SAS in IR:

Behind the scenes tips and tricks

UCI Office of Institutional Research

CAIR 2016

Wednesday, November 16th 3:45 – 4:30

About the University of California, Irvine

- Established in 1965.
- 87 undergraduate degree programs, 59 master's, and 46 Ph.D. programs, with over 8,700 degrees awarded in 2014-15.
- Association of American Universities member.
- Over 30,000 students and more than 15,000 non-student employees.

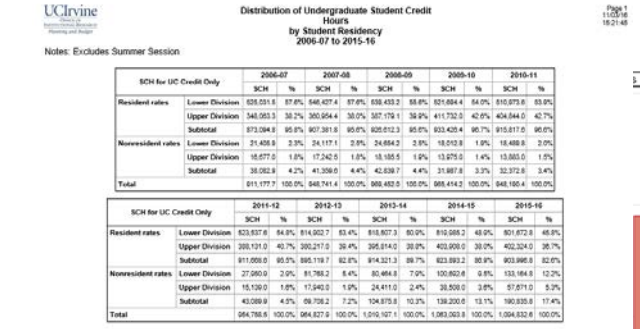
- Ranked #1 in 2015 by *The New York Times* among U.S. universities that do the most for low-income students; our undergraduates are 29% URM, 50% 1st generation, and 35% low-income.
- Ranked in the top 10 of public universities by *U.S. News & World Report*
- A four year graduation rate of over 70%.

About us…

- Ryan Cherland
  - Assistant Vice Chancellor for Institutional Research and Decision-Support.
  - Involved in Institutional Research starting in 1985 as a graduate assistant, working at five different institutions over those thirty years.
  - Started using SAS in the early 1980s.
- Joshua Saldana
  - Principal Research Analyst
  - Three years of experience across two offices and two years of working with SAS
- Aliana Flores
  - Statistical and Information Coordinator
  - Over five years of experience in Institutional Research and three years working with SAS Software.

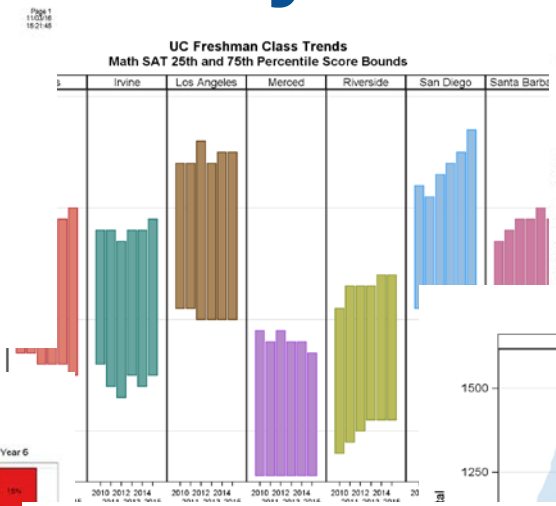
Why SAS?

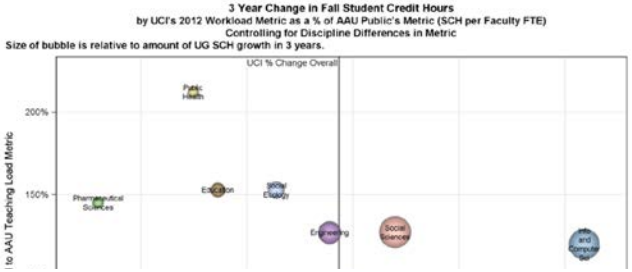
Why SAS?

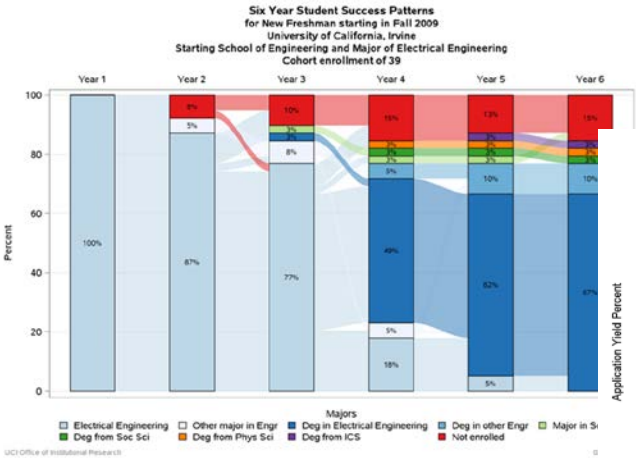

UCIrvine
Distribution of Undergraduate Student Credit Hours
by Student Residency
2006-07 to 2015-16
Notes: Excludes Summer Session

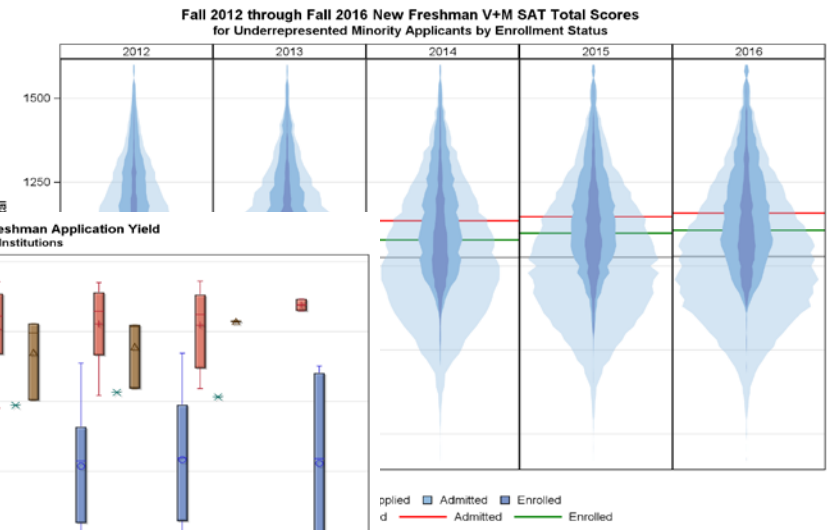
SCH for UC Credit Only		2006-07		2007-08		2008-09		2009-10		2010-11	
		SCH	%	SCH	%	SCH	%	SCH	%	SCH	%
Resident rates	Lower Division	526,531.5	57.6%	546,427.4	57.6%	539,433.2	56.6%	521,694.4	54.0%	510,973.6	53.0%
	Upper Division	346,063.3	38.2%	360,954.4	38.0%	367,179.1	38.9%	411,732.0	42.6%	404,644.0	42.7%
	Subtotal	873,094.8	95.8%	907,381.8	95.6%	925,612.3	95.6%	933,426.4	96.7%	915,617.6	95.6%
Nonresident rates	Lower Division	21,406.9	2.3%	24,117.1	2.5%	24,664.2	2.5%	18,012.8	1.9%	18,488.8	2.0%
	Upper Division	16,677.0	1.8%	17,242.5	1.8%	18,185.5	1.9%	13,975.0	1.4%	13,883.0	1.5%
	Subtotal	38,082.9	4.2%	41,359.6	4.4%	42,839.7	4.4%	31,987.8	3.3%	32,372.8	3.4%
Total		911,177.7	100.0%	948,741.4	100.0%	968,452.0	100.0%	965,414.2	100.0%	948,190.4	100.0%

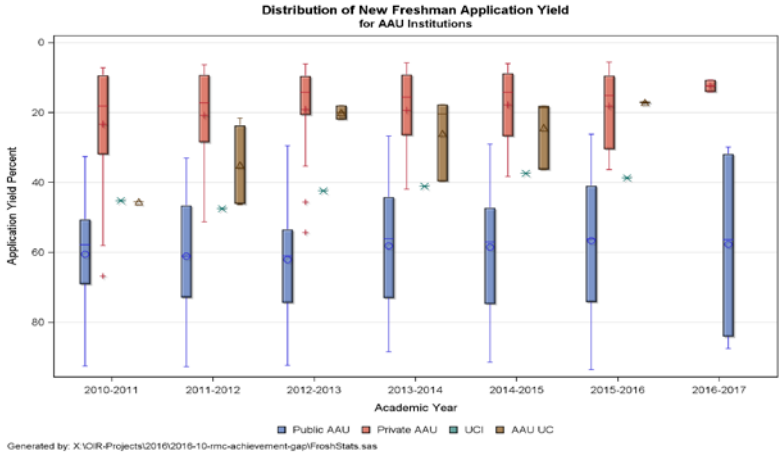
SCH for UC Credit Only		2011-12		2012-13		2013-14		2014-15		2015-16	
		SCH	%	SCH	%	SCH	%	SCH	%	SCH	%
Resident rates	Lower Division	523,837.8	54.8%	514,902.7	53.4%	518,807.3	50.0%	510,985.2	48.9%	501,672.8	45.8%
	Upper Division	388,131.0	40.7%	380,217.0	39.4%	395,514.0	38.0%	403,908.0	38.0%	402,324.0	36.7%
	Subtotal	911,968.8	95.5%	895,119.7	92.8%	914,321.3	88.1%	823,893.2	86.9%	903,996.8	82.6%
Nonresident rates	Lower Division	27,980.9	2.9%	51,788.2	5.4%	80,464.8	7.8%	100,602.4	9.5%	133,184.8	12.2%
	Upper Division	15,139.0	1.6%	17,940.0	1.9%	24,411.0	2.4%	38,508.0	3.6%	57,871.0	5.3%
	Subtotal	43,089.9	4.5%	69,708.2	7.2%	104,875.8	10.3%	139,200.6	13.1%	190,835.8	17.4%
Total		954,788.5	100.0%	964,827.9	100.0%	1,019,197.1	100.0%	1,063,093.8	100.0%	1,094,832.6	100.0%











Why SAS?

Presentation Overview

- Setting up SAS resources to help maintain an IR office identity.
- Data management and enhancement of institutional data resources
- Geocoding / HTML click maps / ODS PDF reports
- Useful Resources to learn more

Benefits of setting up Shared resources for your IR office

- One location to manage:
  - Useful macros
  - An office ODS styles and templates
  - Makes it easy update / change to a new "brand" when needed.

Steps to setup shared resources

- Determine location on office network drive
- Create folder structures for macros, shared style templates, setup programs, etc.
  - X:\SAS\macros
  - X:\SAS\Setups
  - X:\SAS\Examples

Start with your “autoexec.sas” file…

- Look at the bottom of your SAS Window environment, that is where SAS starts up:

- If you put a “autoexec.sas” file there with SAS code, it will run the code at each initialization

Start with the local “autoexec.sas” file…

```
/* An example SAS Autoexec file */
/* First, bring in a central office setup file */
%inc "X:\SAS\macros\OIRautoexec.sas";
%put Initializing my settings...;
/* Include any individual setups */
%inc "C:\Users\&sysuserid\Documents\MySAS\sassetups.sas";
```

Code that might be in a Shared setup file…

```
1  /* OIR common Autoexec file -- do not edit without checking with RMC */
2  %*;
3  %put Initializing OIR common environment...;
4  filename _oirsys 'X:\SAS\macros';
5  filename _oirutl 'X:\SAS\macros\util';
6  %*;
7  options sasautos=(_oirsys _oirutl SASAUTOS);
8  %*;
9  libname _oir '\\128.200.163.243\share\SAS\macros';
10 %*;
11 data _null_;
12  if "&sysver" ge '9.4' then call execute('ods path (prepend) _oir.templat94b(read) _oir.templat94(read);');
13 else if "&sysver" le '9.3' then call execute('ods path (prepend) _oir.templat(read);');
14 run;
15 *;
16 ods results off;
17
```

SAS Log from running Shared setup…

Log - (Untitled)

```
      SAS/IML 14.1
      SAS/QC 14.1

NOTE: Additional host information:

 X64_7PRO WIN 6.1.7601 Service Pack 1 Workstation

NOTE: SAS initialization used:
      real time               6.69 seconds
      cpu time                0.59 seconds


NOTE: AUTOEXEC processing beginning; file is C:\Users\rcherlan\autoexec.sas.

Initializing OIR common environment...
NOTE: Libref _OIR was successfully assigned as follows:
      Engine:        V9
      Physical Name: X:\SAS\macros

NOTE: DATA statement used (Total process time):
      real time               0.38 seconds
      cpu time                0.00 seconds


NOTE: CALL EXECUTE generated line.
1    + ods path (prepend) _oir.templat94(read);
Initializing my settings...

NOTE: AUTOEXEC processing completed.
```

Now that you have a common location, create some shared resources

First, an ODS style template for reports

Note: Code samples will be available on our website.

