

Basic Data Visualization Tips for Designing Tableau Dashboards

Prepared for
DePaul Tableau Users Group
March 12, 2014



Challenge

Synthesize your information and create **clear** graphics that provide **quicker** access to meaningful insights.





Data Visualization Resources

- Edward Tufte
 - The Visual Display of Quantitative Information. Second Edition. Graphics Press, 2001.
- Stephen Few
 - Now You See It: Simple Visualization Techniques for Quantitative Analysis. Analytics Press, 2009.
 - Information Dashboard Design. O'Reilly Media, Inc., 2006.
 - Show Me the Numbers: Designing Tables and Graphs to Enlighten. Analytics Press, 2004.
- Stephen Kosslyn
 - Graph Design for the Eye and Mind. Oxford University Press, 2006.

Tableau Design Resources

- A Guide to Creating Dashboards People Love to Use. Juice Analytics, 2010.
 - [http://www.juiceanalytics.com/wp-content/uploads/2010/11/Guide to Dashboard Design.pdf](http://www.juiceanalytics.com/wp-content/uploads/2010/11/Guide%20to%20Dashboard%20Design.pdf)
- 5 Best Practices for Creating Effective Dashboards. Tableau Software, August 2011.
 - <http://www.tableausoftware.com/learn/whitepapers/5-best-practices-for-effective-dashboards>
- Best Practice for Designing Efficient Tableau Workbooks. Alan Eldridge, Tableau Software, January 2013.
 - <http://www.tableausoftware.com/about/blog/2013/10/best-practices-designing-efficient-workbooks-25391>

Basic Tips for Designing Dashboards

1. Define the research question
2. Select the most effective chart type
3. Do the pre-work for the audience
4. Use color and font effectively
5. Organize dashboard by importance
6. Test for understanding

Basic Tips for Designing Dashboards

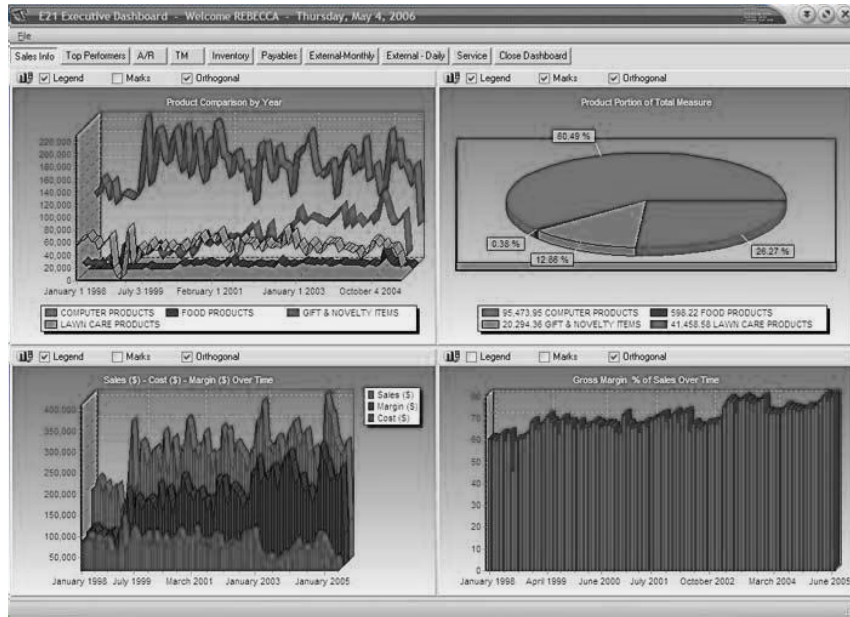
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Create an outline for your dashboard

Be specific and write it down!

Don't

Open Tableau and add ALL the data you have



Do

Answer these questions before opening Tableau Software



Who is my Audience?



What question(s) need to be answered?



What metrics would best answer the question(s)



What type of dashboard am I creating?

What type of dashboard am I creating?

Scope	<input type="checkbox"/> Broad: Displaying information about the entire organization	<input type="checkbox"/> Specific: Focusing on a specific function, process, product, etc.		
Business role	<input type="checkbox"/> Strategic: Provides a high-level, broad, and long-term view of performance	<input type="checkbox"/> Operational: Provides a focused, near-term, and tactical view of performance		
Time horizon	<input type="checkbox"/> Historical: Looking backwards to track trends	<input type="checkbox"/> Snapshot: Showing performance at a single point in time	<input type="checkbox"/> Real-time: Monitoring activity as it happens	<input type="checkbox"/> Predictive: Using past performance to predict future performance
Customization	<input type="checkbox"/> One-size-fits-all: Presented as a single view for all users	<input type="checkbox"/> Customizable: Functionality to let users create a view that reflects their needs		
Level of detail	<input type="checkbox"/> High: Presenting only the most critical top-level numbers	<input type="checkbox"/> Drill-able: Providing the ability to drill down to detailed numbers to gain more context		
Point of view	<input type="checkbox"/> Prescriptive: The dashboard explicitly tells the user what the data means and what to do about it	<input type="checkbox"/> Exploratory: User has latitude to interpret the results as they see fit		

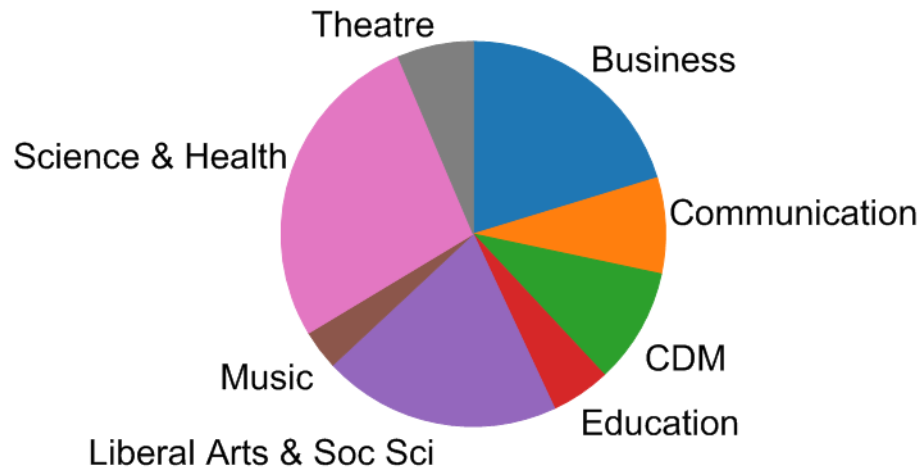
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Pie charts are rarely the best option

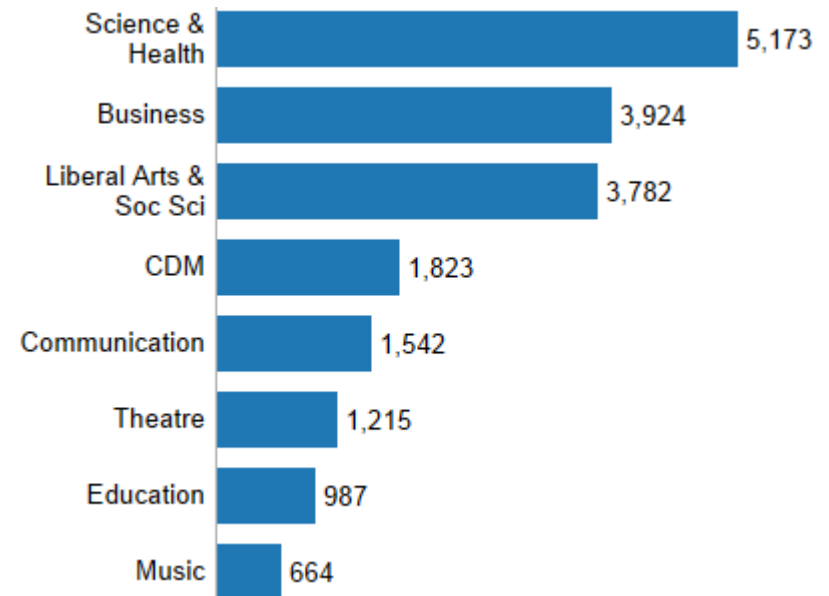
[Don't]

