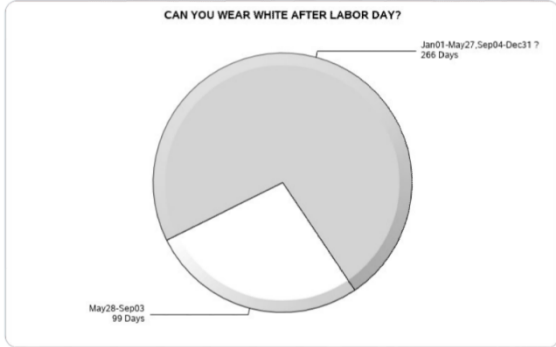
1 Retweet 3 Likes

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Fun With #SAS ODS Graphics: Can You Wear White After Labor Day? communities.sas.com/t5/Graphics-Pr...@EmilyPostInst



2:49 AM · Sep 3, 2018

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ADDITIONAL CHARTS

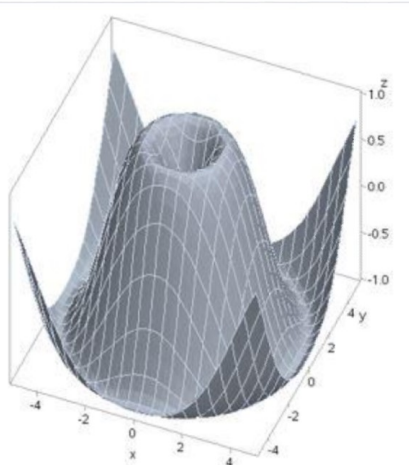
Note: Click on links to view underlying SAS code, typically in a [SAS Support Communities](#) post.

SAS GLOBAL FORUM 2015 – APR 11, 2015

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SGF Observer @vivasasvegas

Mama, let your babies grow up to be #sasgf15 cowboys. SAS University Edition + GTL version of proc g3d cowboy hat.



```

1 data hat;
2 do x=-5 to 5 by .25;
3   do y=-5 to 5 by .25;
4     z=sin(sqrt(x*x+y*y));
5     output;
6   end;
7 end;
    
```

BUB[B]LÉ SORT – JUL 24, 2016


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Intro to Computer Science Algorithms: "Bubl  Sort" @michaelbuble communities.sas.com/t5/SAS-GRAPH-a...

Translate Tweet

"Bubl  Sort"
Bubble Sorting Tracks From Michael Bubl 's *Let It Snow*



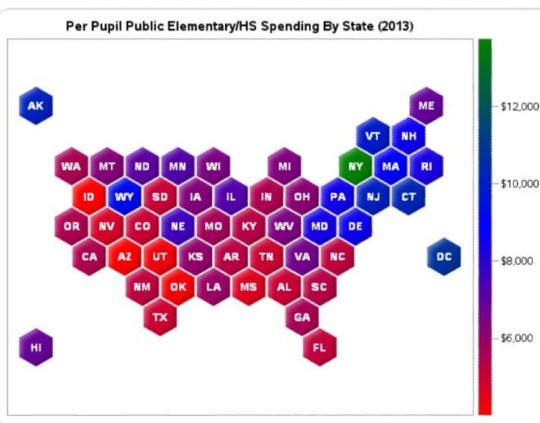
GIF

K-12 SPENDING CARTOGRAM – APR 9, 2016

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Fun With #SAS ODS Graphics: The United Polygons of America communities.sas.com/t5/SAS-GRAPH-a... #SASGF



Per Pupil Public Elementary/HS Spending By State (2013)

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City of Chicago: Annual Salary Distribution by Department

City of Chicago: 2015 Overtime/Supplemental Pay by Dept

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7:34 PM · Jan 28, 2017

NCAA BASKETBALL TOURNAMENT – MAR 9, 2017

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Fun With #SAS ODS Graphics: March Recursion Madness (Plotting a 64-Team #NCAA Tournament Bracket) #marchmadness communities.sas.com/t5/SAS-GRAPH-a...

1:09 AM · Mar 9, 2017

SUPER BOWL LI – FEB 7, 2017

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Fun With #SAS ODS Graphics: Generating #SuperBowl squares communities.sas.com/t5/SAS-GRAPH-a...