Style_OIR.sas

```
1  /*************************************************************
2  *************************************************************
3  **            Office of Institutional Research             **
4  **                       SAS Program                       **
5  **  ------------------------------------------------------  **
6  ** Description:                                            **
7  **  OIR Formal report style for RTF and PDF ODS report    **
8  **  output.                                                **
9  **  ------------------------------------------------------  **
10 ** Created: 01/22/13                        By: R Cherland  **
11 *************************************************************
12 *************************************************************/
13 libname _oir 'X:\SAS\macros';
14 *;
15 ods path _oir.templat94(update) sashelp.tmplmst(read);
16 *;
17 proc template;
18    define style Oir / store = _oir.TEMPLAT94;
19       parent = styles.listing;
20       style fonts /
21          'TitleFont2' = ("Arial, Helvetica",10pt)
22          'TitleFont' = ("Arial, Helvetica",11pt)
23          'StrongFont' = ("Arial, Helvetica",9pt,bold)
24          'EmphasisFont' = ("Arial, Helvetica",9pt,italic)
25          'FixedEmphasisFont' = ("Courier",8pt,italic)
26          'FixedStrongFont' = ("Courier",8pt,bold)
```

Provide useful macros, here is one that identifies the network path and name "stem" of the running program for use in naming output:

outpath.sas

```
1  /* When you do not want to type in the pathname for your output report. The extention parameter allows
2     you to add numbers or letters after the main name segment in those cases where multiple reports are
3     being generated by the program.  Created 1/24/07  R. Cherland */
4  %macro outpath(ext);
5   %if %symexist(_SASPROGRAMFILE) %then %unquote(%str(%')%substr(%sysget(_SASPROGRAMFILE),1,%length(%sysg
6  %else %unquote(%str(%')%substr(%sysget(SAS_EXECFILEPATH),1,%length(%sysget(SAS_EXECFILEPATH))-4)&ext%st
7  %mend outpath;
```

```
91  ods _all_ close;
92  options orientation=Landscape papersize=letter;
93  ods rtf body=%outpath(_&sysdate..rtf) style=oir;
```

And one that sets up an office "title" framework and stamps as a footnote the output with the SAS program name that created the output:

```
31  %let image=X:\SAS\Setups\OIR_logo300.jpg;
32  title1 j=l h=8pt "(*ESC*)S={preimage='&image'}"
33         j=c h=11pt "(*ESC*)S={fontweight=BOLD}&ttl1(*ESC*)n&ttl2(*ESC*)n&ttl3"
34         j=r h=8pt "(*ESC*)S={fontweight=MEDIUM}&right1(*ESC*)n&right2(*ESC*)n&right3";
35  footnote1 j=l h=8pt "Generated by: &path.&prog";
36  %*;
37  options nodate nonumber;
38  %mend UCFORMAL;
```

```
94  %ucformal(Distribution of Undergraduate Student Credit Hours,
95            by Student Residency,
96            2006-07 to 2015-16);
97  title2 j=l 'Notes: Excludes Summer Session';
98  proc tabulate data=rpt missing;
```

Example output using office style and title macro

UCIrvine
Office of Institutional Research
Planning and Budget

Distribution of Undergraduate Student Credit Hours
by Student Residency
2006-07 to 2015-16

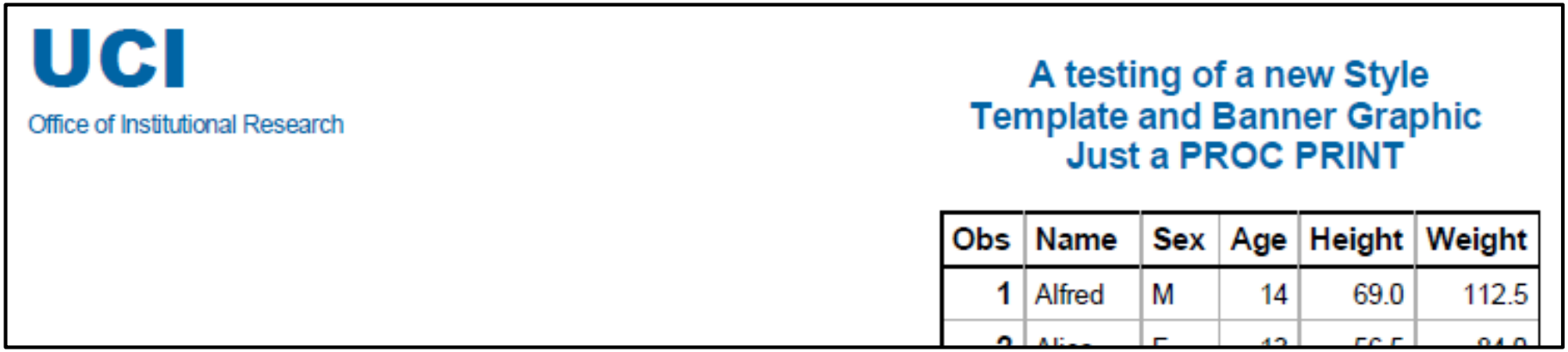
Page 1
11/03/16
15:21:45

Notes: Excludes Summer Session

SCH for UC Credit Only		2006-07		2007-08		2008-09		2009-10		2010-11	
		SCH	%	SCH	%	SCH	%	SCH	%	SCH	%
Resident rates	Lower Division	525,031.5	57.6%	546,427.4	57.6%	539,433.2	55.6%	521,694.4	54.0%	510,973.6	53.9%
	Upper Division	348,063.3	38.2%	360,954.4	38.0%	387,179.1	39.9%	411,732.0	42.6%	404,844.0	42.7%
	Subtotal	873,094.8	95.8%	907,381.8	95.6%	926,612.3	95.6%	933,426.4	96.7%	915,817.6	96.6%
Nonresident rates	Lower Division	21,405.9	2.3%	24,117.1	2.5%	24,654.2	2.5%	18,012.8	1.9%	18,489.8	2.0%
	Upper Division	16,677.0	1.8%	17,242.5	1.8%	18,185.5	1.9%	13,975.0	1.4%	13,883.0	1.5%
	Subtotal	38,082.9	4.2%	41,359.6	4.4%	42,839.7	4.4%	31,987.8	3.3%	32,372.8	3.4%
Total		911,177.7	100.0%	948,741.4	100.0%	969,452.0	100.0%	965,414.2	100.0%	948,190.4	100.0%

SCH for UC Credit Only		2011-12		2012-13		2013-14		2014-15		2015-16	
		SCH	%	SCH	%	SCH	%	SCH	%	SCH	%
Resident rates	Lower Division	523,537.6	54.8%	514,902.7	53.4%	518,507.3	50.9%	519,985.2	48.9%	501,672.8	45.8%
	Upper Division	388,131.0	40.7%	380,217.0	39.4%	395,814.0	38.8%	403,908.0	38.0%	402,324.0	36.7%
	Subtotal	911,668.6	95.5%	895,119.7	92.8%	914,321.3	89.7%	923,893.2	86.9%	903,996.8	82.6%
Nonresident rates	Lower Division	27,950.9	2.9%	51,768.2	5.4%	80,464.8	7.9%	100,692.6	9.5%	133,164.8	12.2%
	Upper Division	15,139.0	1.6%	17,940.0	1.9%	24,411.0	2.4%	38,508.0	3.6%	57,671.0	5.3%
	Subtotal	43,089.9	4.5%	69,708.2	7.2%	104,875.8	10.3%	139,200.6	13.1%	190,835.8	17.4%
Total		954,758.5	100.0%	964,827.9	100.0%	1,019,197.1	100.0%	1,063,093.8	100.0%	1,094,832.6	100.0%

As Campus “branding” changes, you can adjust you macro code and Style templates to line it up with the new font and color themes…



IR also has challenging data management tasks that come up,

Josh will discuss how SAS features can help with those next...

Wrangling Data with SAS

Rankings

BEST COLLEGES U.S.News & WORLD REPORT RANKINGS

Kiplinger

TIMES HIGHER EDUCATION THE WORLD UNIVERSITY RANKINGS

THE WALL STREET JOURNAL.

ACADEMIC RANKING OF WORLD UNIVERSITIES
ACADEMIC RANKING OF WORLD UNIVERSITIES SINCE 2003

Name Variations*

- UCI
- UC Irvine
- U-Cal Irvine
- Cal-Irvine
- University of California, Irvine
- University of California-Irvine
- Univ of California (Irvine)
- Univ. of California, Irvine CA

*partial list

Why SAS?

- Over STATA or SPSS
- Over R or Python

Typical Rankings Data

NTU Ranking
Performance Ranking of Scientific Papers for World Universities

World Rank	Country Rank	University	Total Score hide	11 Years Articles	Current Articles	11 Years Citations	Current Citations	Ave. Citations	H-Index	HiCi Papers	Hi-Impact Journal Articles	Ref. Rank (normalized by number of faculty)
1	1	Harvard University	98.1	100.0	100.0	100.0	100.0	81.3	100.0	100.0	100.0	1
2	2	Stanford University	93.1	86.2	89.7	97.1	100.0	75.1	89.7	100.0	100.0	2
3	3	Johns Hopkins University	92.9	91.5	92.8	100.0	98.9	72.6	86.3	96.0	97.6	4
6	4	University of Washington, Seattle	90.0	87.8	86.2	95.2	94.5	71.7	83.5	99.2	94.5	5
7	5	University of California, Berkeley	88.3	82.2	81.1	91.4	95.8	74.0	84.9	99.6	92.3	6
8	6	University of Michigan, Ann Arbor	88.0	92.6	90.7	93.5	89.9	66.0	76.6	90.7	95.2	12
9	7	Massachusetts Institute of Technology	87.6	75.6	74.7	93.4	90.1	85.4	84.9	100.0	91.6	2
10	8	University of California, Los Angeles	86.7	88.1	84.0	95.1	85.2	71.3	78.0	93.5	90.6	8

Exported

	A	B	C	D
1	World Rank	Country Rank	University	Total Score
2	1	1	Harvard University	98.1
3	2	2	Stanford University	93.1
4	3	3	Johns Hopkins University	92.9
5	6	4	University of Washington, Seattle	90
6	7	5	University of California, Berkeley	88.3
7	8	6	University of Michigan, Ann Arbor	88
8	9	7	Massachusetts Institute of Technology	87.6
9	10	8	University of California, Los Angeles	86.7