Fall 2014 Freshman Applications



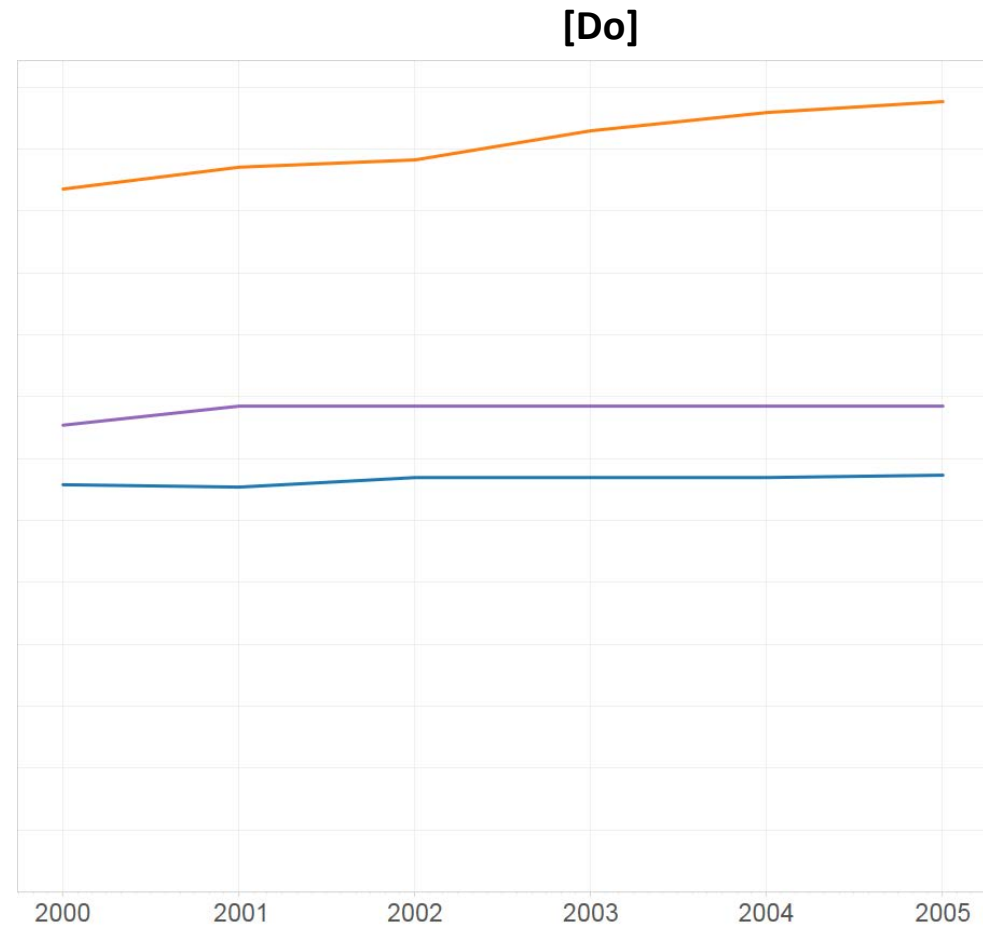
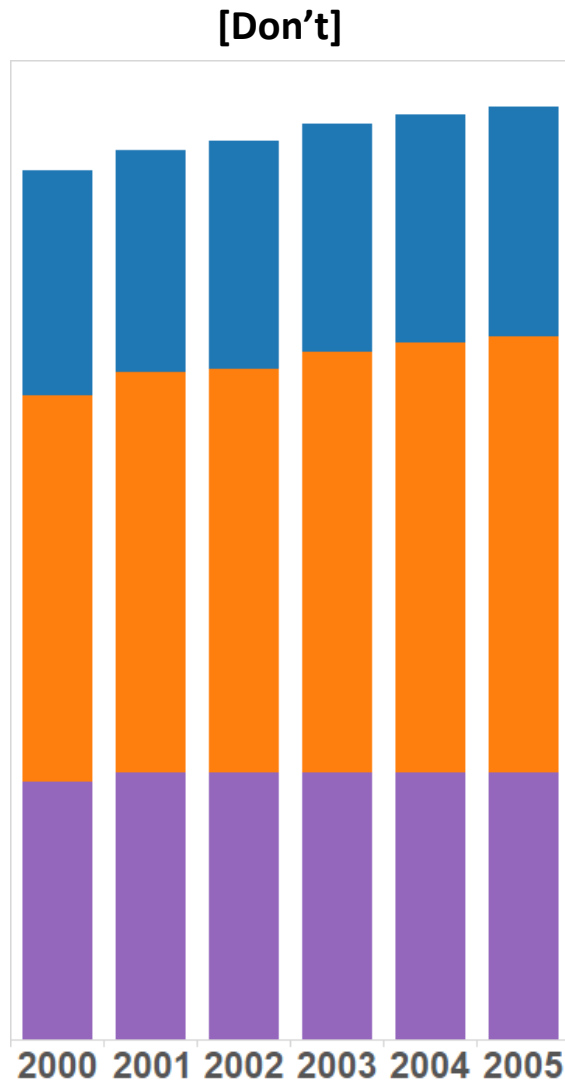
[Do]

Fall 2014 Freshman Applications
% of Total by College



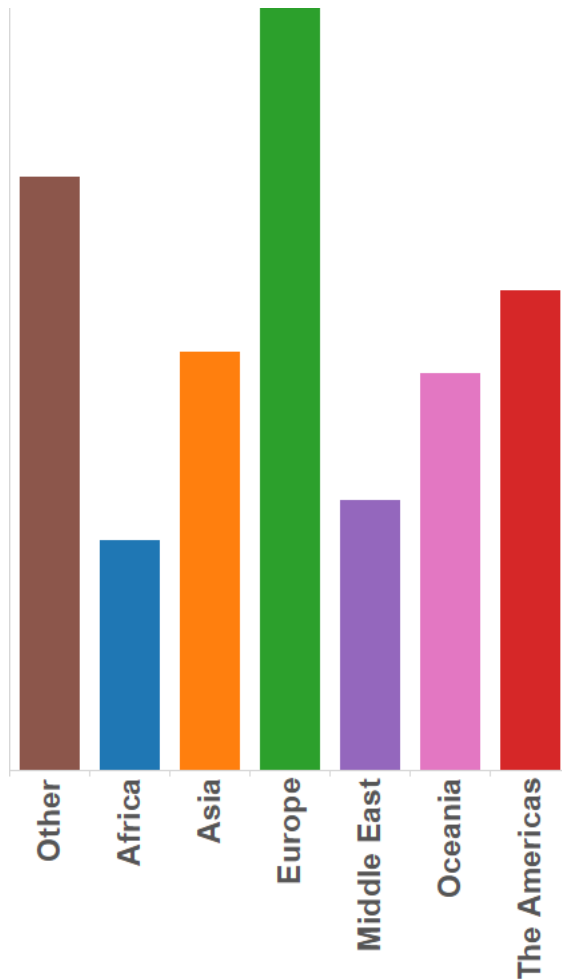
More info on pie charts: http://www.perceptualedge.com/articles/visual_business_intelligence/save_the_pies_for_dessert.pdf
Numbers used in this presentation are for illustration purposes only.

Line charts show trends and interactions

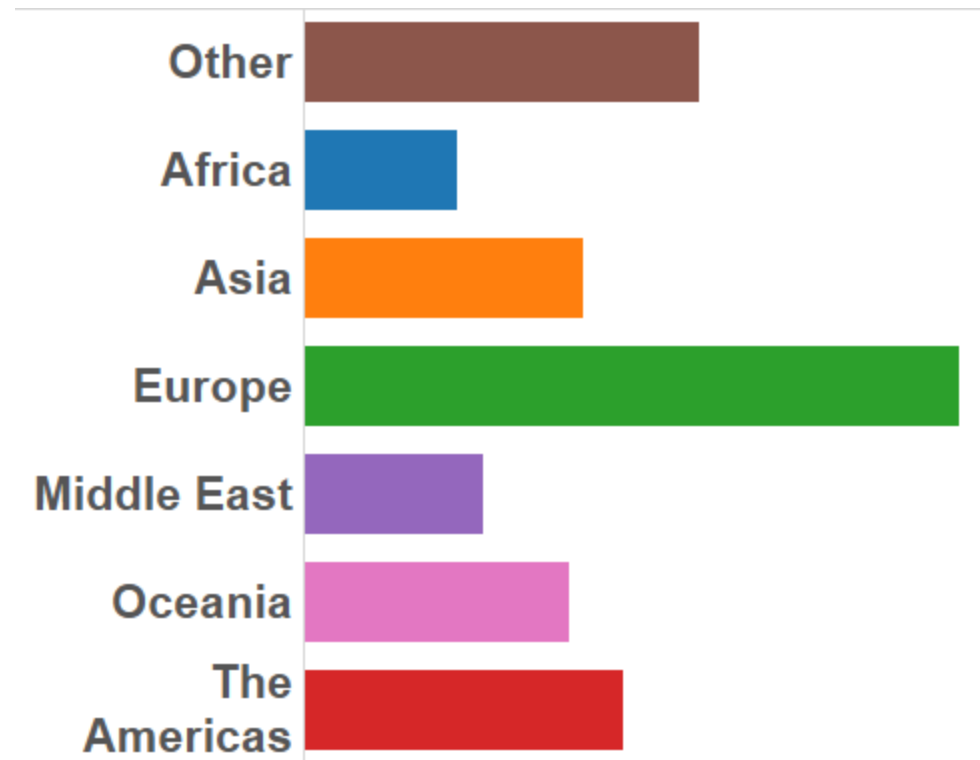


Horizontal bar charts work best for long labels

[Don't]



[Do]



Tables are good for showing specific values

	App Final	App YTD	App Cur	App % Chg	Admit Final	Admit YTD	Admit Cur	Admit % Chg	Dep Final	Dep YTD	Dep Cur	Dep % Chg	Enroll Final	Enroll YTD	Enroll Cur	Enroll % Chg
Business	4,215	4,155	3,924	-6%	2,838	2,540	2,675	5%	758	175	210	20%	645	0	0	
Communication	1,731	1,724	1,542	-11%	1,145	1,019	1,093	7%	277	72	87	21%	234	0	0	
CDM	1,695	1,657	1,823	10%	992	870	1,163	34%	312	100	114	14%	285	0	0	
Education	1,097	1,098	987	-10%	571	525	596	14%	131	40	34	-15%	122	0	0	
Liberal Arts & Soc Sci	3,798	3,777	3,782	0%	2,542	2,281	2,632	15%	589	146	147	1%	513	0	0	
Music	659	683	664	-3%	162	0	4		61	0	1		61	0	0	
Science & Health	5,680	5,694	5,172	-9%	3,534	3,237	3,413	5%	593	141	139	-1%	482	0	0	
Theatre	1,080	1,112	1,215	9%	163	0	0		90	0	0		83	0	0	

Adding additional columns to tables in Tableau:

<http://kb.tableausoftware.com/articles/knowledgebase/avoiding-row-and-column-concatenation>