0	1	2	3	4	5	6	7	8	9
TESSA	ANNE	TESSA	JAMES	ANNE	SAM	KATE	RITA	GEORGE	WILLIAM
\$12	\$12	\$12	\$12	\$12	\$12	\$12	\$12	\$12	\$12
ANNE	LILLY	ANDREW	GEORGE	ANNE	SAM	RITA	MARTIN	SARAH	MARTIN
WILLIAM	WILLIAM	ANNE	TESSA	KATE	ANNE	TESSA	ANNE	ANNE	SAM
LILLY	LILLY	WILLIAM	SUSAN	SAM	SAM	SARAH	KATE	SUSAN	BILL
\$12	\$12	\$12	\$12	\$12	\$12	\$12	\$12	\$12	\$12
TESSA	TESSA	SAM	SUSAN	SARAH	SARAH	ANDREW	ANDREW	GEORGE	BILL
BILL	BILL	GEORGE	BILL	BILL	WILLIAM	TESSA	SARAH	KATE	BILL
JAMES	ANDREW	GEORGE	MARTIN	JAMES	SAM	KATE	MARTIN	SAM	RITA
BILL	ANDREW	SAM	TESSA	JAMES	GEORGE	ANDREW	ANDREW	ANDREW	SAM
LILLY	MARTIN	JAMES	ANNE	GEORGE	GEORGE	ANNE	TESSA	RITA	ANDREW
BILL	BILL	SUSAN	SUSAN	GEORGE	RITA	GEORGE	LILLY	TESSA	ANDREW
\$24	\$12								

NEW ENGLAND PATRIOTS

ATLANTA FALCONS

1:21 AM · Feb 7, 2017

SAS GLOBAL FORUM 2017 – MAR 26, 2017

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Fun w/#SAS ODS Graphics: #SASGF 1976-2020 Host Cities communities.sas.com/t5/SAS-GRAPH-a...

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Take 2!

SAS GLOBAL FORUM 2017 – APR 7, 2017

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No other nominees, so chances of winning Best Adapted #SASGF ePoster from a SAS Communities post are looking good! 😊 sascommunity.org/wiki/Retracing...

Retracing My SAS® Global Forum 2016 Steps with a Health App Step Data With a (What E...
Ted Conway, Chicago, IL
(Email: ted_j.conway@gmail.com, Twitter: @vivasasvegas)

HEALTH APP SAS ODS GRAPHICS STEP PLOT

MONDAY - APRIL 18 - 27,421 STEPS
TUESDAY - APRIL 19 - 16,858 STEPS
WEDNESDAY - APRIL 20 - 15,749 STEPS

12:12 AM · Apr 7, 2017

U.S. PRESIDENTS' HEIGHTS – APR 30, 2017

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Fun With #SAS ODS Graphics - All the Presidents' Heights communities.sas.com/t5/SAS-GRAPH-a-... #POTUS

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BASEBALL STAT DONUT CHARTS – APR 12, 2017

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Fun With #SAS ODS Graphics: All-Star Baseball-like Donut Charts communities.sas.com/t5/SAS-GRAPH-a-... #SASGF #CUBS

KRIS BRYANT
THIRD BASE

12:06 AM · Apr 12, 2017

MLB 2016 HOMER RUN LEADERS – JUN 4, 2017

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Fun w/#SAS ODS Graphics: Ch-ch-ch-Changes - Vector plots of YOY stats for #MLB 2016 home run leaders communities.sas.com/t5/SAS-GRAPH-a-...

	HR	BB	GP
Mark Trumbo	22 → 47 (114%)	15 → 51 (47.3%)	132 → 170 (28.9%)
Nelson Cruz	43 → 44 (1.2%)	3 → 42 (13.5%)	119 → 164 (13.5%)
Kyle Davis	15 → 42 (55.6%)	2 → 41 (4.5%)	122 → 143 (38.1%)
Brian Dozier	28 → 42 (50.0%)	0 → 41 (0%)	138 → 148 (6.4%)
Edwin Encarnacion	39 → 42 (7.7%)	77 → 87 (13.0%)	98 → 138 (28.8%)
Nolan Arenado	41 → 42 (2.4%)	34 → 58 (70.6%)	103 → 110 (6.4%)
Chris Carter	17 → 41 (58.8%)	19 → 76 (39.7%)	151 → 208 (36.4%)
Todd Frazier	5 → 40 (14.2%)	44 → 64 (43.8%)	137 → 163 (17.2%)
Kris Bryant	13 → 39 (50.2%)	75 → 77 (1.3%)	154 → 189 (22.7%)
Robinson Cano	18 → 39 (85.7%)	43 → 47 (9.3%)	100 → 107 (6.9%)

11:27 PM · Jun 4, 2017


1 Retweet 3 Likes

SGF Observer @vivasasvegas · Jun 6, 2017
Replying to @vivasasvegas

2017 AP EXAM SCORES – JUN 29, 2017

... 85% 9:07

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Fun With #SAS ODS Graphics: 5-4-3-2-1 #AP Exam Scores! communities.sas.com/t5/SAS-GRAPH-a...