IPEDS Raw Data

hd2013.csv

```
1  UNITID,INSTNM,ADDR,CITY,STABBR,ZIP,FIPS,OBEREG,CHFNM,CHFTITLE,GENTELE,FAXTELE,EIN,OPEID,O
   PEFLAG,WEBADDR,ADMINURL,FAIDURL,APPLURL,NPRICURL,SECTOR,ICLEVEL,CONTROL,HLOFFER,UGOFFER,G
   ROFFER,HDEGOFR1,DEGGRANT,HBCU,HOSPITAL,MEDICAL,TRIBAL,LOCALE,OPENPUBL,ACT,NEWID,DEATHYR,C
   LOSEDAT,CYACTIVE,POSTSEC,PSEFLAG,PSET4FLG,RPTMTH,IALIAS,INSTCAT,CCBASIC,CCIPUG,CCIPGRAD,C
   CUGPROF,CCENRPRF,CCSIZSET,CARNEGIE,LANDGRNT,INSTSIZE,CBSA,CBSATYPE,CSA,NECTA,F1SYSTYP,F1S
   YSNAM,F1SYSCOD,COUNTYCD,COUNTYNM,CNGDSTCD,LONGITUD,LATITUDE,DFRCGID,DFRCUSCG
2  100654,"Alabama A & M University","4900 Meridian Street","Normal","AL","35762", 1,
   5,"Dr. Andrew Hugine,
   Jr.","President","2563725000","2563725030","636001109","00100200",1,"www.aamu.edu/","www.
   aamu.edu/admissions/pages/default.aspx","www.aamu.edu/Admissions/fincialaid/Pages/default
   .aspx","www.aamu.edu/Admissions/apply/Pages/default.aspx","galileo.aamu.edu/netpricecalcu
   lator/npcalc.htm",1,1,1,9,1,1,12,1,1,2,2,2,12,1,"A
   ",-2,-2,"-2",1,1,1,1,1,"AAMU",2,18,13,18,9,4,14,16,1,3,26620,1,290,-2,2,"
   ","-2",1089,"Madison County",105,-86.568502,34.783368,138,1
3  100663,"University of Alabama at Birmingham","Administration Bldg Suite
   1070","Birmingham","AL","35294-0110", 1, 5,"Ray L.
   Watts","President","2059344011","2059757114","636005396","00105200",1,"www.uab.edu","www.
   uab.edu/students/undergraduate-admissions","www.uab.edu/students/paying-for-college","ssb
   .it.uab.edu/pls/sctprod/zsapk003_ug_web_appl.create_page","www.collegeportraits.org/AL/UA
   B/estimator/agree",1,1,1,9,1,1,11,1,2,1,1,2,12,1,"A ",-2,-2,"-2",1,1,1,1,1,"
   ",2,15,11,17,8,5,15,15,2,4,13820,1,142,-2,1,"The University of Alabama
```

Has SAS Code

hd2013.sas

```
16  ***                                                          ***;
17  *** This program does not include reserved values in its     ***;
18  *** calculations for missing values.  ***;
19  ***                                                          ***;
20  *** There may be missing data for some institutions due      ***;
21  *** to the merge used to create this file.                   ***;
22  Data HD_2013A;
23  infile 'X:\OIR-Projects\2015\2015-05-js-school-codes\IPEDS Codes\Data\hd2013.csv'  delimiter=',' DSD MISSOVER firstobs=2 lrecl=32736;
24
25  informat
26  unitid   6.
27  instnm   $120.
28  addr     $100.
29  city     $30.
30  stabbr   $2.
31  zip      $10.
32  fips     2.
33  obereg   2.
34  chfnm    $50.
35  chftitle $50.
36  gentele  $15.
37  faxtele  $15.
38  ein      $9.
39  opeid    $8.
40  opeflag  1.
41  webaddr  $150.
42  adminurl $200.
43  faidurl  $200.
44  applurl  $200.
45  npricurl $200.
46  sector   2.
47  iclevel  2.
48  control  2.
```

A little cleaner

VIEWTABLE: Work.Hd_2013a

	unitid	instnm	city	addr	zip	
1	100654	Alabama A & M University	Normal	4900 Meridian Street	35762	Alabama
2	100663	University of Alabama at Birmingham	Birmingham	Administration Bldg Suite 1070	35294-0110	Alabama
3	100690	Amridge University	Montgomery	1200 Taylor Rd	36117-3553	Alabama
4	100706	University of Alabama in Huntsville	Huntsville	301 Sparkman Dr	35899	Alabama
5	100724	Alabama State University	Montgomery	915 S Jackson Street	36104-0271	Alabama
6	100733	University of Alabama System Office	Tuscaloosa	401 Queen City Ave	35401	Alabama
7	100751	The University of Alabama	Tuscaloosa	739 University Blvd	35487-0166	Alabama
8	100760	Central Alabama Community College	Alexander City	1675 Cherokee Rd	35010	Alabama
9	100812	Athens State University	Athens	300 N Beaty St	35611	Alabama

A sampling of the character functions

Function	Sample
LENGTH	UC Irvine vs UC Irvin

A sampling of the character functions

Function	Sample
LENGTH	UC Irvine vs UC Irvin
LOWCASE,UPCASE,PROPCASE	UC Irvine -> uc irvine

A sampling of the character functions

Function	Sample
LENGTH	UC Irvine vs UC Irvin
LOWCASE,UPCASE,PROPCASE	UC Irvine -> uc irvine
SCAN, FIND, SUBSTR, TRIM,STRIP	UC Irvine -> Irvine

A sampling of the character functions

Function	Sample
LENGTH	UC Irvine vs UC Irvin
LOWCASE,UPCASE,PROPCASE	UC Irvine -> uc irvine
SCAN, FIND, SUBSTR, TRIM,STRIP	UC Irvine -> Irvine
PRXPARSE, PRXMATCH	“University of California” vs “California State University”

A sampling of the character functions

Function	Sample
LENGTH	UC Irvine vs UC Irvin
LOWCASE,UPCASE,PROPCASE	UC Irvine -> uc irvine
SCAN, FIND, SUBSTR, TRIM,STRIP	UC Irvine -> Irvine
PRXPARSE, PRXMATCH	“University of California” vs “California State University”

White space

End of line.

A sampling of the character functions

Function	Sample
LENGTH	UC Irvine vs UC Irvin
LOWCASE,UPCASE,PROPCASE	UC Irvine -> uc irvine
SCAN, FIND, SUBSTR, TRIM,STRIP	UC Irvine -> Irvine
PRXPARSE, PRXMATCH	“University of California” vs “California State University”
COMPRESS,TRANWRD,COMPBL	UC Irvine -> UCIrvine

A sampling of the character functions

Function	Sample
LENGTH	UC Irvine vs UC Irvin
LOWCASE,UPCASE,PROPCASE	UC Irvine -> uc irvine
SCAN, FIND, SUBSTR, TRIM,STRIP	UC Irvine -> Irvine
PRXPARSE, PRXMATCH	“University of California” vs “California State University”
COMPRESS,TRANWRD,COMPBL	UC Irvine -> UCIrvine
CATT,CATS,CATX	UC Irvine -> UC Irvine CA

A sampling of the character functions

Function	Sample
LENGTH	UC Irvine vs UC Irvin
LOWCASE,UPCASE,PROPCASE	UC Irvine -> uc irvine
SCAN, FIND, SUBSTR, TRIM,STRIP	UC Irvine -> Irvine
PRXPARSE, PRXMATCH	“University of California” vs “California State University”
COMPRESS,TRANWRD,COMPBL	UC Irvine -> UCIrvine
CATT,CATS,CATX	UC Irvine -> UC Irvine CA
SPEDIT,COMPGED	University of California Irvine vs UC Irvine

```
%macro collegenameedit(schoolname);

schoolname_edit=lowcase(&schoolname);
schoolname_edit=scan(schoolname_edit,1,"(");
```

Before	After
The Pennsylvania State University-Main Campus (University Park)	the pennsylvania state university-main campus

```
schoolname_edit_new1=Tranwrd(schoolname_edit,"the ","");
schoolname_edit_new1=Tranwrd(schoolname_edit,“-main campus"," ");
```

the pennsylvania state university-main campus	**pennsylvania state university**

```
schoolname_edit=Compress(schoolname_edit,,'sp');
```

the pennsylvania state university	**pennsylvaniastateuniversity**

```
schoolname_editCity=cats(schoolname_edit, lowcase(city));
```

the pennsylvania state university	**pennsylvaniastateuniversityuniversitypark**

```
UNIV= PRXPARSE("/university$/i");
UNIV_INDEX = PRXMATCH(coll,strip(&schoolname));

if COLL_INDEX ne 0 or COLLSP_INDEX then coll_change=
tranwrd(schoolname_edit," university",“univ");
else coll_change=schoolname_edit;

%mend collegenameedit;
```

Before	After
Pennsylvania state university	**pennsylvania state univ**

```
data ipeds; set Hd_2013a ;
%collegenameedit(instnm);
run;
```

The first output

unitid	instnm	schoolname_edit	univ_change	schoolname_edit_arts
100654	Alabama A & M University	alabamaamuniversity	alabamaamuniv	alabamaamuniversity
100663	University of Alabama at Birmingham	universityofalabamaatbirmingham	universityofalabamaatbirmingham	universityalabamabirmingham
100690	Amridge University	amridgeuniversity	amridgeuniv	amridgeuniversity
100706	University of Alabama in Huntsville	universityofalabamainhuntsville	universityofalabamainhuntsville	universityalabamainhuntsville
100724	Alabama State University	alabamastateuniversity	alabamastateuniv	alabamastateuniversity
100751	The University of Alabama	theuniversityofalabama	theuniversityofalabama	universityalabama
100760	Central Alabama Community College	centralalabamacommunitycollege	centralalabamacommunitycollege	centralalabamacommunitycollege
100812	Athens State University	athensstateuniversity	athensstateuniv	athensstateuniversity

The first output

unitid	instnm	schoolname_edit	univ_change	schoolname_edit_arts
100654	Alabama A & M University	alabamaamuniversity	alabamaamuniv	alabamaamuniversity
100663	University of Alabama at Birmingham	universityofalabamaatbirmingham	universityofalabamaatbirmingham	universityalabamabirmingham
100690	Amridge University	amridgeuniversity	amridgeuniv	amridgeuniversity
100706	University of Alabama in Huntsville	universityofalabamainhuntsville	universityofalabamainhuntsville	universityalabamainhuntsville
100724	Alabama State University	alabamastateuniversity	alabamastateuniv	alabamastateuniversity
100751	The University of Alabama	theuniversityofalabama	theuniversityofalabama	universityalabama
100760	Central Alabama Community College	centralalabamacommunitycollege	centralalabamacommunitycollege	centralalabamacommunitycollege
100812	Athens State University	athensstateuniversity	athensstateuniv	athensstateuniversity

The first output

unitid	instnm	schoolname_edit	univ_change	schoolname_edit_arts
100654	Alabama A & M University	alabamaamuniversity	alabamaamuniv	alabamaamuniversity
100663	University of Alabama at Birmingham	universityofalabamaatbirmingham	universityofalabamaatbirmingham	universityalabamabirmingham
100690	Amridge University	amridgeuniversity	amridgeuniv	amridgeuniversity
100706	University of Alabama in Huntsville	universityofalabamainhuntsville	universityofalabamainhuntsville	universityalabamainhuntsville
100724	Alabama State University	alabamastateuniversity	alabamastateuniv	alabamastateuniversity
100751	The University of Alabama	theuniversityofalabama	theuniversityofalabama	universityalabama
100760	Central Alabama Community College	centralalabamacommunitycollege	centralalabamacommunitycollege	centralalabamacommunitycollege
100812	Athens State University	athensstateuniversity	athensstateuniv	athensstateuniversity