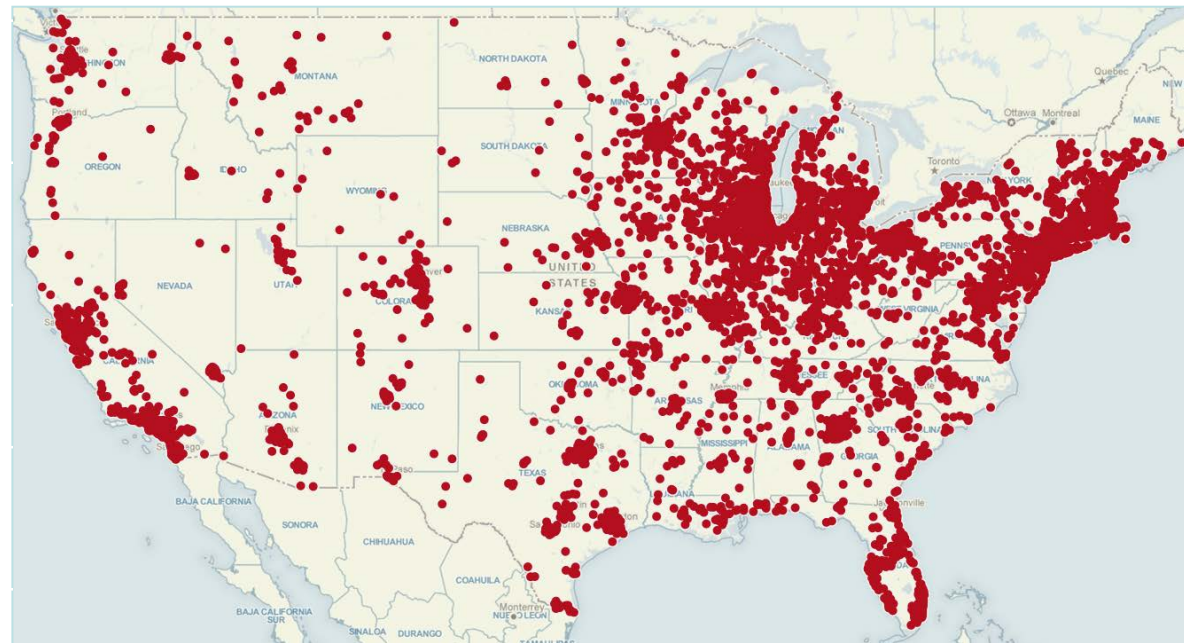
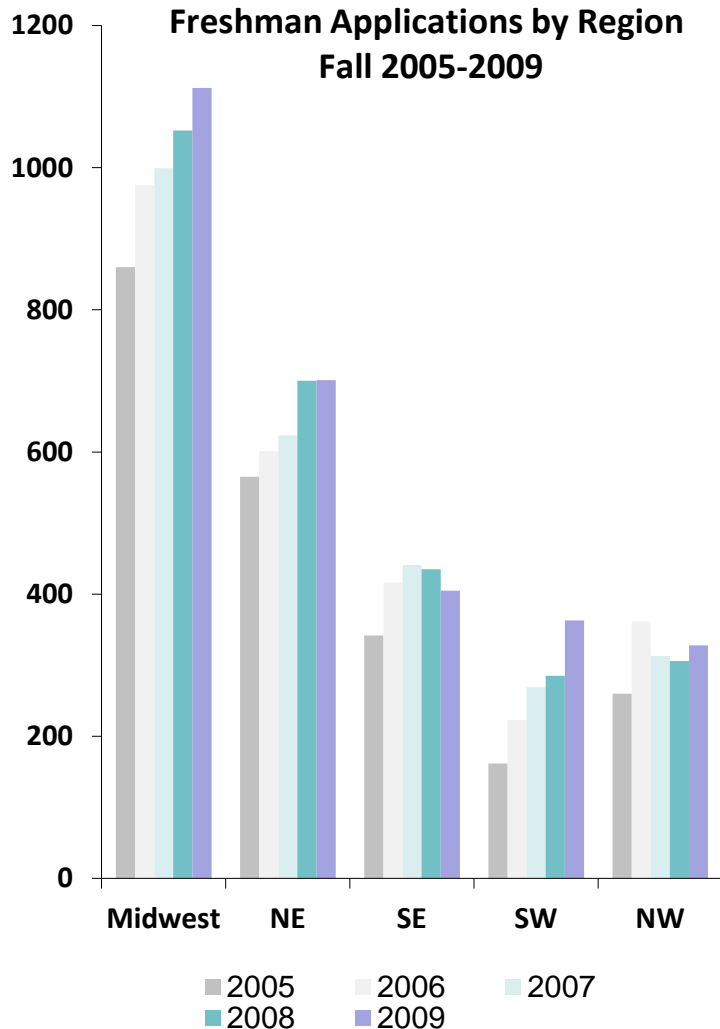
Maps clearly visualize regions or territories

[Don't]

[Do]

Freshman Applications by Region
Fall 2005-2009

Freshman Applications by Zip Code
Fall 2005-2009



Heat maps help the user quickly identify hot spots in large data sets



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Remove irrelevant information

Which college has the highest proportion of women?

[Don't]

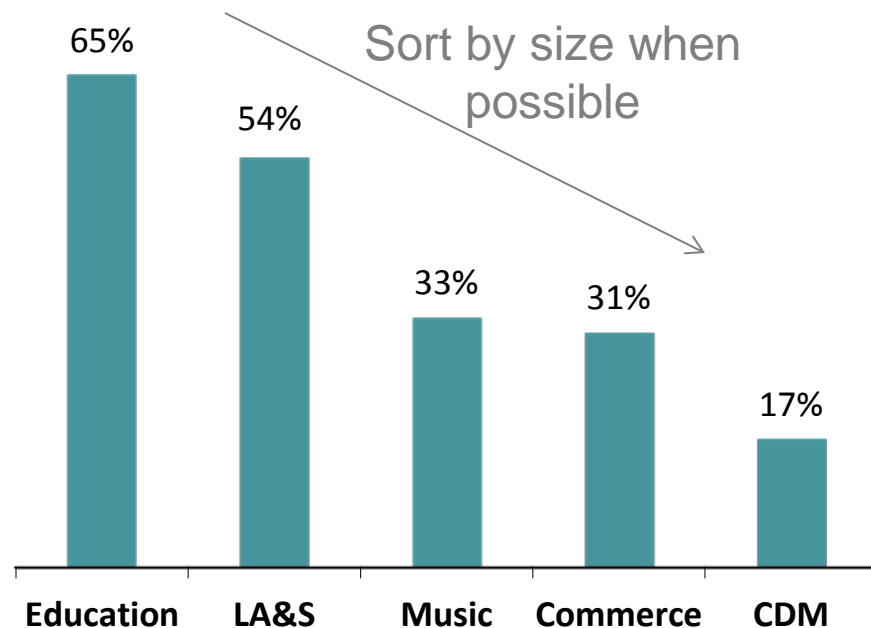
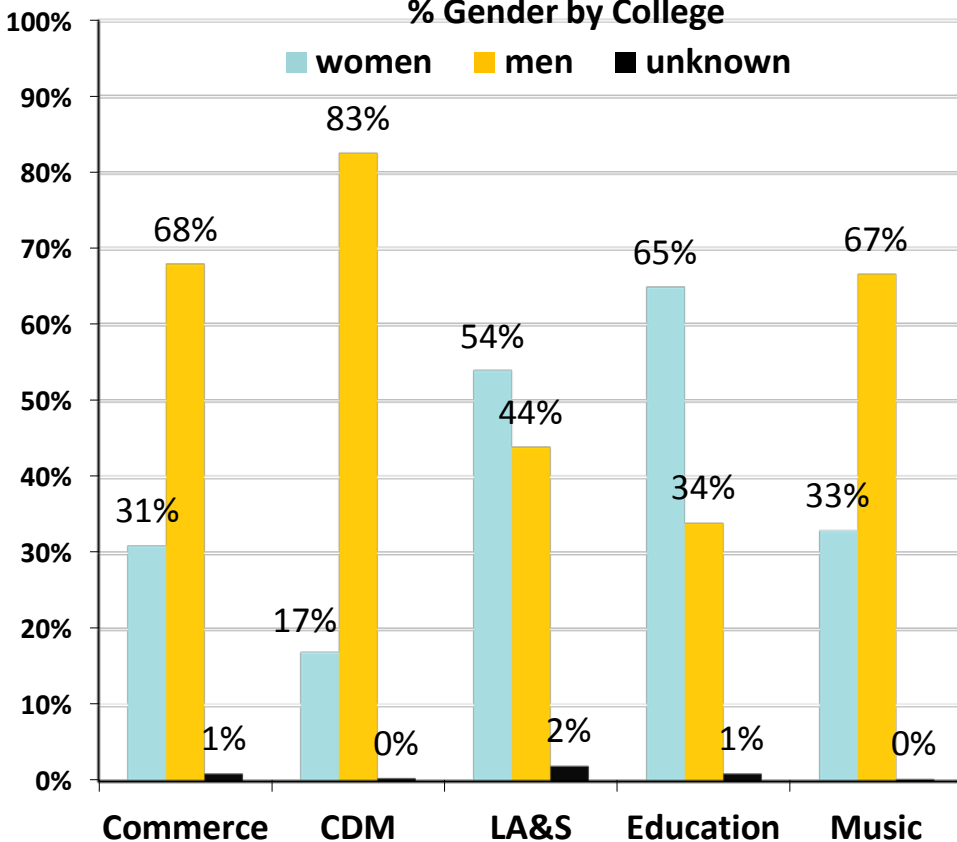
[Do]