1:00 AM · Jun 29, 2017

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TOTAL SOLAR ECLIPSE – AUG 19, 2017

... 85% 9:06

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Fun with #SAS ODS Graphics: Total #eclipse of the sun edition communities.sas.com/t5/SAS-GRAPH-a...

11:29 AM · Aug 19, 2017

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... 85% 9:06

FLAG OF SWEDEN – JUL 10, 2017

... 85% 9:06

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Inspired by Sunday morning's visit to #IKEA, a #SAS ODS Graphics band plot-take on the Flag of Sweden 😊 communities.sas.com/t5/SAS-GRAPH-a...

1:13 AM · Jul 10, 2017


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U.S. REFUGEE ADMISSIONS – OCT 6, 2017

... 85% 9:06

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Fun w/SAS ODS Graphics: There's more than one way to skin a #SAS dataviz communities.sas.com/t5/SAS-GRAPH-a...

U.S. Refugee Admissions by Region
Fiscal Year 1975 through Aug 31, 2017 (FY ends Sep 30)

... 85% 9:06

"THE DATASAUROUS DOZEN" – MAY 1, 2018

Tweet

SGF Observer @vivasasvegas

Fun With #SAS ODS Graphics: An SGPANEL Take On 'The Datasaurus Dozen' communities.sas.com/t5/SAS-GRAPH-a...

1:03 AM · May 1, 2018

CPS SALARY DISTRIBUTION – JUN 8, 2018

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Who makes more at the #ChicagoPublicSchools: Regular Teachers? Military Instructors? Nurses? Class 3 Engineers? Let's go to the box plot! communities.sas.com/t5/SAS-GRAPH-a... #sas

Job Title	Min	Q1	Q3	Max
Principal	84,400	104,000	114,000	130,000
Assistant Principal	66,000	74,000	84,000	94,000
Teacher-Career	36,000	44,000	54,000	64,000
School Psychologist	30,000	34,000	44,000	54,000
Behavior Specialist	26,000	30,000	34,000	44,000
School Nurse	24,000	28,000	34,000	44,000
Program Support Teacher	20,000	24,000	28,000	34,000
Special Education Teacher	18,000	22,000	28,000	34,000
Instructional Coach	16,000	20,000	24,000	30,000
Instructional Aide	14,000	18,000	22,000	28,000
Administrative Support	12,000	16,000	20,000	24,000
Classroom Aide	10,000	14,000	18,000	22,000
Teacher Assistant	8,000	12,000	16,000	20,000
Special Education Aide	6,000	10,000	14,000	18,000
Security Guard	4,000	6,000	8,000	10,000
Janitor	2,000	4,000	6,000	8,000
Food Service Worker	1,000	2,000	4,000	6,000
Bus Driver	1,000	2,000	4,000	6,000
Security Guard	1,000	2,000	4,000	6,000
Teacher Assistant	1,000	2,000	4,000	6,000
Class 3	1,000	2,000	4,000	6,000
Class 4	1,000	2,000	4,000	6,000
Class 5	1,000	2,000	4,000	6,000
Class 6	1,000	2,000	4,000	6,000
Class 7	1,000	2,000	4,000	6,000
Class 8	1,000	2,000	4,000	6,000
Class 9	1,000	2,000	4,000	6,000
Class 10	1,000	2,000	4,000	6,000
Class 11	1,000	2,000	4,000	6,000
Class 12	1,000	2,000	4,000	6,000
Class 13	1,000	2,000	4,000	6,000
Class 14	1,000	2,000	4,000	6,000
Class 15	1,000	2,000	4,000	6,000
Class 16	1,000	2,000	4,000	6,000
Class 17	1,000	2,000	4,000	6,000
Class 18	1,000	2,000	4,000	6,000
Class 19	1,000	2,000	4,000	6,000
Class 20	1,000	2,000	4,000	6,000
Class 21	1,000	2,000	4,000	6,000
Class 22	1,000	2,000	4,000	6,000
Class 23	1,000	2,000	4,000	6,000
Class 24	1,000	2,000	4,000	6,000
Class 25	1,000	2,000	4,000	6,000
Class 26	1,000	2,000	4,000	6,000
Class 27	1,000	2,000	4,000	6,000
Class 28	1,000	2,000	4,000	6,000
Class 29	1,000	2,000	4,000	6,000
Class 30	1,000	2,000	4,000	6,000
Class 31	1,000	2,000	4,000	6,000
Class 32	1,000	2,000	4,000	6,000
Class 33	1,000	2,000	4,000	6,000
Class 34	1,000	2,000	4,000	6,000
Class 35	1,000	2,000	4,000	6,000
Class 36	1,000	2,000	4,000	6,000
Class 37	1,000	2,000	4,000	6,000
Class 38	1,000	2,000	4,000	6,000
Class 39	1,000	2,000	4,000	6,000
Class 40	1,000	2,000	4,000	6,000