The Crosswalk

unitid	instnm	InstNameMatch
100654	Alabama A & M University	alabamaamuniv
100654	Alabama A & M University	alabamaamunival
100654	Alabama A & M University	alabamaamuniversity
100654	Alabama A & M University	alabamaamuniversityal
100654	Alabama A & M University	alabamaamuniversitynormal
100654	Alabama A & M University	alabamaamuniversitynormalal
100654	Alabama A & M University	alabamaamunivnormal
100654	Alabama A & M University	alabamaamunivnormalal

New Survey Data

Country Rank	University	TotalScore	HIndex
1	Harvard University	98.1	100
2	Stanford University	93.1	89.7
3	Johns Hopkins University	92.9	86.3
4	University of Washington, Seattle	90	83.5
5	University of California, Berkeley	88.3	84.9
6	University of Michigan, Ann Arbor	88	76.6
7	Massachusetts Institute of Technology	87.6	84.9
8	University of California, Los Angeles	86.7	78
9	University of Pennsylvania	85.4	79.4
10	Columbia University	84.9	78

New Survey Data

Ranking Data			IPEDS Data Crosswalk		
HIndex	**University**	**InstName_Adj**	**InstNameMatch**	**Institution (entity) name**	**unitid**
100	Harvard University	harvarduniversity	harvarduniversity	Harvard University	166027
89.7	Stanford University	stanforduniversity	stanforduniversity	Stanford University	243744
86.3	Johns Hopkins University	johnshopkinsuniversity	johnshopkinsuniversity	Johns Hopkins University	162928
83.5	University of Washington, Seattle	universityofwashingtonseattle	universityofwashingtonseattle	University of Washington-Seattle Campus	236948
84.9	University of California, Berkeley	universityofcaliforniaberkeley	universityofcaliforniaberkeley	University of California-Berkeley	110635
76.6	University of Michigan, Ann Arbor	universityofmichiganannarbor	universityofmichiganannarbor	University of Michigan-Ann Arbor	170976
84.9	Massachusetts Institute of Technology	massachusettsinstituteoftechnology	massachusettsinstituteoftechnology	Massachusetts Institute of Technology	166683
78	University of California, Los Angeles	universityofcalifornialosangeles	universityofcalifornialosangeles	University of California-Los Angeles	110662
79.4	University of Pennsylvania	universityofpennsylvania	universityofpennsylvania	University of Pennsylvania	215062
78	Columbia University	columbiauniversity			

Fuzzy matching

```
gedscore=compged(instname_Adj,InstNameMatch)
```

instname_Adj	InstNameMatch	gedscore
columbiauniversity	columbiauniversityinthecityofnewyork	180
columbiauniversity	colemanuniversity	400

Output Code

```
ods rtf body=%outpath(_&sysdate..rtf) style=oir;
%ucformal(UCs Ranked on H-Index);
proc print data=InstNameStandard noobs label;
where f1sysnam="University of California";
var f1sysnam instnm  hindex  ;
label
 f1sysnam='System'
 instnm='IPEDS Name'
 university='Survey Name'
 hindex='H-Index'
;
run;
ods _all_ close;
```

Ready to use report

UCIrvine
Office of Institutional Research
Planning and Budget

UCs Ranked on H-Index

Page 1
11/13/16
12:12:04

System	IPEDS Name	H-Index
University of California	University of California-Berkeley	84.9
University of California	University of California-Los Angeles	78.0
University of California	University of California-San Francisco	82.8
University of California	University of California-San Diego	75.9
University of California	University of California-Davis	69.1
University of California	University of California-Irvine	62.2
University of California	University of California-Santa Barbara	69.1
University of California	University of California-Santa Cruz	64.3
University of California	University of California-Riverside	58.1

Why SAS?

- Versatile
- Accessible
- Powerful

State & Federal Legislative Maps

Employee and student data by State & Federal legislative districts.

Street Address to Longitude and Latitude

PROC GEOCODE

PROC GEOCODE

- Takes an address and matches it with their lookup data
- Provides a longitude and latitude location.

SAS Lookup Files

- Download the SAS street lookup data, found here: http://support.sas.com/rnd/datavisualization/mapsonline/html/geocode.html

  - **SAS 9.4 or Later**

    Prebuilt U.S. street lookup data for specific TIGER release (created with Ver. 12 of TIGER2Geocode):

    StreetLookupData (9.4)-2015.zip
    StreetLookupData (9.4)-2014.zip
    StreetLookupData (9.4)-2013.zip
    StreetLookupData (9.4)-2012.zip
    StreetLookupData (9.4)-2011.zip
    StreetLookupData (9.4)-2010.zip
    StreetLookupData (9.4)-2009.zip

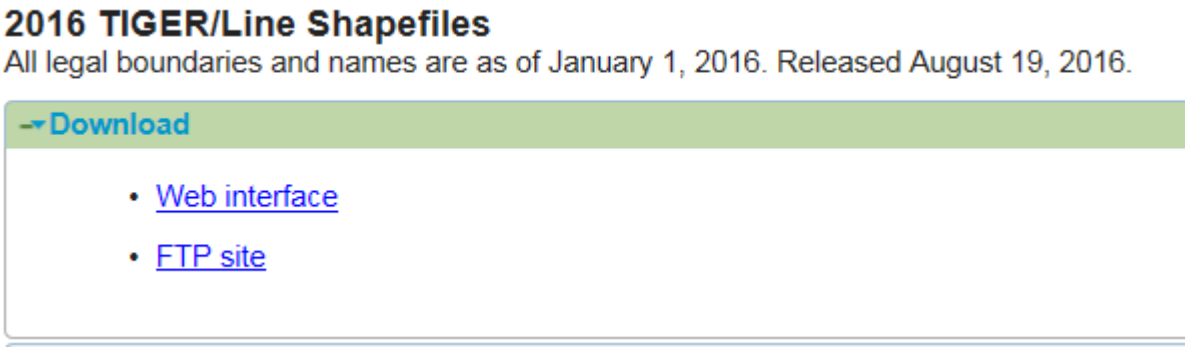
SAS Code

```
proc geocode
    method=street
    data=calif_uci_sal
    out=uci_sal_geocoded
    lookupstreet=streetlu.usm

run;
```

Shapefiles

- Download the State and Federal Legislative map shapefiles located here: http://www.census.gov/geo/maps-data/data/tiger-line.html



PROC GINSIDE

- Compares data set of coordinates to the shapefiles
- Determines whether the X and Y coordinates for each point fall inside or outside of the map shape

```
proc ginside map=ushouse data=ushouse_empl out=byushouse INCLUDEBORDER ;
   id uscongress;
run;
```

Final Report

UCIrvine
Office of Institutional Research
Planning and Budget

UC Irvine Employees
Fall 2014 Headcount
by California US Congressional Districts

Page 1
06/06/16
13:47:35

California US Congressional District	Oct 2014 Headcount
01	8
02	9
03	22
04	18
05	18
06	33
07	50
08	74
09	28
10	27

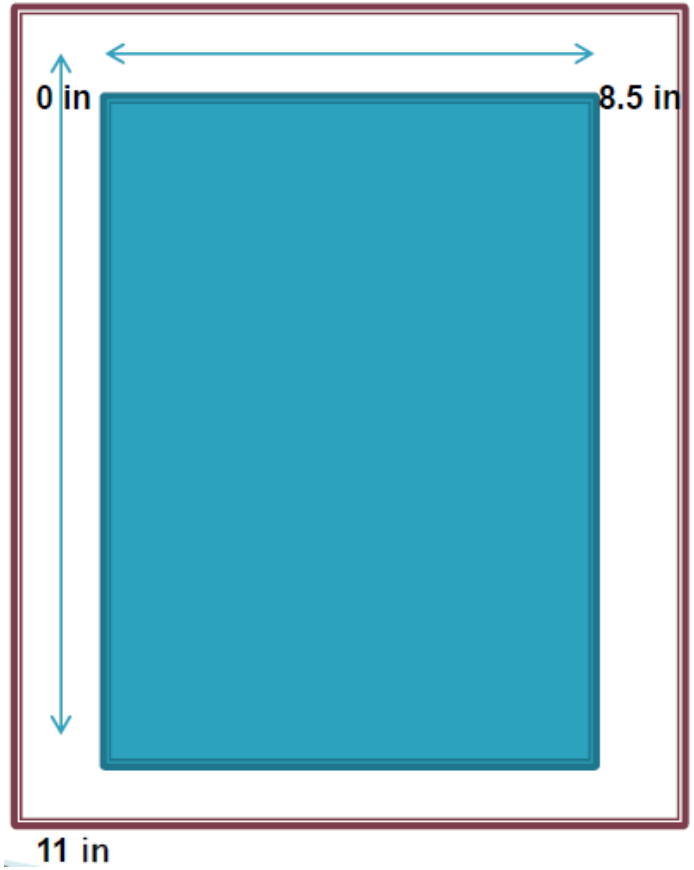
Student Highlights by County

SAS Output Delivery System (ODS)

ODS LAYOUT

```
options orientation=portrait
  papersize=letter
  nodate nonumber
  topmargin=0.0in
  bottommargin=0.0in
  leftmargin=0.0in
  rightmargin=0.0in;


  ods layout absolute
  width=8.0in height=11in
```



LAYOUT Design

```
ods region x=2.6in y=4.45in;
options nocenter;
ods graphics / height=3.75in width=5in border=off outputfmt=svg;
title1 "Enrollment by School" height=3.5pt;
proc sgplot data=Enr_College dattrmap=attrmap;
 hbar CollegeForReporting / name='bar'
  response=schoolcount  stat=sum group=StudentLevelUCIRollup2 attrid=barid
  groupdisplay=stack grouporder=descending;
 keylegend 'bar' / POSITION=bottom VALUEATTRS=(size=9pt) ACROSS=2 NOBORDER;
 yaxis fitpolicy=thin display=(nolabel noticks) valueattrs=(size=9pt) discreteorder=data;
 xaxis grid display=(noticks nolabel) valueattrs=(size=8pt);
run;
```

Output

University of California, Irvine

www.uci.edu

Fall 2015 Highlights for Students From

Orange County

Student Characteristics

Full-Time	7,861
Part-Time	457
Freshman	711
Sophomore	880
Junior	1,874
Senior/Limited	2,590
Total Undergraduates	6,055
Credential/Masters	941
Doctoral	1,322
Total Graduates	2,263

Total Students: 8,318

Student Demographics

Female	4,181
Male	4,137
First Generation	2,873
American Indian/Alaskan Native	57
Asian/Pacific Islander	3,349
Black Non-Hispanic	152
Hispanic	1,217
White Non-Hispanic	2,033
Unknown/Declined to State	522
International Student	988

New Freshman Admission Data

Entering Students	826	Mean SAT Verbal Score	591
Mean High School GPA	4.01	Mean SAT Math Score	631
Mean Total SAT Score	1816	Mean SAT Writing Score	593