% Gender by College

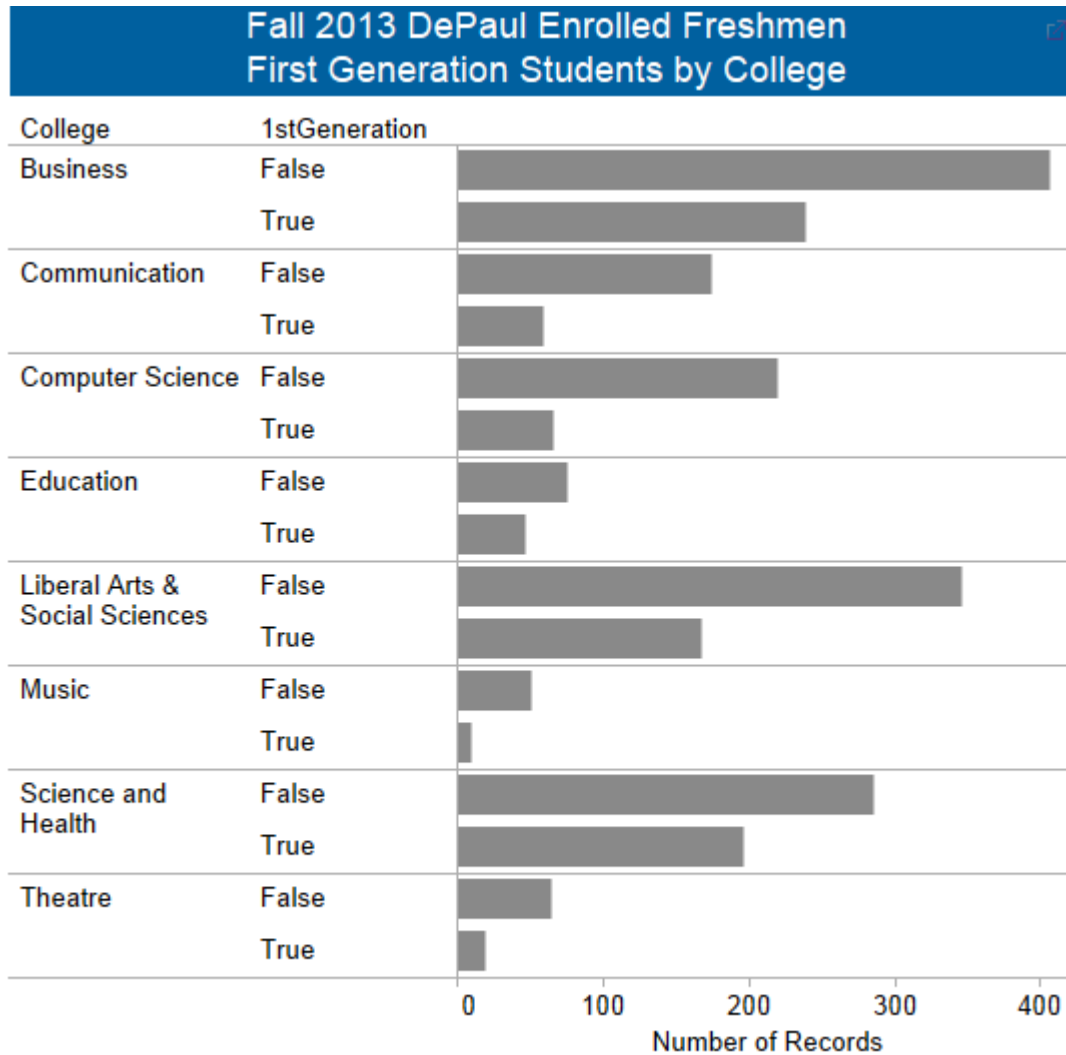
% Women by College

women men unknown

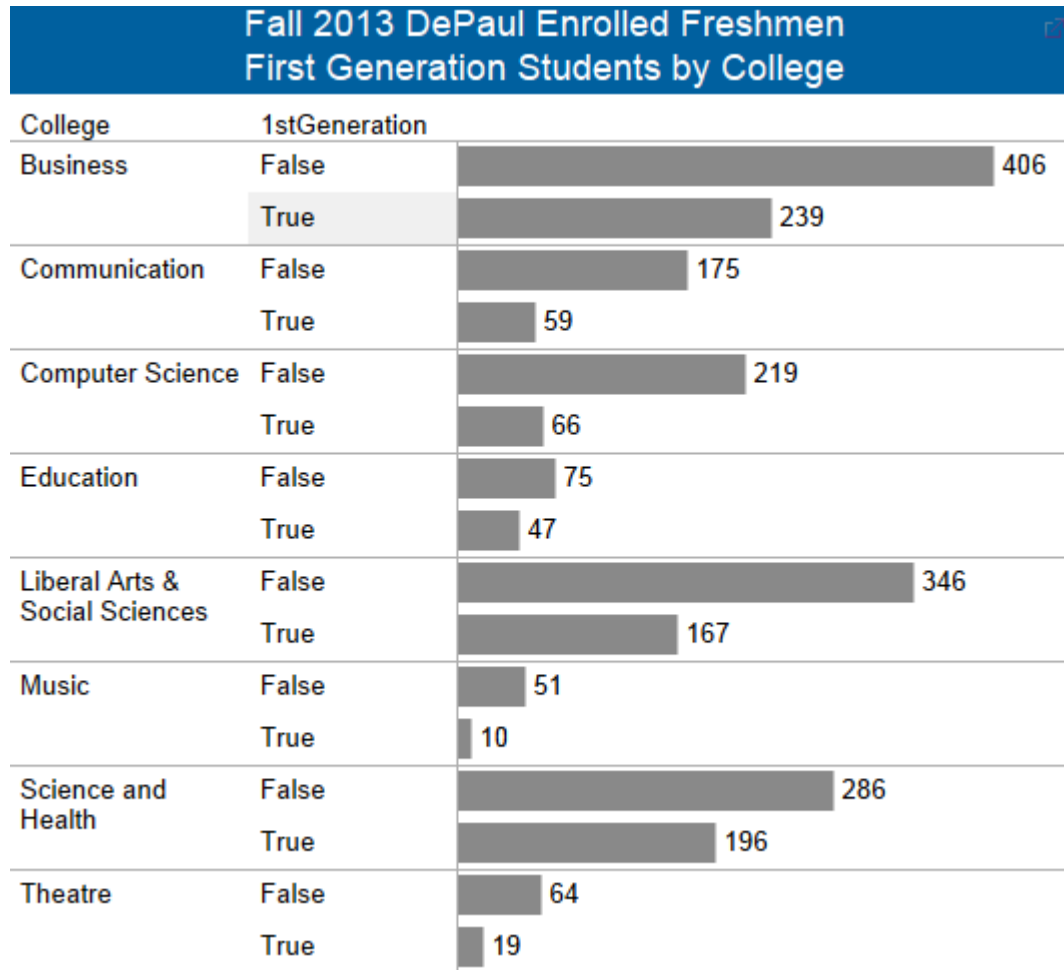
Sort by size when possible



Include a descriptive title



Include labels as close to data as possible



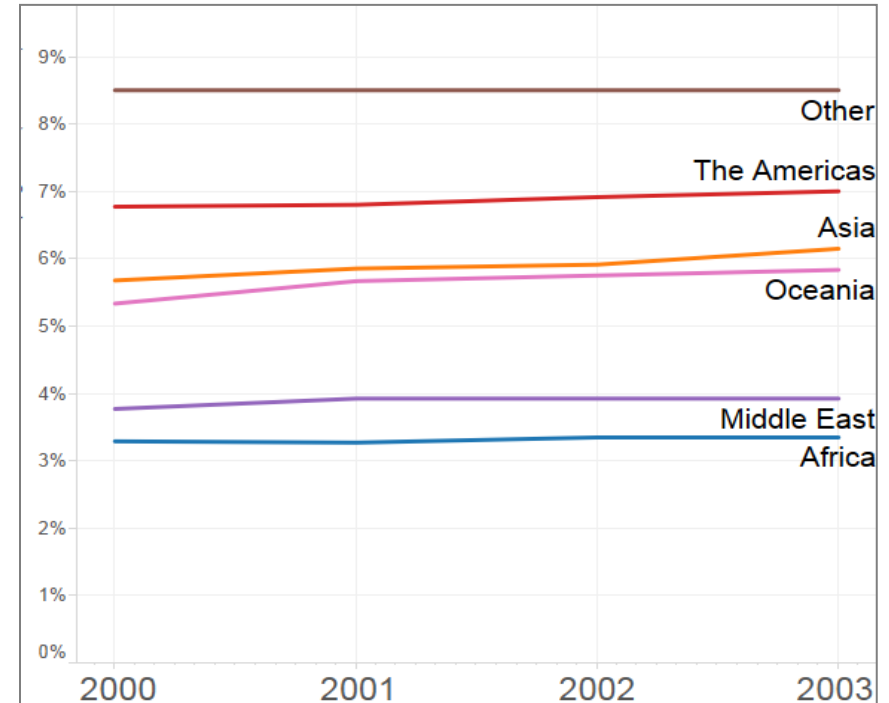
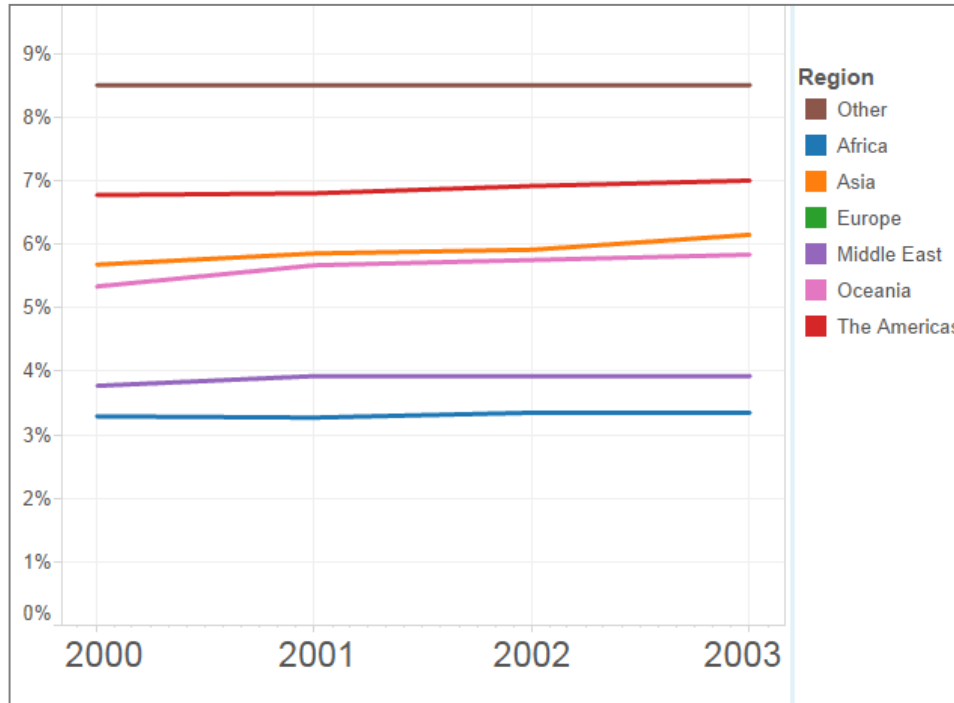
Hide field labels, edit aliases if needed

Fall 2013 DePaul Enrolled Freshmen First Generation Students by College		
Business	Non-1st Gen	406
	First Gen	239
Communication	Non-1st Gen	175
	First Gen	59
Computer Science	Non-1st Gen	219
	First Gen	66
Education	Non-1st Gen	75
	First Gen	47
Liberal Arts & Social Sciences	Non-1st Gen	346
	First Gen	167
Music	Non-1st Gen	51
	First Gen	10
Science and Health	Non-1st Gen	286
	First Gen	196
Theatre	Non-1st Gen	64
	First Gen	19