8:15 PM · Jun 8, 2018

1 Like

CANCER SURVIVAL SLOPEGRAPH – MAY 29, 2018

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A #SAS ODS Graphics "remix" of @EdwardTufts's cancer survival slopegraph communities.sas.com/t5/SAS-GRAPH-a...

5 year 10 year 15 year 20 year

Prostate 99 96 94 95
Thyroid 96 95 94 95
Testis 95 94 94 95
Melanomas 89 87 87 88
Breast 86 87 87 88
Hodgkin's disease 85 84 84 85
Corpus uteri, uterus 84 83 83 84
Urinary, bladder 82 80 81 81
Cervix, uteri 71 71 71 74
Larynx 69 69 70 68
Rectum 68 67 67 65
Kidney, renal pelvis 65 64 63 60
Colon 63 64 63 60
Non-Hodgkin's 58 57 57 52
Oral cavity, pharynx 57 54 54 52
Ovary 53 52 52 50
Rectum 49 48 48 50
Kidney, renal pelvis 47 46 46 47
Larynx 46 44 44 38
Leukemia 43 44 44 38
Brain, nervous system 32 32 32 34
Multiple myeloma 30 29 30 33

WI-IL SAS USERS CONFERENCE – SEP 3, 2018

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SGF Observer @vivasasvegas

data; retain l "#WIILSU Conference - June 20 - Milwaukee" x -87.901535 y 43.042481; proc sgmap plotdata=_last_; openstreetmap; scatter x=y / datalabel=l datalabelattr=(size=18pt) datalabelpos=top markerattr=(size=18pt symbol=circlefilled); * wiilsu.org/NextConference... #sas;

#WIILSU Conference - June 20 - Milwaukee

2:43 PM · Jun 10, 2018

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WHY SAS ODS GRAPHICS?

WHY SHOULD I LEARN SAS ODS GRAPHICS?

So, why learn SAS ODS Graphics – aren't your current methods of producing charts good enough?



Photo Credit: [Harris & Ewing](#)

Well, among other things, SAS ODS Graphics:

- Provides an easy-to-use, flexible, and rich feature set for data visualization
- Facilitates the automation of chart creation, promoting reproducible and repeatable results
- Scales, allowing you to produce dozens, hundreds, or even thousands of charts with a consistent look
- Enables you to create precisely-sized and formatted charts when needed
- Is fully-integrated with SAS, giving you access to all the powerful analytic and data transformation features of SAS software, so you can get your data chart-ready in no time!

The procedures and statements support the creation of a wealth of single and multiple panel charts.

- PROCs **SGPLOT**, **SGPANEL**, **SGSCATTER**, **SGMAP** (*new!*) are used to produce “standard” graphs.
- **GTL** (Graph Template Language) can be used with PROC **SGRENDER** to make custom graphs.
- The **SGDESIGN** PROC produces charts from SAS data sets and user-defined ODS Graphics Designer (SGD) files, which are created with the **SAS ODS Graphics Designer** GUI application.