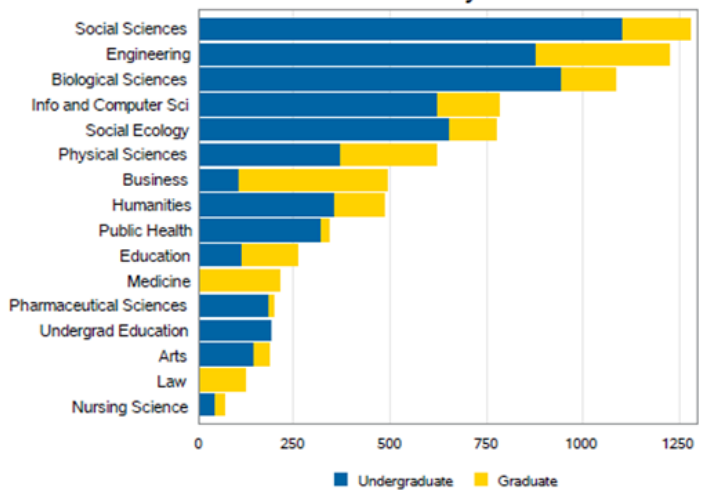
Top Freshman Feeder Schools

La Quinta High School
Westminster High School
Fountain Valley High School
Bolsa Grande High School
Katella High School

Top Transfer Feeder Schools

Irvine Valley College
Orange Coast College
Saddleback College
Santa Ana College
Golden West College

Enrollment by School



Interactive Website Map

SAS ODS (html)

ODS HTML Option

```
ODS HTML path=odsout body="Calif_Cascade.html"
(title="California County Profile reports" no_bottom_matter no_top_matter)
   style=pearl gpath="&path\images"(URL="/images/");
goptions device=png gunit=pct htitle=6 htext=4 noborder transparency
vsize=4.69in hsize=6.25in;
```

Map Design

```
proc gmap data=CAdata map=CALIFREGIONS all;
id COUNTYGR;
choro StuCnt / statistic=sum percent nolegend
      coutline=black levels=8 coutline=darkorange
      html=url
      name='ca-map'
      description='Student profiles by region';
run;
```

ODS Output

- You can find this on our website here: http://www.oir.uci.edu/county-reports.html

Useful SAS Resources

SAS provides a multitude of useful resources that one can access to learn new and useful ways of working with their products.

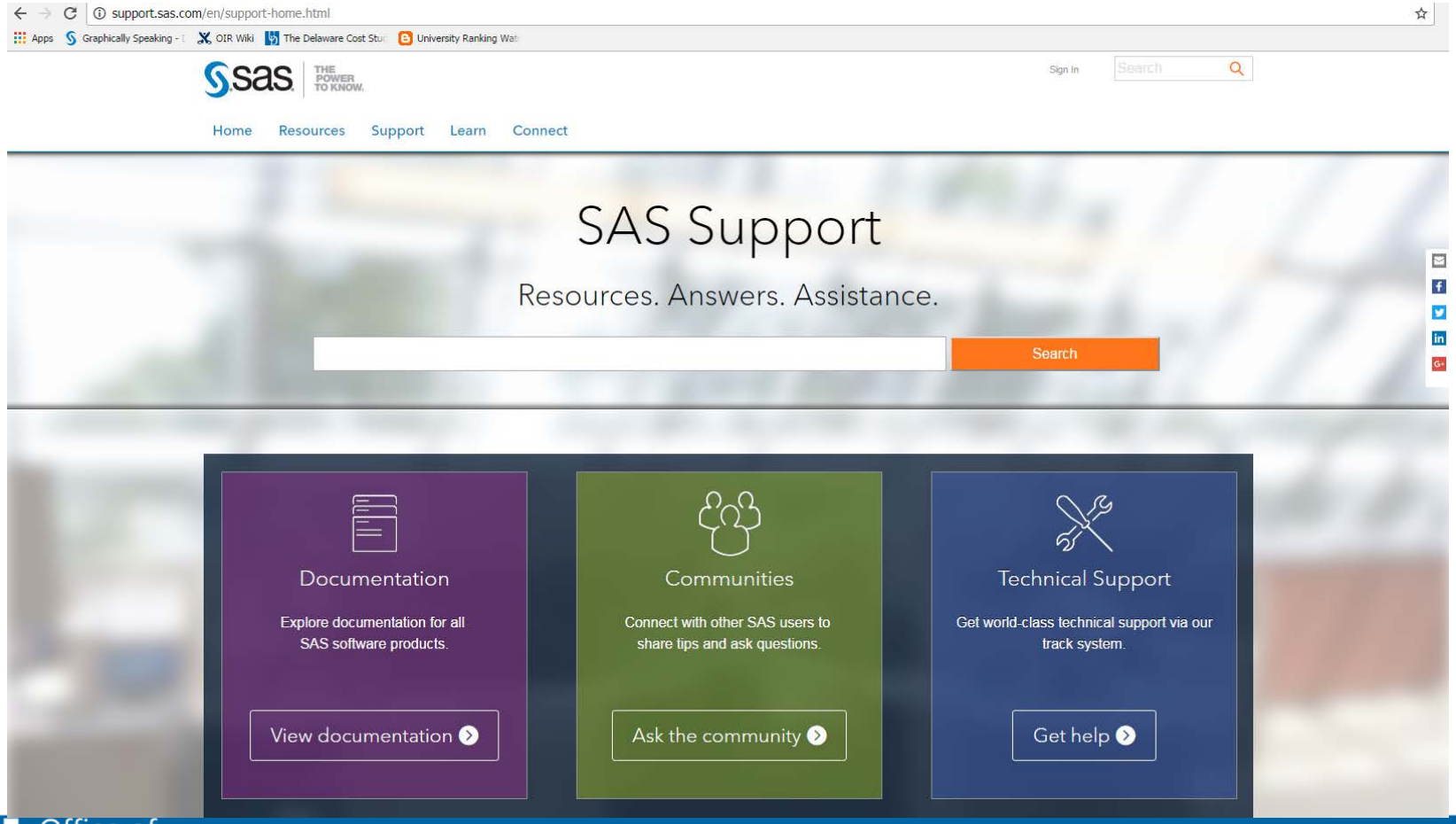
Useful SAS Resources

- SAS Support website
- Focused Areas
- Technical Papers
- Presentations and papers from the Global Forum
- Special Interest Groups – One for IR! SUGIR
- Links to Regional User groups
  - Western Users of SAS Software
- Knowledge Base Search
- Blogs
  - Graphically Speaking
  - Robert Allison's blog posts
    - and website
- Built in Help of SAS