Incorporate legend into chart if possible

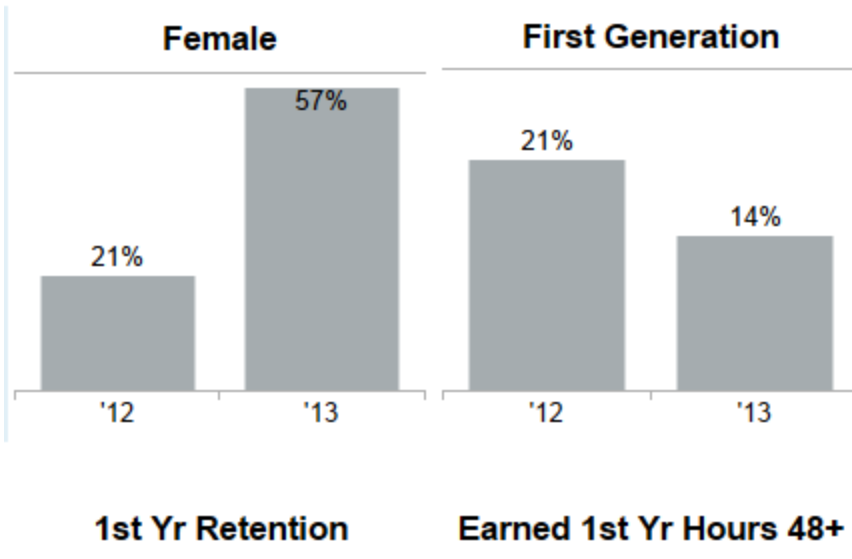
[Don't]

[Do]

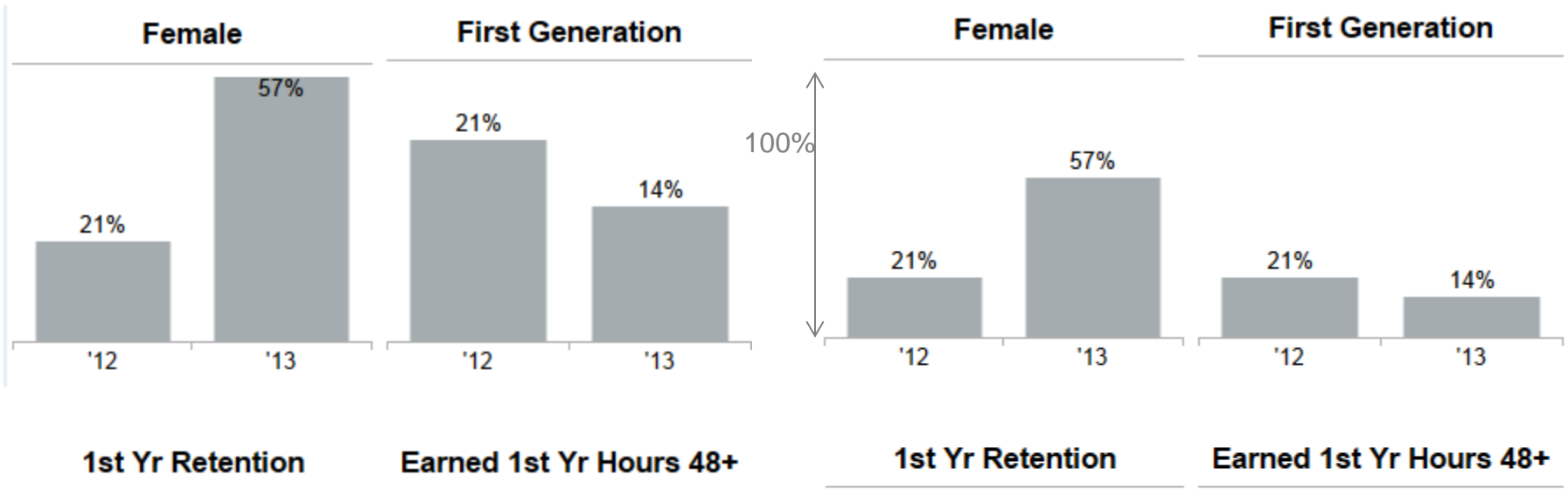


Fix the scale on all sheets, so it is easy for the user to make comparisons

[Don't]



[Do]



Use shading to draw the users eye down or across the data.
Right align data and column headers.

Freshmen												
	Apps			Admits			Deposits			Enrollments		
College	2006	2007	% Chg	2006	2007	% Chg	2006	2007	% Chg	2006	2007	% Chg
Business	2,509	2,922	16%	1,923	2,066	7%	864	867	0%	793	756	-5%
Music	498	605	21%	407	486	19%	153	170	10%	127	150	18%
CTI	598	693	16%	419	397	-5%	210	178	-15%	198	158	-20%
Education	703	894	27%	480	532	11%	162	175	8%	135	148	10%
LA&S	4,983	5,975	20%	3,753	4,101	9%	1,313	1,362	4%	1,133	1,156	2%
Total	9,291	11,089	19%	6,982	7,582	9%	2,702	2,752	2%	2,386	2,368	-1%

Freshmen												
	Apps			Admits			Deposits			Enrollments		
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Business	2,509	2,922	16%	1,923	2,066	7%	864	867	0%	793	756	-5%
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Use color with caution, it may draw the user's eye to something that is not important. Using one muted color in a dashboard helps the user focus on the actual data rather than the different colors.

[Don't]

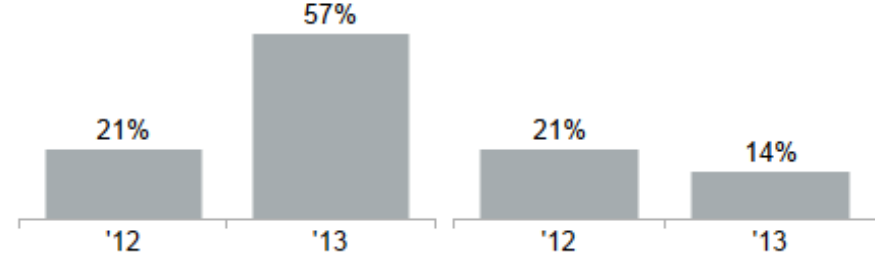
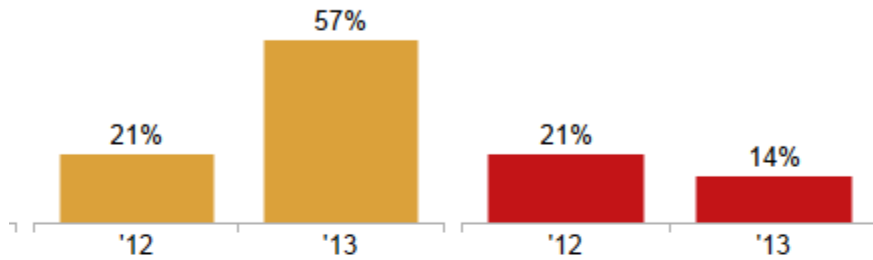
[Do]

Female

First Generation

Female

First Generation

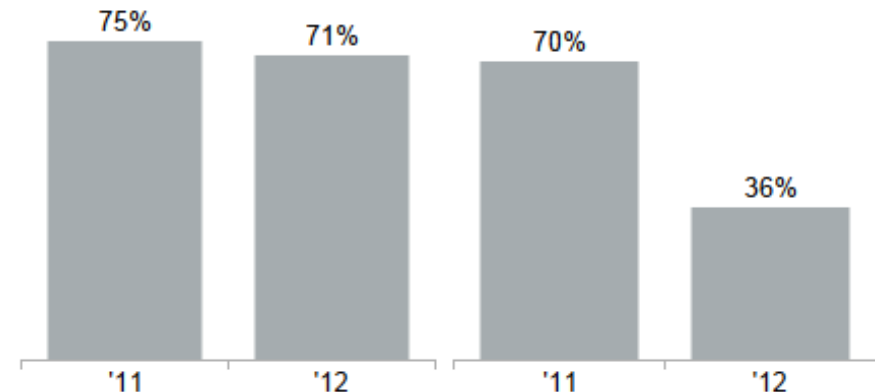
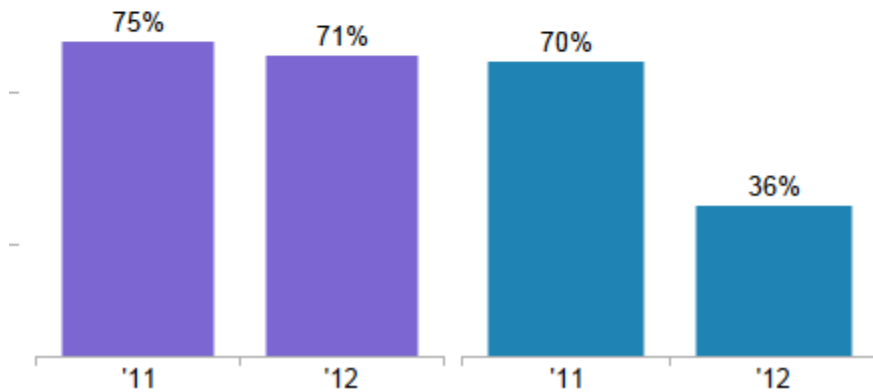