Chart types that can be produced using SAS ODS Graphics include the following:

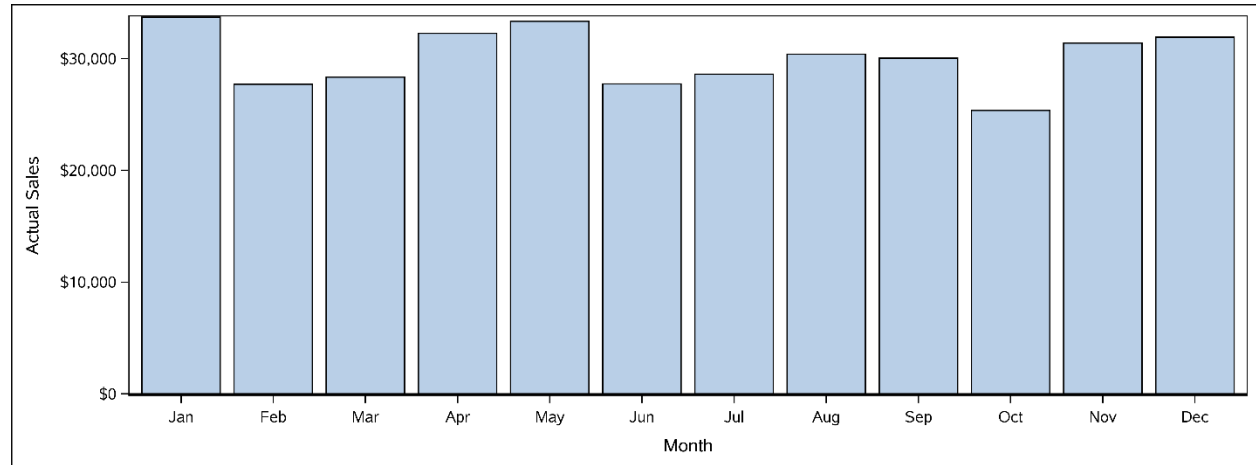
✓ Bar Charts (Vertical, Horizontal, Grouped, Stacked)	✓ Multi-Panel Charts (SGPANEL, SGSCATTER)	✓ Mosaic Charts
✓ Scatter Plots (Including Grouped)	✓ High-low Plots	✓ Pie Charts
✓ Histograms	✓ Needle Charts	✓ Surface Plots
✓ Line Charts (Including Series)	✓ Vector Charts	✓ Text Plots
✓ Step Charts	✓ Basic REG Plots	✓ Band Plots
✓ Bubble Charts	✓ Dot Plots	✓ Fringe Plots
✓ Waterfall Charts	✓ Box Pots (Vertical, Horizontal)	✓ Maps (SGMAP, Polygon)
	✓ Heat maps	✓ GTL-Based Chart Composites

Other statements and options that enhance the appearance of charts – e.g., labels, axis options (including data tables), reference lines, colors, legends, font family/size/weight, transparency, bands, annotation, markers, insets, symbols, attribute maps, drawtext – are also available.

HELLO, BAR CHART!

So, where can you find examples of SAS ODS Graphics? Well, the [SAS 9.4 ODS Graphics: Procedures Guide](#) is a great resource, but weighs in at 1,652 pages, so let's start with a simple SAS ODS Graphics take on a "Hello, World!" Program to illustrate just how easy it can be to create a chart from your data.

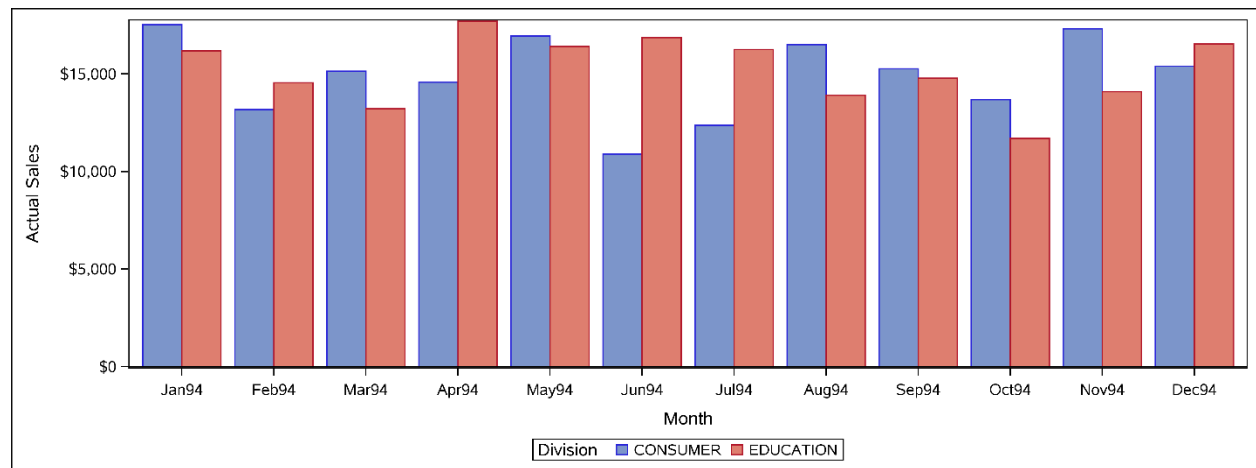
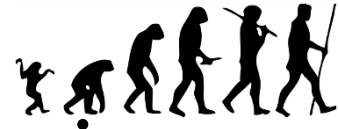
```
proc sgplot data=sashelp.prdsale;
vbar month / response=actual;
where year(month)=1994;
```