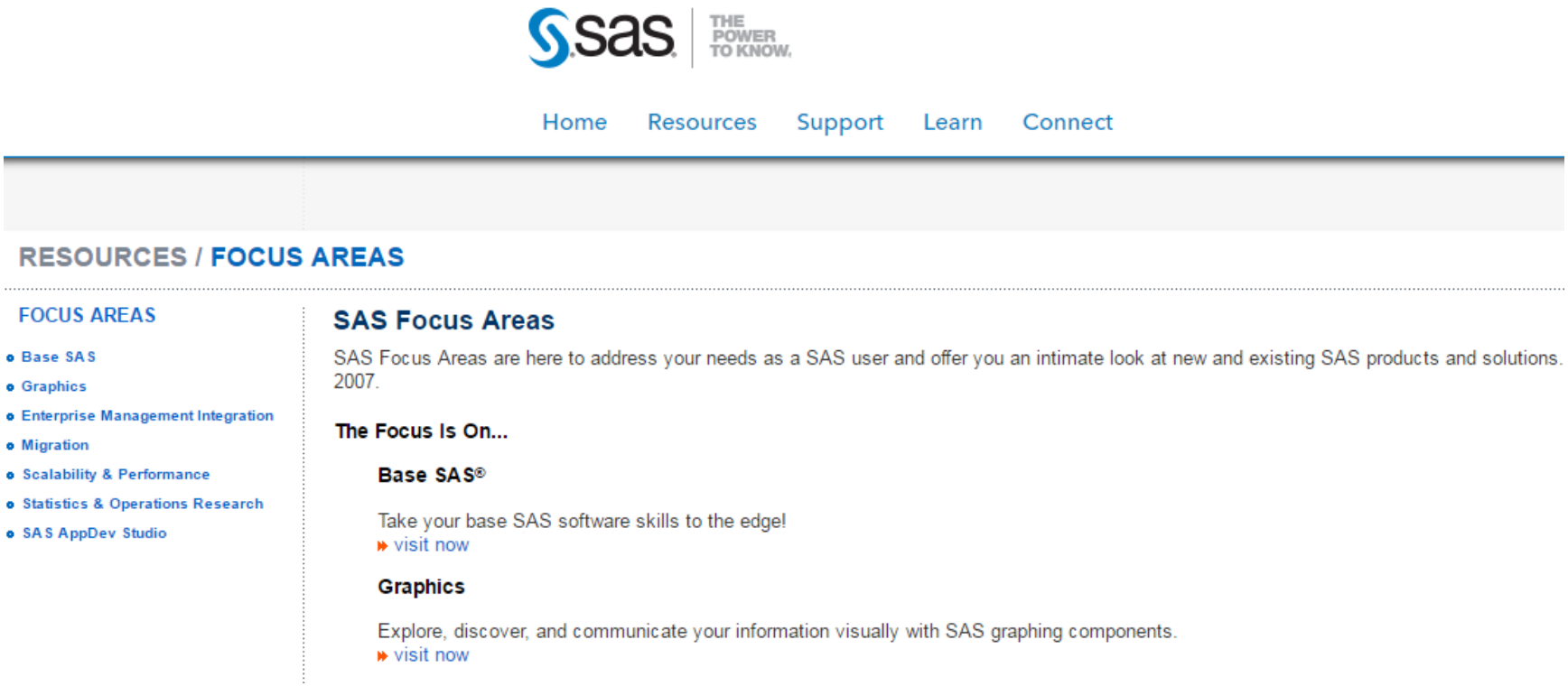
$$

- Training (50% off for those at Academic institutions)
- Books

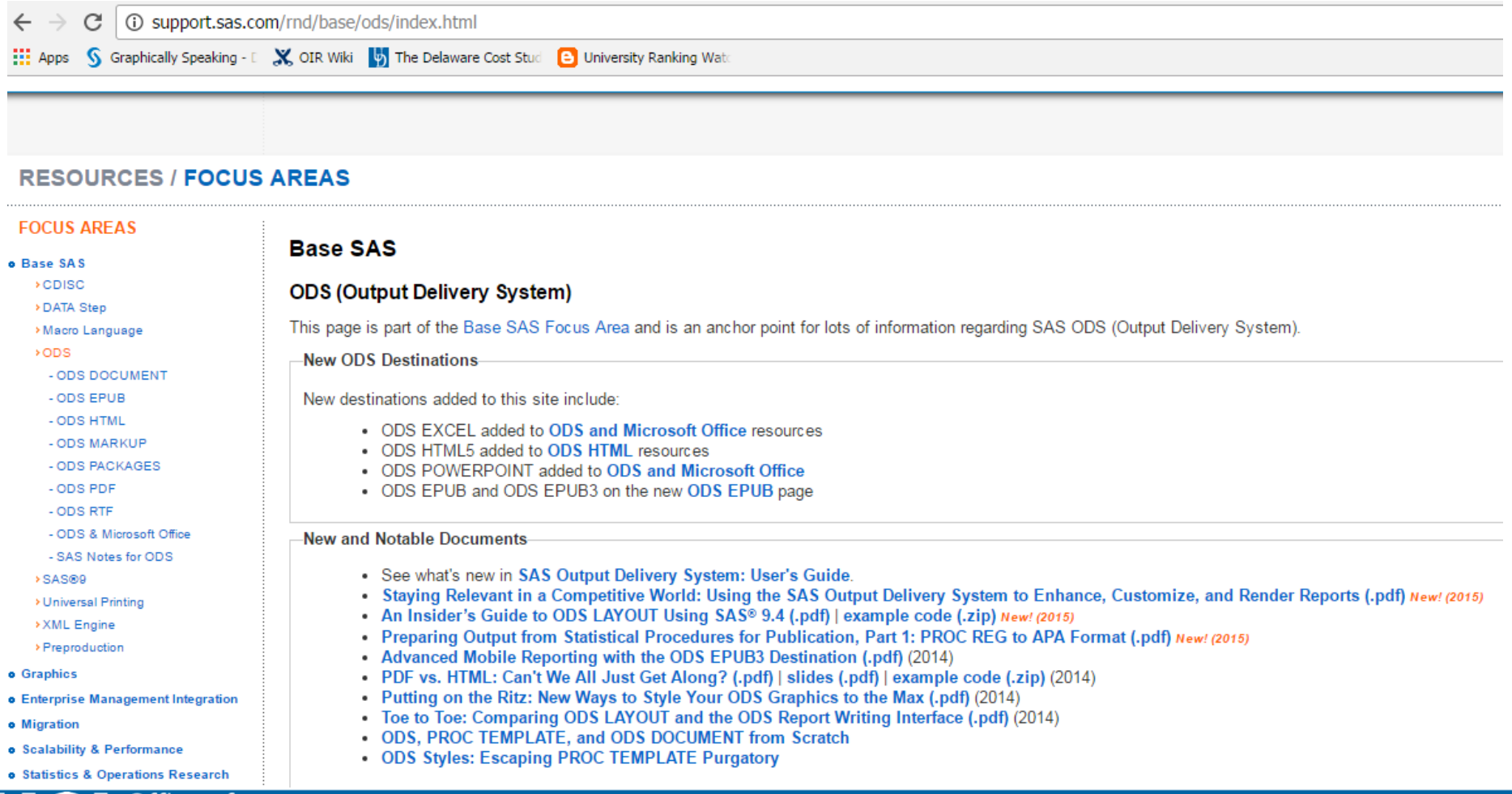
SAS Support Website (http://support.sas.com)



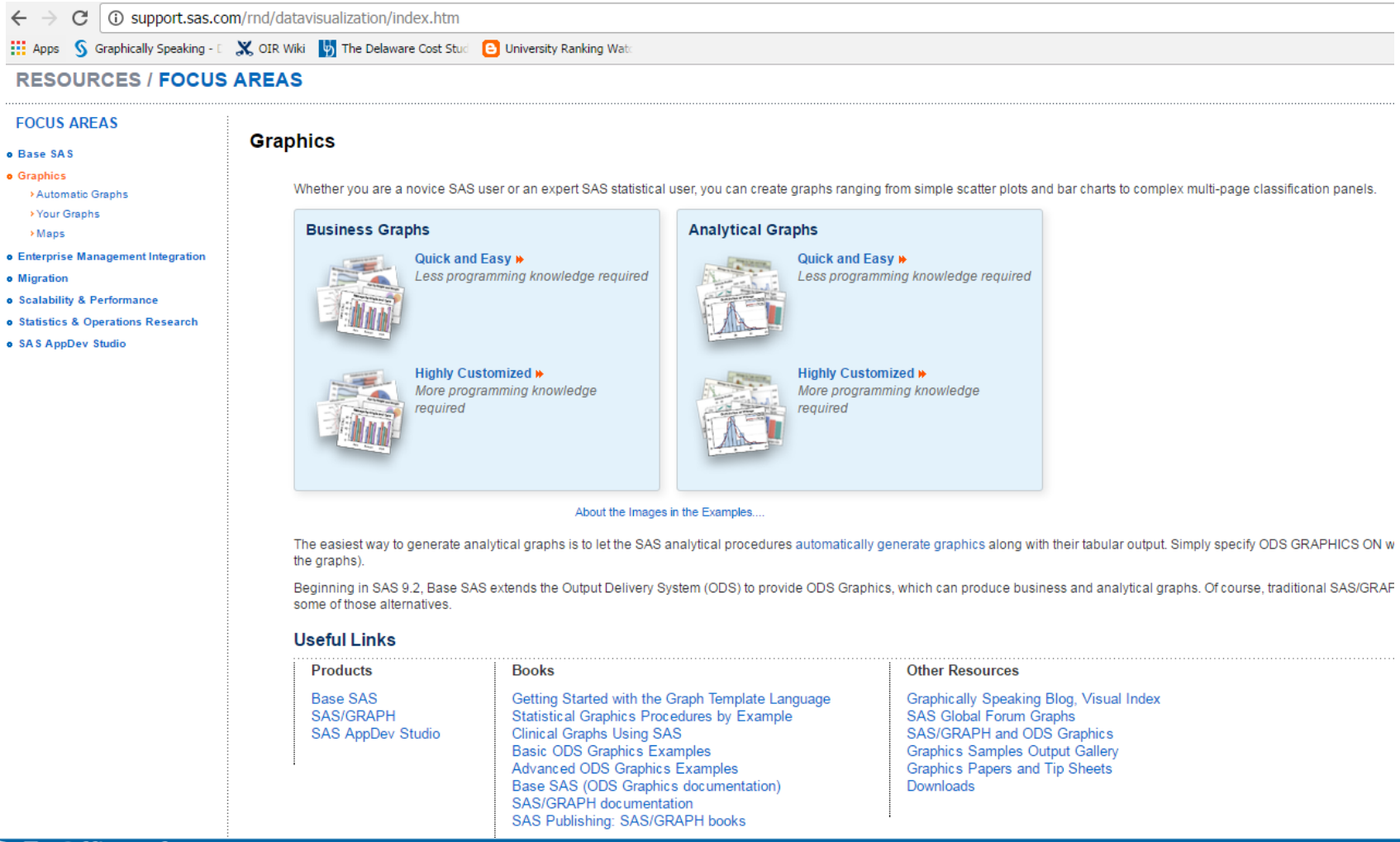
SAS provides useful information on Focused Areas (http://support.sas.com/rnd/index.html)



I particularly like the ODS Area in Base SAS (support.sas.com/rnd/base/ods)



And the Graphics Area…
(support.sas.com/rnd/datavisualization)



SAS provides Technical Reports that can give you new ideas

(http://support.sas.com/resources/papers/index.html)

RESOURCES / PAPERS

RESOURCES

- Products & Solutions
- System Requirements
- Samples
- Install Center
- Third-Party Software Reference
- Documentation
- Papers
- Focus Areas

SAS Technical Papers » Base SAS Language, PROCs, ODS, and Macros

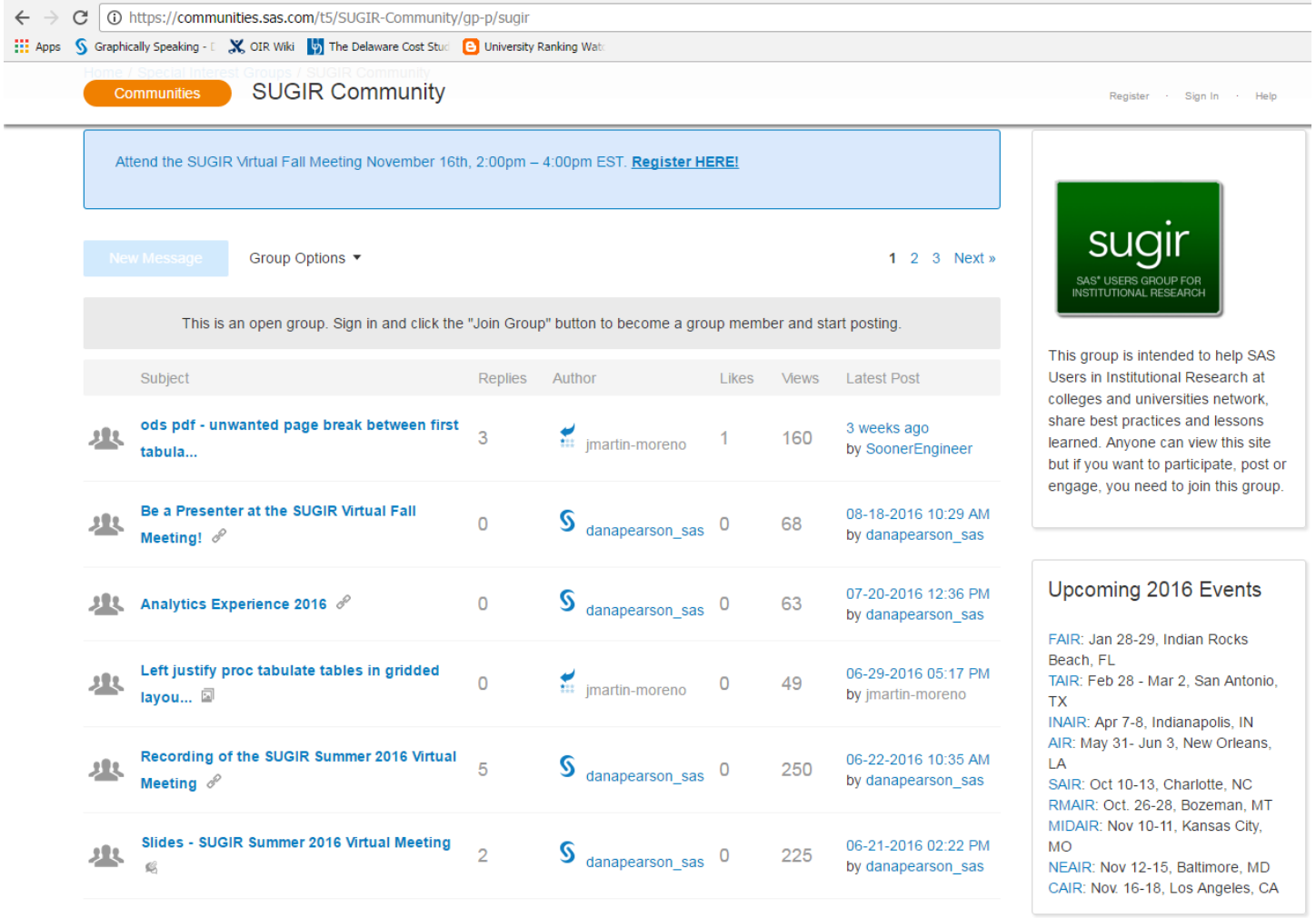
Papers Topic List

Date	Title
April 2016	Dealing with Nanoseconds in SAS® Datetime Values in Transaction Processing (PDF) This paper describes a technique for dealing with the precision problems inherent in datetime values containing nanosecond data. Floating-point values cannot store sufficient precision for this, and this limitation can be a problem for transactional data where nanoseconds are pertinent. Methods discussed include separation of variables and using the special GROUPFORMAT feature of the BY statement with MERGE in the DATA step.
April 2016	New for SAS® 9.4: A Technique for Including Text and Graphics in Your Microsoft Excel Workbooks, Part I (PDF) A new ODS destination for creating Microsoft Excel workbooks is available starting in the third maintenance release for SAS® 9.4. This destination creates native Microsoft Excel XLSX files, supports graphic images, and offers other advantages over the older ExcelXP tagset. In this presentation you learn step-by-step techniques for quickly and easily creating attractive multi-sheet Excel workbooks that contain your SAS® output. The techniques can be used regardless of the platform on which SAS software is installed. You can even use them on a mainframe! Creating and delivering your workbooks on-demand and in real time using SAS server technology is discussed. Although the title is similar to previous presentations by this author, this presentation contains new and revised material not previously presented. Using the ExcelXP tagset with earlier versions of SAS to create multi-sheet workbooks is also discussed. Read the paper (PDF) | Download the zip file (ZIP)
April 2016	A Ringside Seat: The ODS Excel Destination versus the ODS ExcelXP Tagset (PDF) The discussion covers features and benefits of the new Excel destination, differences between the Excel destination and the older ExcelXP tagset, and functionality that exists in the ExcelXP tagset that is not available in the Excel destination. These topics are all illustrated with meaningful examples. The paper also explains how you can bridge the gap that exists as a result of differences in the functionality between the destination and the tagset. In addition, the discussion outlines when it is beneficial for you to use the Excel destination versus the ExcelXP tagset, and vice versa.
April 2016	The Dynamic Duo: ODS Layout and the ODS Destination for PowerPoint (PDF) Through code examples this paper shows you how to create a custom title slide, as well as place the desired number of graphs and tables on each slide.
April 2016	A Second Look at the ODS Destination for PowerPoint (PDF) This paper demonstrates how to use the ODS destination for PowerPoint to create attractive presentations from your SAS® output.
April 2016	That's All Right: More Complex Reports (PDF) The paper presents a nuts-and-bolts look at more complex report examples gleaned from SAS® Community Forum questions and questions from students