1st Yr Retention

Earned 1st Yr Hours 48+

1st Yr Retention

Earned 1st Yr Hours 48+

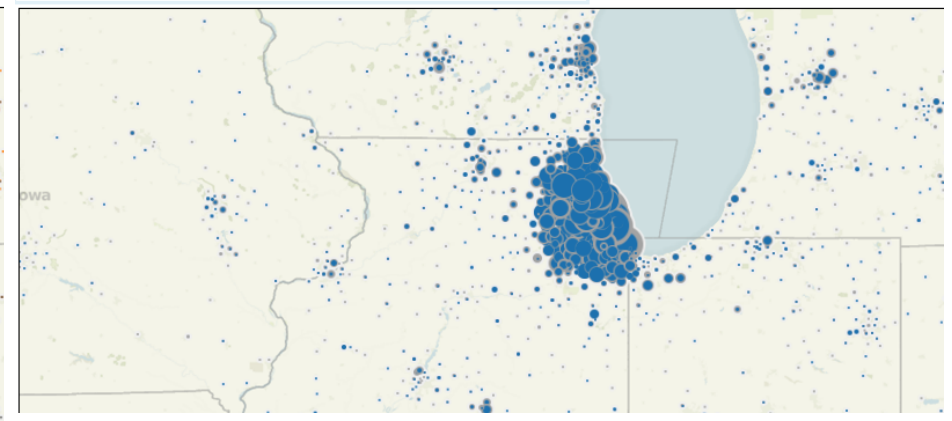
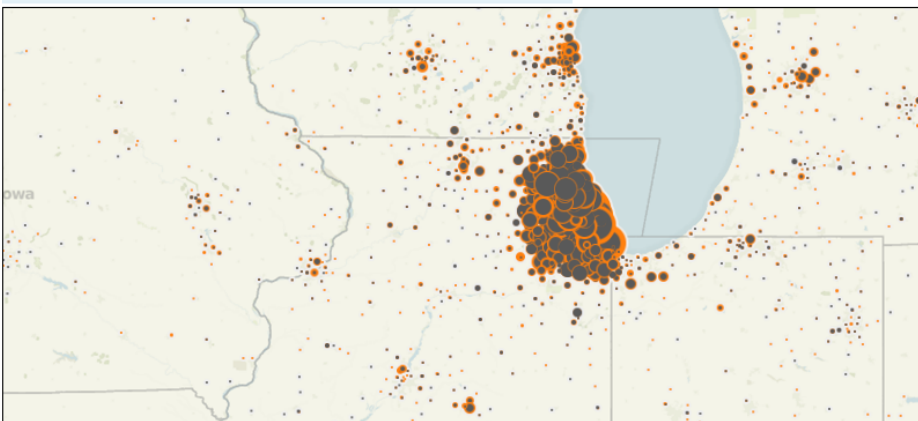
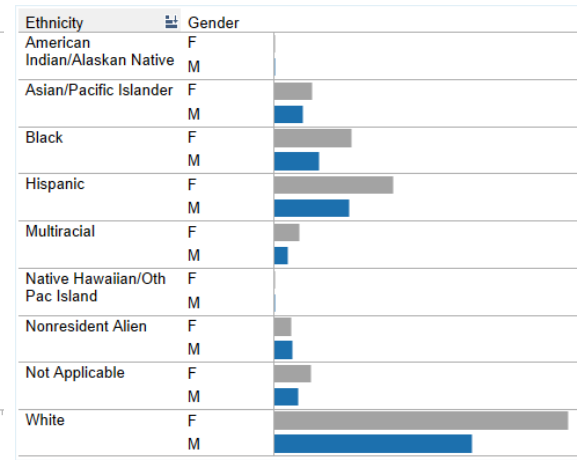
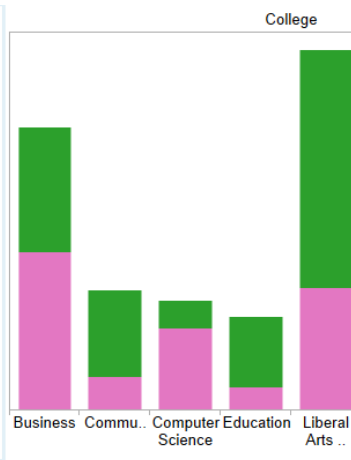
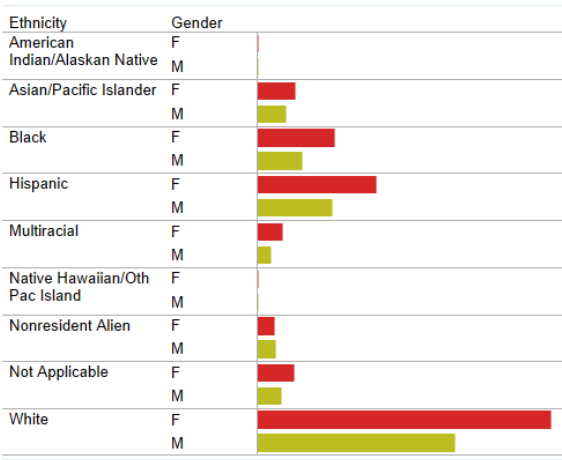


Use the same color scheme throughout your dashboard and use color to draw focus on important information

[Don't]

information

[Do]



Be careful not to mix colors with their standard associations.

YELLOW	BLUE	ORANGE
BLACK	RED	GREEN
PURPLE	YELLOW	RED
ORANGE	GREEN	BLACK
BLUE	RED	PURPLE
GREEN	BLUE	ORANGE



Increase 25%

Guidelines for fonts

- DON'T USE ALL UPPERCASE *or all italics* **or all bold**
- Only change color for **emphasis** or to **group words together**
- Underlined text can be hard to read
- *Don't use fancy fonts*
- Make sure font is large enough to read easily

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Place the most important information in the top left corner of the dashboard

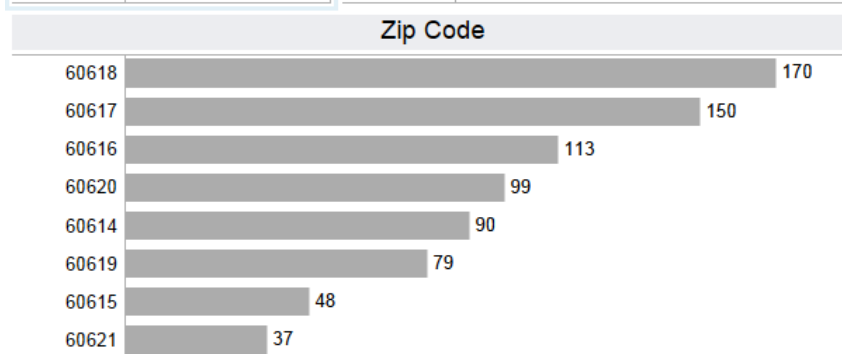
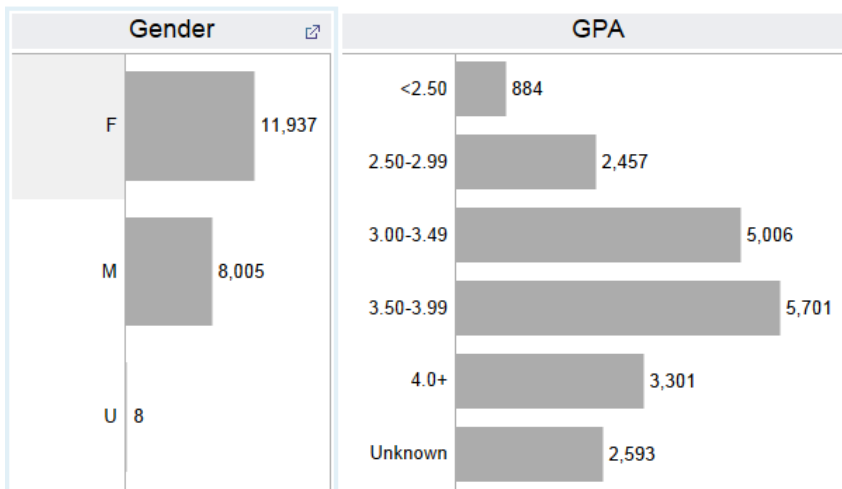


Source: <http://googleblog.blogspot.com/2009/02/eye-tracking-studies-more-than-meets.html>.

Group relevant worksheets together on the dashboard

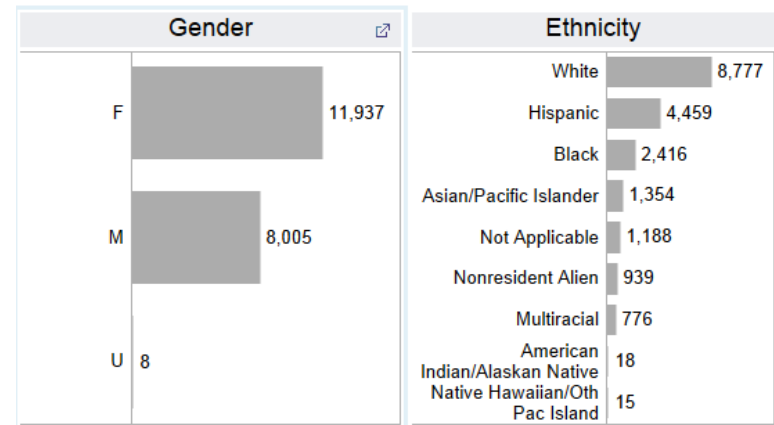
[Don't]

Student Characteristics

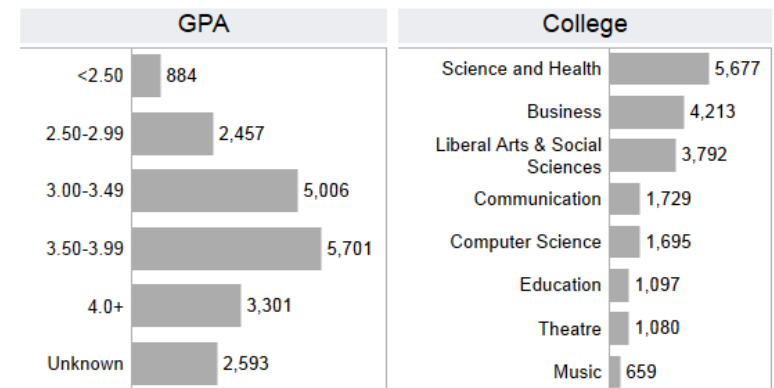


[Do]