SASHELP.PRDSALE – 1994 Actual Sales by Month – Ungrouped Bar Chart

Want to go beyond the default? No problem! Luckily, SAS took Alan Kay's famous credo – "*Simple things should be simple, complex things should be possible.*" – to heart, so you can "evolve" the look-and-feel of charts to your heart's content – here are two different takes on the same data as our last example.

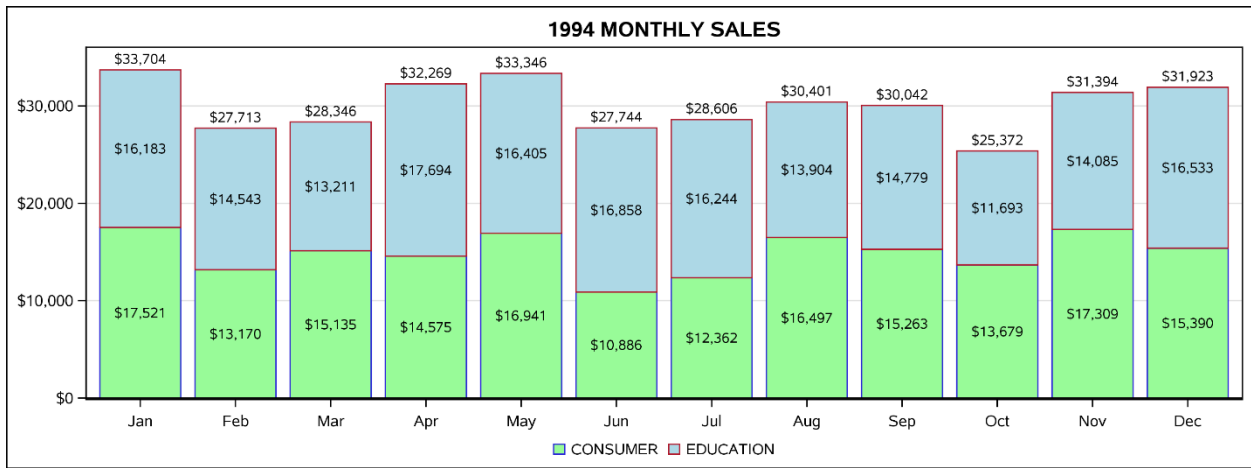
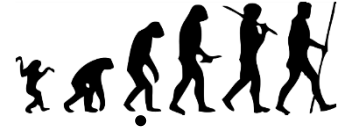
```
proc sgplot data=sashelp.prdsale;
vbar month / response=actual group=division groupdisplay=cluster;
where year(month)=1994;
format month monyy5.;
```



SASHELP.PRDSALE – 1994 Actual Sales by Month – Clustered Group Bar Chart
Illustration Credit: [José-Manuel Benitos](#)

Below, we've opted for a stacked bar chart presentation, and used various SAS ODS Graphics options to not only enhance the default appearance, but also to increase the amount of information presented to the viewer.

```
proc sgplot data=sashelp.prdsale(where=(year(month)=1994));
styleattrs datacolors=(palegreen lightblue);
title height=12pt "1994 MONTHLY SALES";
vbar month / response=actual group=division
          datalabel datalabelattrs=(size=8.5pt)
          seglabel seglabelformat=dollar9. seglabelattrs=(size=8.5pt);
axis display=(nolabel);
yaxis display=(nolabel) grid;
keylegend / title="" noborder;
format actual dollar9. month monname3.;
```



SASHELP.PRDSALE – 1994 Actual Sales by Month – Stacked Group Bar Chart