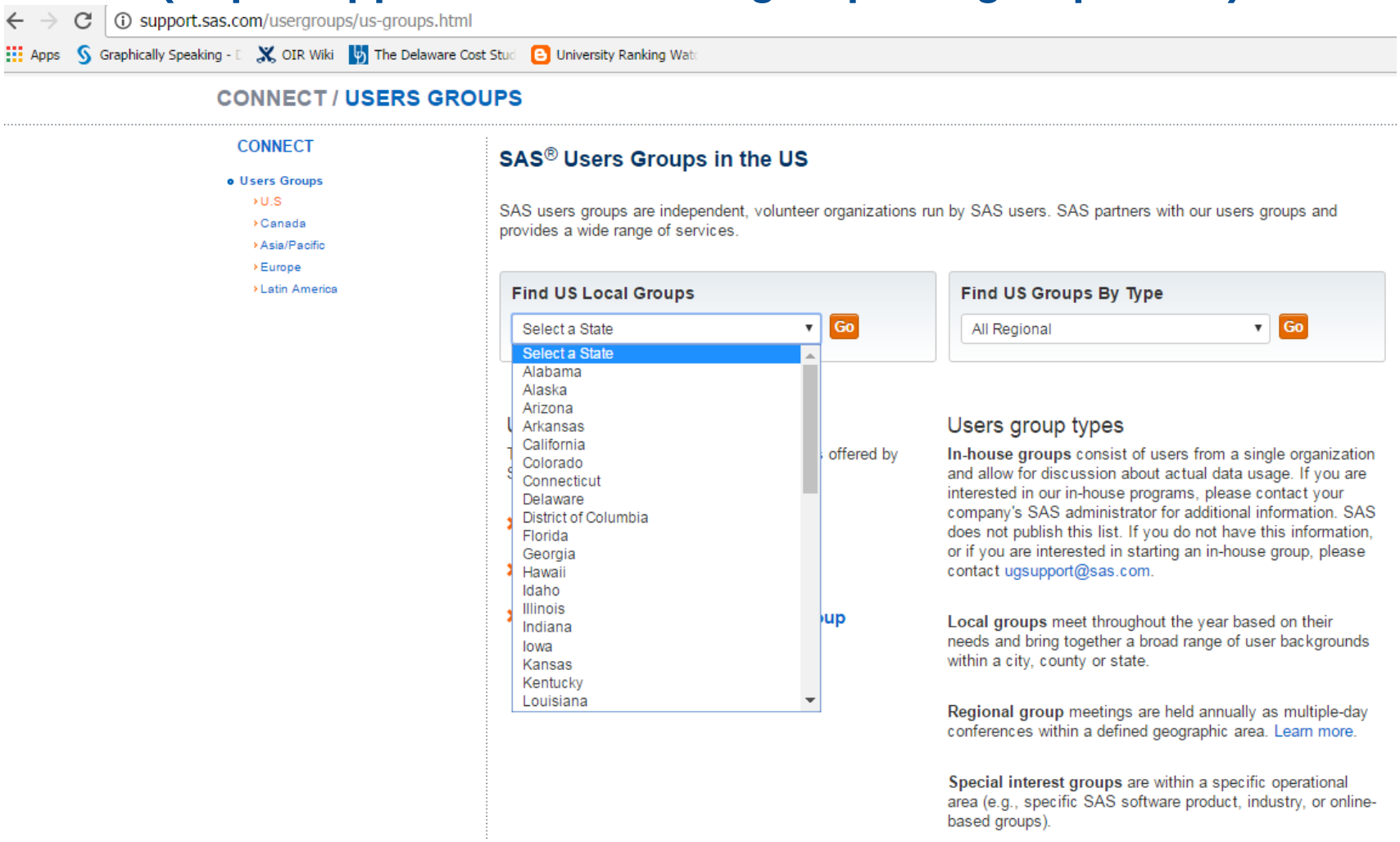
And access to past Global Forum papers…

(http://support.sas.com/events/sasglobalforum/previous/online.html)

There are User Communities as well, one for IR…
(https://communities.sas.com/t5/SUGIR-Community/gp-p/sugir)



And Regional User Groups that hold their own meetings…
(http://support.sas.com/usergroups/us-groups.html)



With these suggested for California…

CONNECT / USERS GROUPS

CONNECT

- Users Groups
  - U.S
  - Canada
  - Asia/Pacific
  - Europe
  - Latin America

SAS® Users Groups in the US

These groups are within your selected state, but they do not have an event scheduled at this time.

CALIFORNIA CENTRAL COAST SAS USERS GROUP **Contact:** Rebecca Ottesen **Phone:** 805-594-0441	**Email:** rottesen@calpoly.edu
GREATER SACRAMENTO SAS USERS GROUP **Contact:** Leonard Seitz **Phone:** 916-654-2610	**Email:** leonard.seitz@dot.ca.gov **Website:** www.sascommunity.org
LOS ANGELES BASIN SAS USERS GROUP **Contact:** Kim LeBouton **Phone:** 562-305-1131	**Email:** labsug@gmail.com **Website:** www.labsug.net
ORANGE COUNTY & INLAND EMPIRE SAS UG **Contact:** Lida Gharibvand **Phone:** 949-230-5439	**Email:** lida.gh07@gmail.com **Website:** www.sascommunity.org/wiki/Orange_County_and_Inland_Em
SAN DIEGO SAS USERS GROUP **Contact:** Wei Cheng **Phone:** 760-603-3807	**Email:** wcheng@isisph.com **Website:** www.sandsug.org
SAS USERS GROUP WESTWOOD **Contact:** Michael Johnston **Phone:** 310-280-6446	**Email:** michael.johnston.email@gmail.com **Website:** www.sascommunity.org/wiki/SAS_Users_Group_Westwood
WESTERN USERS OF SAS SOFTWARE **Contact:** SCOTT LESLIE	**Email:** PRESIDENT@WUSS.ORG **Website:** WWW.WUSS.ORG/

Searching their Knowledge base to fix errors or find out how to do something (http://support.sas.com/en/technical-support.html)

Standard Search | Advanced Search | Results Filter

inserting images into ods statements [Submit]

1 - 6 of 6 results for **inserting images into ods statements** Previous | 1 | Next

Sort by: Date | **Relevance** Hide results summaries

2012-05-22 **46552 - Embed images in a PROC REPORT table** - Sample
This sample demonstrates how to insert images as column values in PROC REPORT output.
http://support.sas.com/kb/46/552.html, 23KB

2012-05-22 **46552 - Embed images in a PROC REPORT table**
... GRAPH® GPLOT procedure to create images to be inserted into the REPORT procedure output. You ... ods listing close; ods rtf file='sample.rtf'; ods pdf file='sample.pdf' notoc ... year 1986; column year sales image; define year / group; define image / 'Sales trend for year' computed ...
http://support.sas.com/kb/46/552.html, 30KB

2016-08-11 **58682 - The PREIMAGE attribute is ignored in ODS RTF output when you use the new inline formatting syntax** - Problem Note
Attempting to insert a logo or image in the ODS RTF destination using PREIMAGE in a TITLE or TEXT= statement using the new SAS® 9.2 inline formatting style syntax fails to place the image in the document. Use ...
http://support.sas.com/kb/58/682.html, 22KB

2015-05-18 **55808 - ODS LAYOUT: Placing text, graphs, and images on the same PDF page** - Sample
ODS LAYOUT ABSOLUTE is new syntax for SAS® 9.4 (TS1M0). ODS LAYOUT enables the precise placement of text, tables, and images on a PDF page using ODS REGION statements. This sample shows the use of ODS LAYOUT ...
http://support.sas.com/kb/55/808.html, 26KB

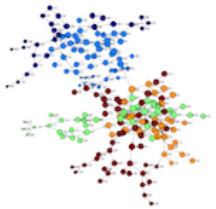
Reading the Blogs of SAS authors
(http://blogs.sas.com/content/)

SAS BLOGS HOME

search blogs.sas.com SEARCH

Featured Post

SAS VOICES
FALKO SCHULZ
OCT 20, 2016 AT 11:32 AM ET



Analyzing social networks using Python and SAS Viya

6465 0

The study of social networks has gained importance over the years within social and behavioral research on HIV and AIDS. Social network research can show routes of potential viral transfer, and be used to understand the influence of peer norms and practices on the risk behaviors of ... Read More

RECENT POSTS

STATE AND LOCAL CONNECTION

3 reasons why International Fraud Awareness Week matters to government

SHAUN BARRY | NOV 14, 2016

International Fraud Awareness Week is here! I know, I know… Fraud Week is not quite as exciting as Shark Week. It doesn't appeal to your taste buds l... Read More

JMP BLOG

4 ways to use fixed/baseline (historical) control limits in Control Chart Builder

TONYA MAULDIN | NOV 14, 2016

Customers often ask me how to use fixed/baseline control limits. This type of limit is sometimes referred to as historical control limit. Instead of a... Read More

STATE AND LOCAL CONNECTION

Featured Bloggers

ADELE SWEETWOOD
CUSTOMER INTELLIGENCE
SENIOR VICE PRESIDENT OF GLOBAL MARKETING & SHARED SERVICES

ANJELICA CUMMINGS
SAS VOICES
SR ASSOCIATE COMMUNICATIONS SPECIALIST

CAROLINE HERMON
SAS USERS
SR ACCOUNT EXECUTIVE

PRASHANT HEBBBAR
GRAPHICALLY SPEAKING
PRINCIPAL SOFTWARE DEVELOPER

Subscribe to this blog

Enter your email address:

One of my favorites is Graphically Speaking…

(http://blogs.sas.com/content/graphicallyspeaking/)

Graphically Speaking
Data Visualization with a focus on SAS ODS Graphics

SAS THE POWER TO KNOW.