Demographics

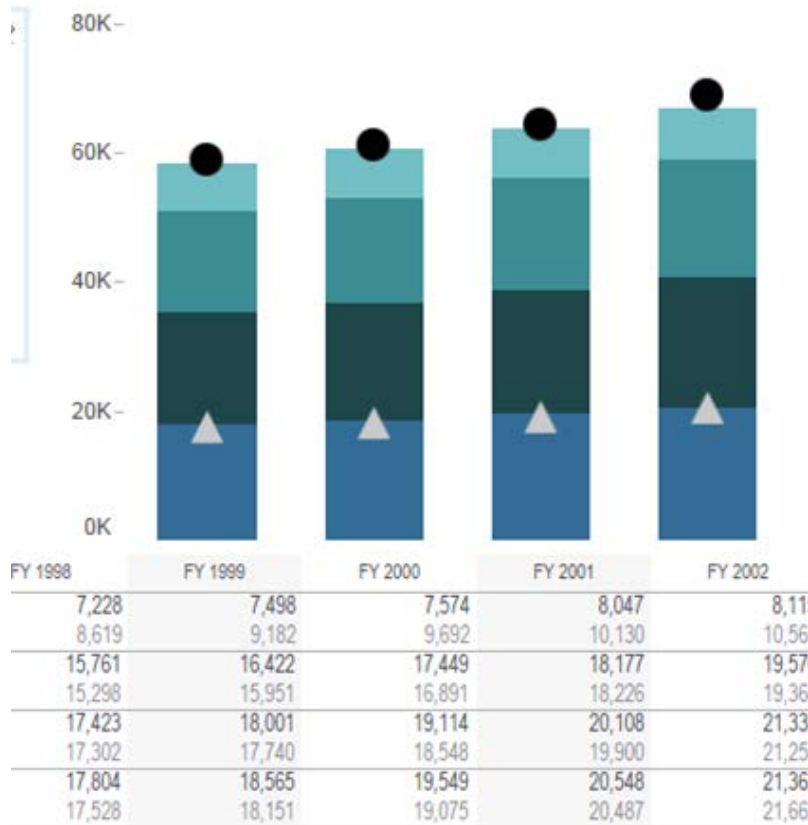


Academics

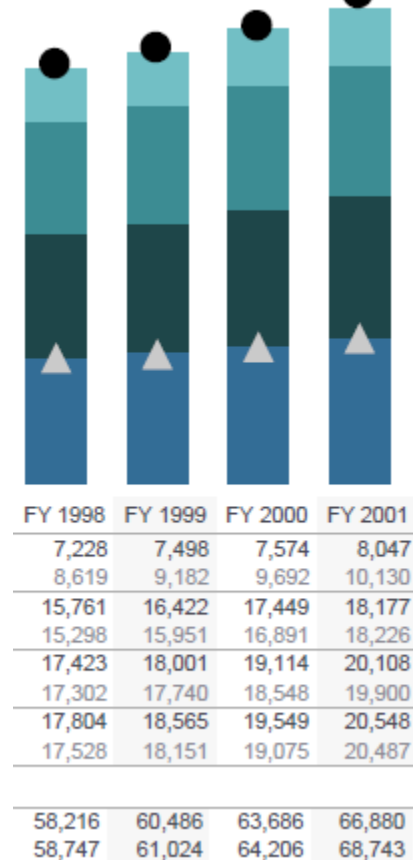


Use fixed size dashboard to ensure a consistent layout on different screens

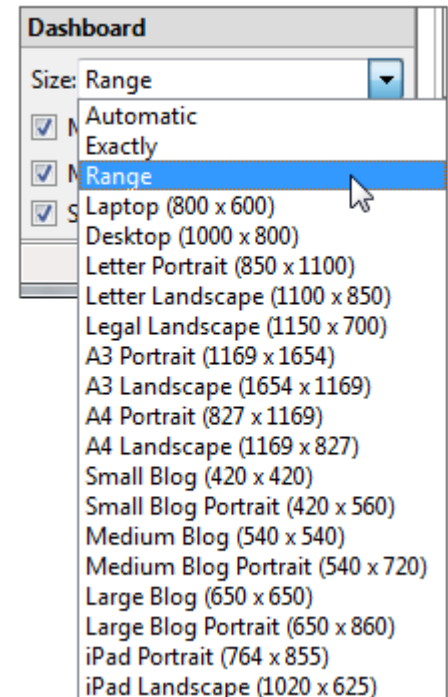
[Don't] – Automatic



[Do] - Fixed



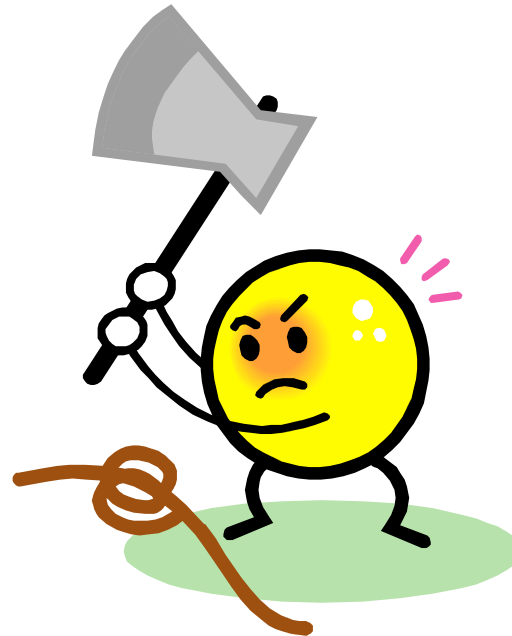
How to change in v. 8.0





“Perfection is achieved, not when there is nothing more to add, but when there is nothing left to take away.”

Antoine de Saint-Exuper



Use only relevant information on dashboard, eliminate as much as possible

[Don't]

Category	11/12 Inq	12/13 Inq	Inq # Chg	Inq % Chg
Purchased List	14,941	20,308	5,367	36%
Score Sender	8,509	7,609	-900	-11%
Fair	7,235	7,324	89	1%
Non-DPU Site	5,724	6,591	867	15%
Application	6,242	6,455	213	3%
Advertising	4,249	5,608	1,359	32%
DPU Website	3,820	3,703	-117	-3%
Group Visits	2,796	3,292	496	18%
Daily Visits	1,926	2,817	891	46%
Online Fair	1,080	1,911	831	77%
HS Visit	1,608	1,906	298	19%
Other	814	1,413	599	74%
Acquired List	1,216	691	-525	-43%
On-Camp Event	396	464	68	17%
International	449	254	-195	-43%
Inbound Contact	510	225	-285	-56%
Walk-In	328	82	-246	-75%
Off-Camp Event	61	38	-23	-38%
CC Visit	62	29	-33	-53%
Referral	32	10	-22	-69%
Unknown	5	5	0	0%
Inactive	4	4	0	0%
Total	62,007	70,739	8,732	14%

[Do]

Category	12/13 Inq	Inq # Chg
Purchased List	20,308	5,367
Score Sender	7,609	-900
Fair	7,324	89
Non-DPU Site	6,591	867
Application	6,455	213
Advertising	5,608	1,359
DPU Website	3,703	-117
Group Visits	3,292	496
Daily Visits	2,817	891
Online Fair	1,911	831
HS Visit	1,906	298
Other	1,413	599
Acquired List	691	-525
On-Camp Event	464	68
International	254	-195
Inbound Contact	225	-285
Walk-In	82	-246
Off-Camp Event	38	-23
CC Visit	29	-33
Referral	10	-22
Unknown	5	0
Inactive	4	0
Total	70,739	8,732

Example Dashboard

College Of DuPage, IL New Transfer Students

Admission & Enrollment Activity

	Applicants	Admits	Enrollments	Admit Rt*	Yield Rt**	5-Year Fall Enrollment Trend	Top Majors (4 Quarters)
Summer	17	12	5	71%	42%		Undecided 33
Fall	409	279	160	68%	57%		Finance 20
Winter	140	104	57	74%	55%		Accountancy 18
Spring	42	27	16	64%	59%		Computer Science 11
Total	608	422	238	69%	56%		Business Administration 10

Demographic Profile of New Enrolled Students

	Female	Age 24+	African American	Asian/Pac Island	Hispanic/Latino	Caucasian	Other***
Summer	20%	100%		20%	20%	60%	
Fall	43%	22%	4%	10%	11%	66%	9%
Winter	54%	23%	2%	28%	11%	47%	12%
Spring	44%	44%		13%	31%	38%	19%
Total	45%	25%	3%	15%	12%	60%	11%

Academic Profile of New Enrolled Students

	Business	Communication	Computer Science	Education	Liberal Arts & Soc. Sci.	School for New Learning	Science & Health	Music or Theatre	Ave Incoming GPA [^]	Fall Retention & Graduation ^{^^}
Summer		1				3	1	Fall 3.0	1st Yr Retention 89.4%	
Fall	59	14	29	2	27	12	15	Winter 2.7	4-Yr Graduation 68.9%	
Winter	9	5	9	1	10	7	16	Spring 2.8	5-Yr Graduation 74.4%	
Spring	4	1	4		2	5		Total 2.9	Avg. 4-Yr Grad GPA 3.3	
Total	72	21	42	3	39	27	32		Avg. 5-Yr Grad GPA 3.3	

DePaul ranked as the #2 transfer destination for College Of DuPage students to 4-year institutions, based on Fall 2011 IBHE data.

Notes: *Percent of total applicants (includes incompletes) who were admitted; **Percent of admitted who enrolled; ***Other includes Native American, International, Multiracial and unknown; ^From all college transcripts, not including School for New Learning (SNL), excludes terms with fewer than 3 available GPAs; ^^Fall only, students with 45 or more transferred credit hours, not including SNL.

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- 6. Test for understanding**



Are the main takeaways clear?

Are the charts clear and understandable?

Are the right metrics used?

Is anything missing? Can anything be removed?

Dashboard design is a process, may require several cycles of adjustments



For more information...

Karolynn Horan

Institutional Research & Market Analytics

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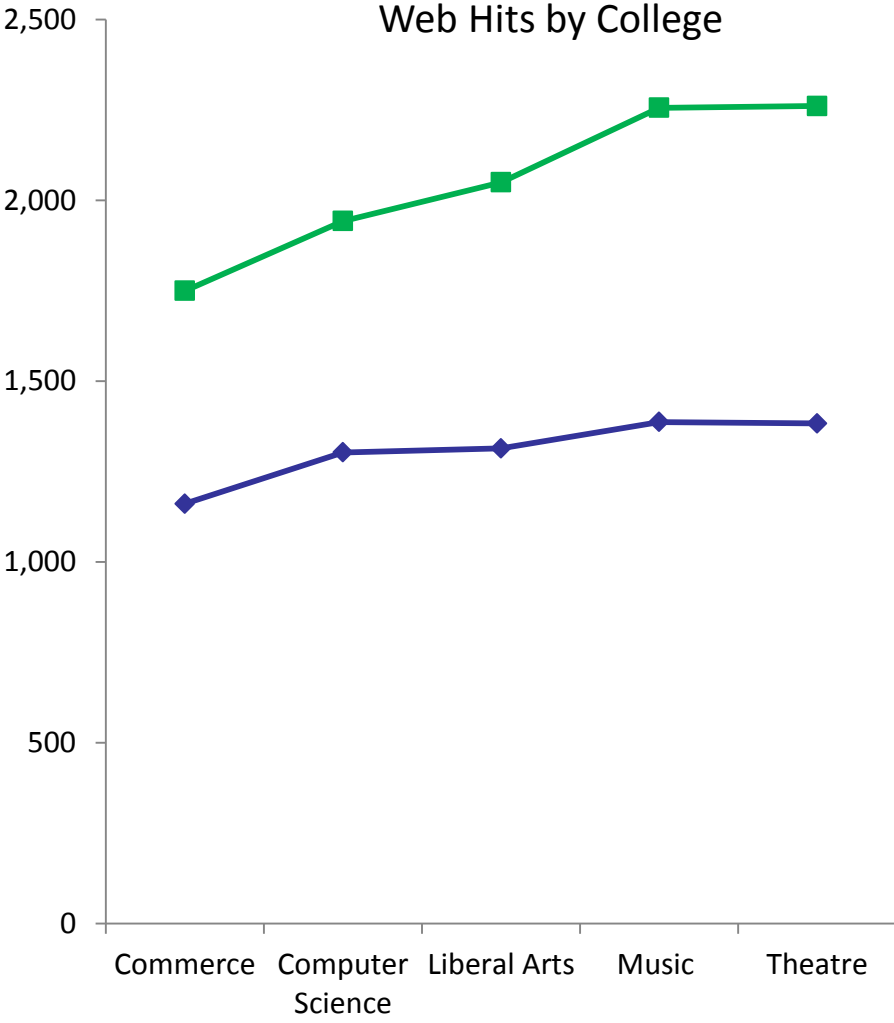
Appendix