SAS BLOGS HOME > GRAPHICALLY SPEAKING

Layers vs annotation

Sanjay Matange | NOVEMBER 7, 2016

1112 0 Tweet G+1 0 Like 0 Share

Last week a user asked about BY variable group processing for SGAnnotate with SGPLOT procedure. The user provided a simple use case for the question (always a good idea) using the sashelp.class data set. The graph included a display of reference lines for the mean value of height using annotation. The problem was that all the lines defined were being rendered in each graph and were not getting filtered with the BY group as SGAnnotation does not support BY variable processing. See the graph in the linked question above.

This is a good example of a user who is familiar with SAS/GRAPH programming using SGPLOT. When you do that, it is useful to remember that SGPLOT supports many plot statements that can be "Layered" together to create a graph. With SGPLOT, graphs should preferably be built by adding plot layers as far as possible. This will work for a large number of graphs and annotation may be needed only for a few cases.

This use case is actually better handled in SGPLOT by using plot layers. Instead of building a separate data set of the mean values by sex for the annotated reference lines, we can merge that data into the single data set. We compute the mean values by sex using the MEANS procedure and then we can merge the computed data into the original data set (by Sex). The last few rows of the final data set are shown on the right. The data set is a merge of the relevant columns of sashelp.class and the computed mean values by sex. I have also added a column called LBL for the label that I want to display on the mean reference line at x=zero.

Obs	meanHeight	Sex	Height	Weight	Lbl	Zero
14	.	F	66.5	112		.
15	.	M	72.0	150		.
16	.	M	64.8	128		.
17	.	M	67.0	133		.
18	.	M	57.5	85		.
19	.	M	66.5	112		.
20	60.6	F	.	.	Mean=60.6	0
21	63.9	M	.	.	Mean=63.9	0

search this blog SEARCH

About this blog

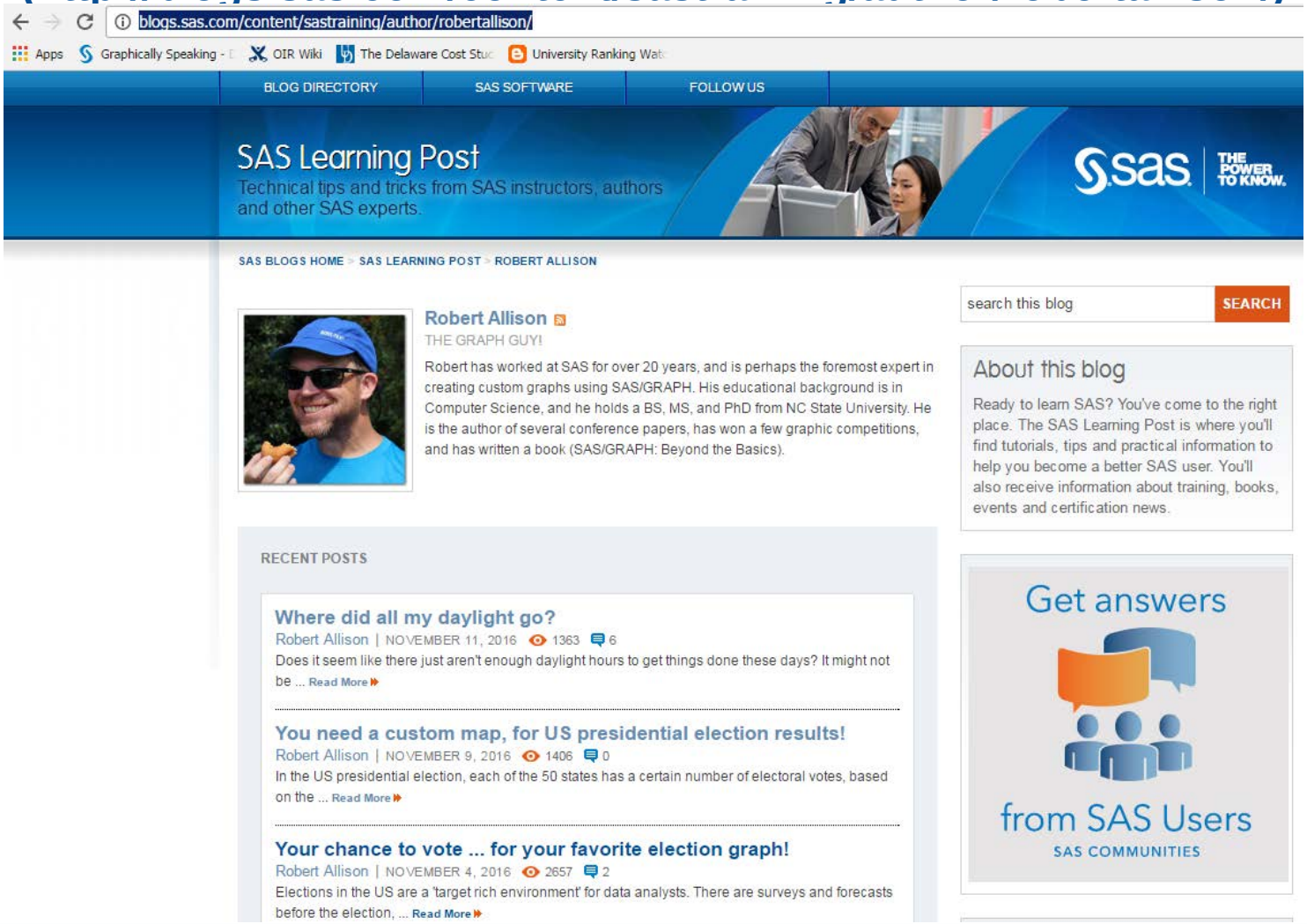
Welcome to Graphically Speaking, a blog by Sanjay Matange focused on the usage of ODS Graphics for data visualization in SAS. The blog will cover topics related to the Statistical Graphics procedures, the Graph Template Language and the ODS Graphics Designer. Sanjay is author of *Clinical Graphs Using SAS*

Getting Started with the Graph Template Language in SAS

Statistical Graphics Procedures by Example: Effective Graphs Using SAS

And I like to check out anything done by Robert Allison…

(http://blogs.sas.com/content/sastraining/author/robertallison/)



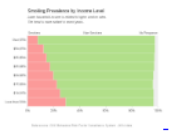
As well as Robert's website…

(http://robslink.com/SAS/Home.htm)

Robert Allison's SAS/Graph Samples #87

Click on thumbnail to see full-size chart.
Click on label to see descriptions and SAS code.

Fireworks Animation


Smoking Prevalence

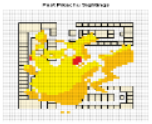
University Websites

Nintendo Stock

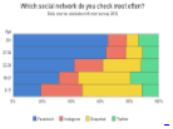
Pokémon Analysis

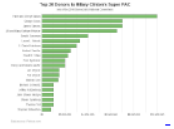
US & Europe Overlay

Pikachu Grid Graph


Pikachu Analytics

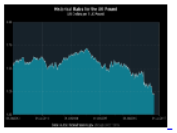
Internet Users in US

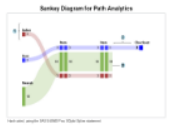

Social Network Usage

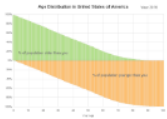

Hillary top Donors

Rare Pokémon Map

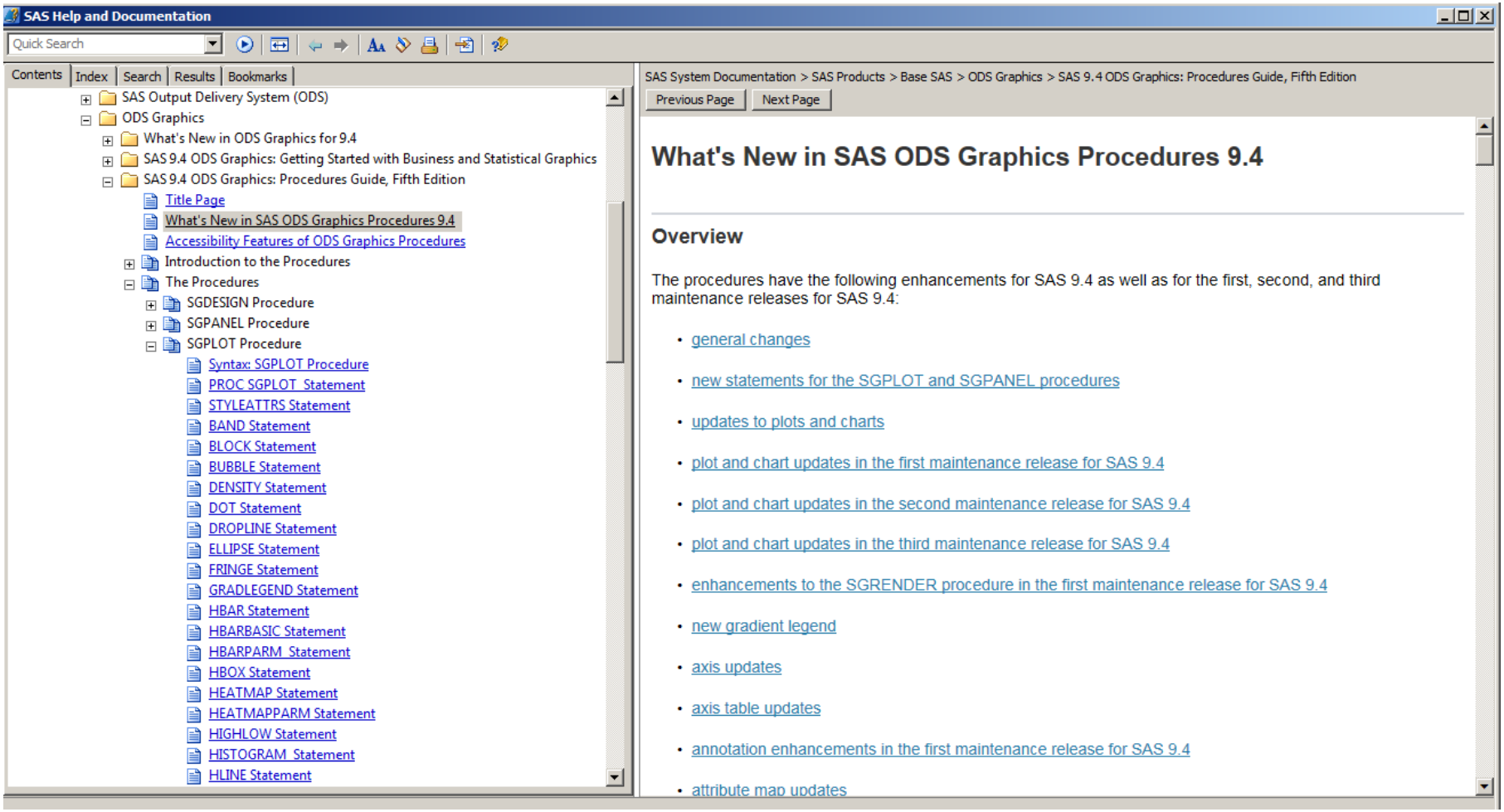
Mapping British Isles


UK Pound $ Value


Hard-Coded Sankey


US Age Distribution

And of course there is always the built in Help of SAS…



And Make Sure to Keep Having Fun with It!

How to contact us:

oir@uci.edu

Examples will be posted on our website, http://www.oir.uci.edu, by the end of November.

Look for the section heading "Professional Activities."

Questions?