Use bar graphs when the scale is not continuous

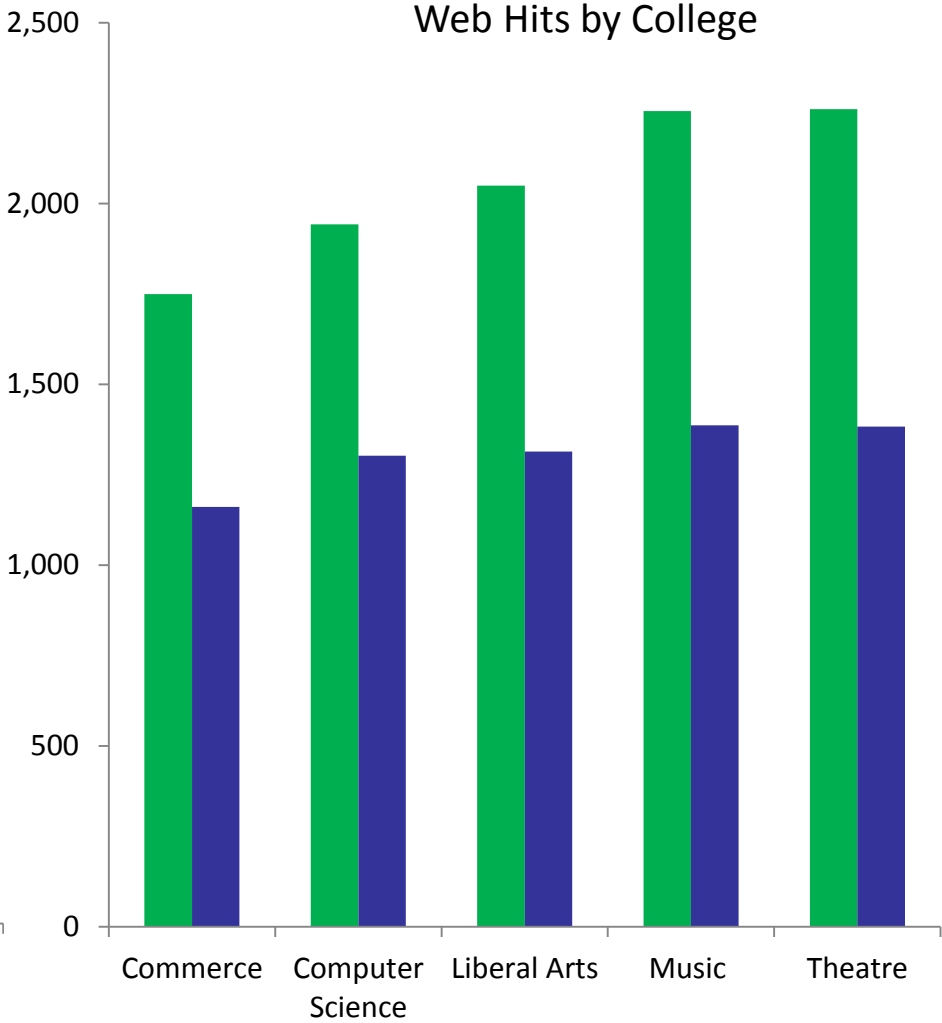
[Don't]

Web Hits by College



[Do]

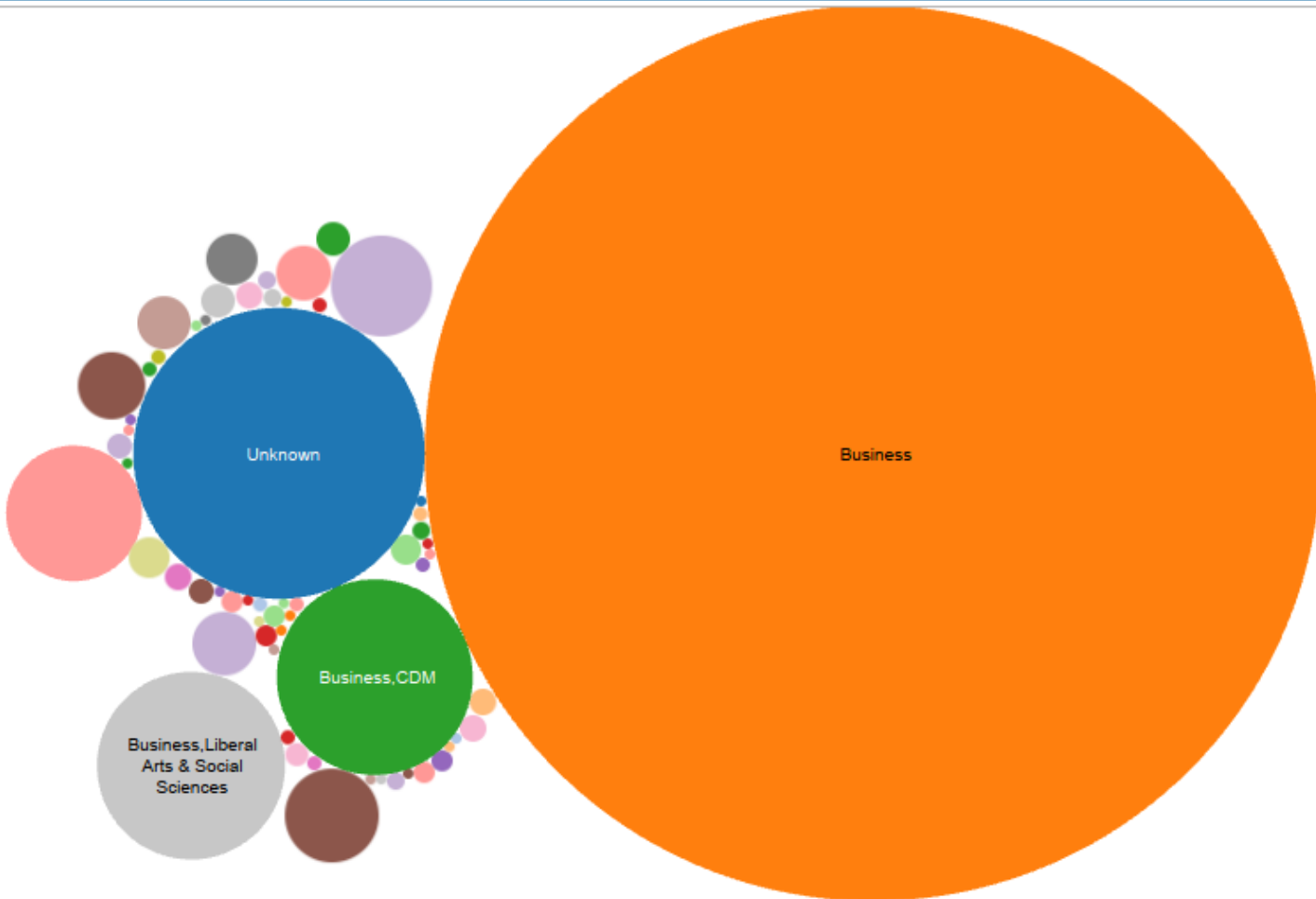
Web Hits by College



Packed Bubbles can be an interesting way to show interaction between variables

Masters 12/13 Inquiries by College Overlap

How many students inquire for only one college and how many inquire for multiple colleges?

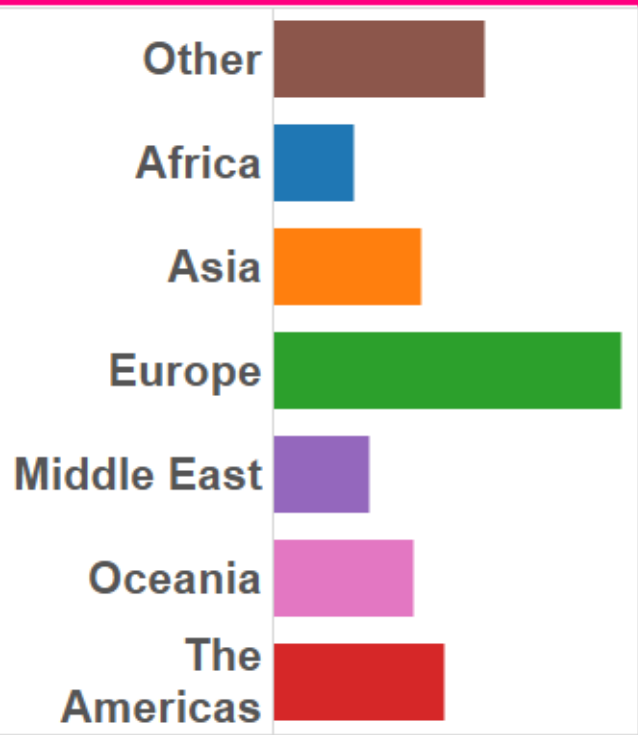


Guidelines for fonts

Use either serif or sans serif fonts, but use consistently

Bell MT
Bodoni
Courier New
Garamond
Georgia
Goudy Old Style

Arial
Century Gothic
Franklin Gothic
Gill Sans
Lucida Sans
Tahoma
Trebuchet
Verdana



Don't use flashy backgrounds!