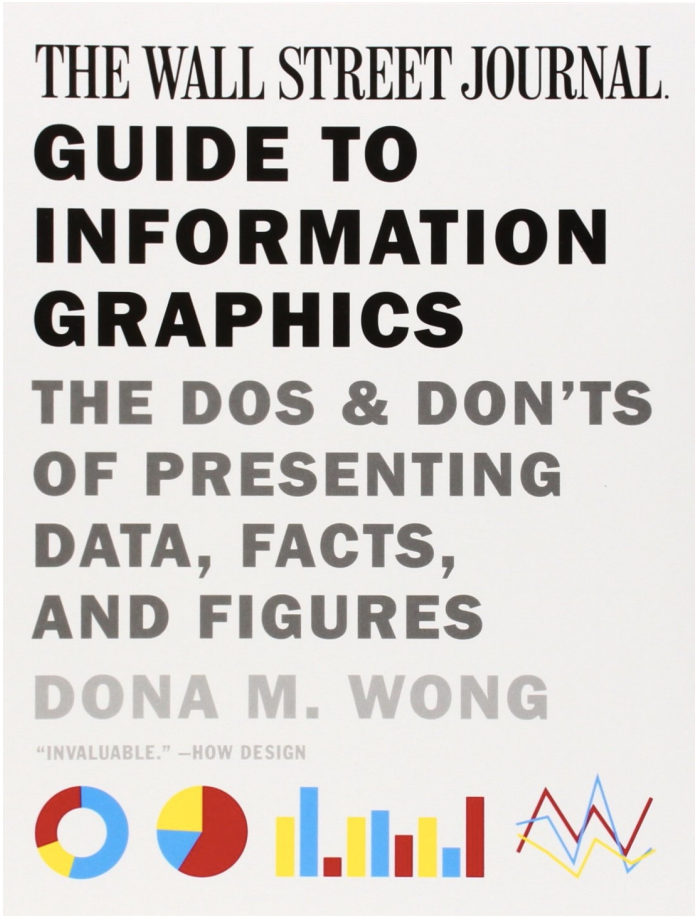
6 CHARTING TAXONOMY

S. Rinzivillo – rinzivillo@isti.cnr.it

CRASH COURSE ON EFFECTIVE CHARTING



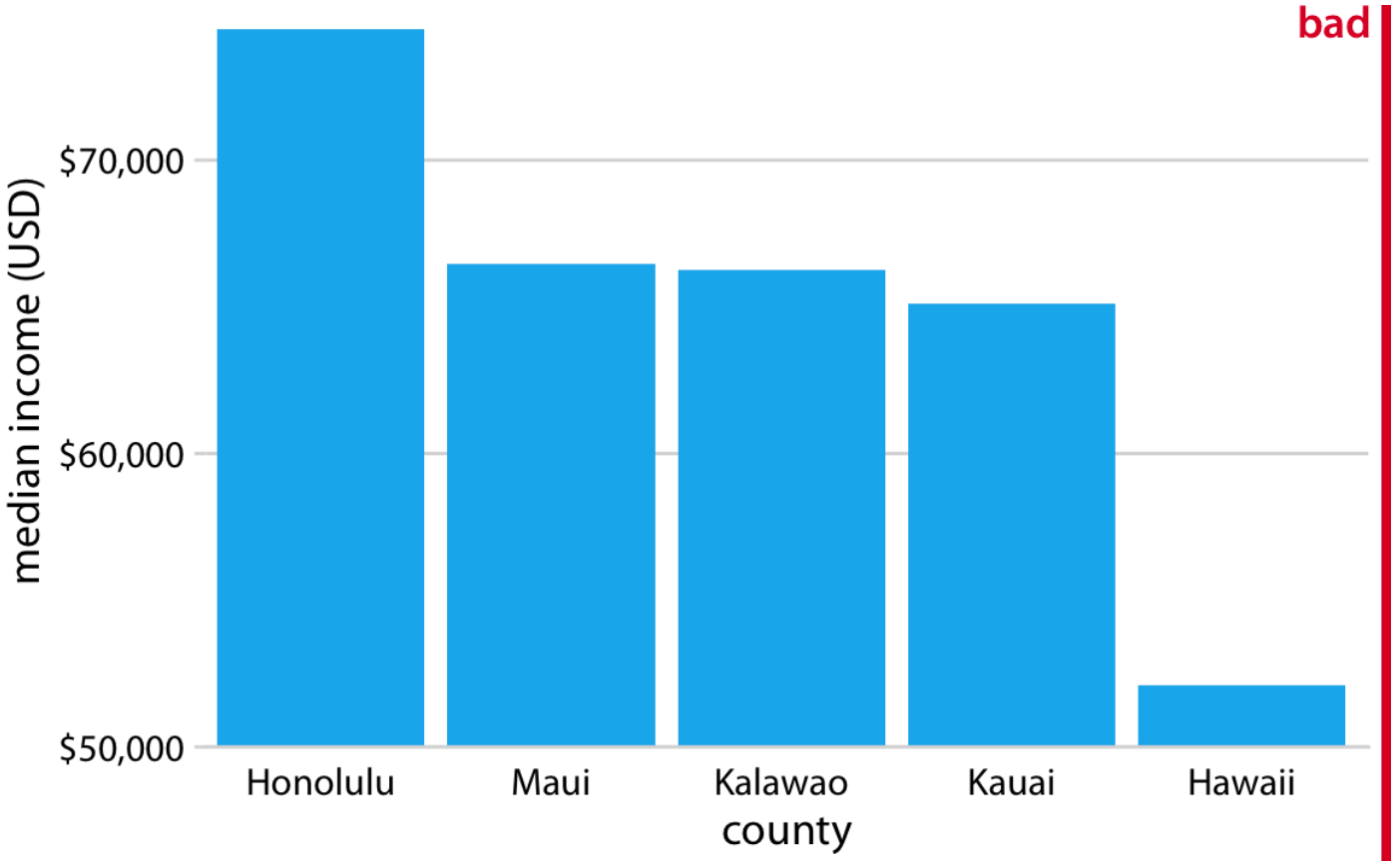
Dona M. Wong

Guide to Information Graphics

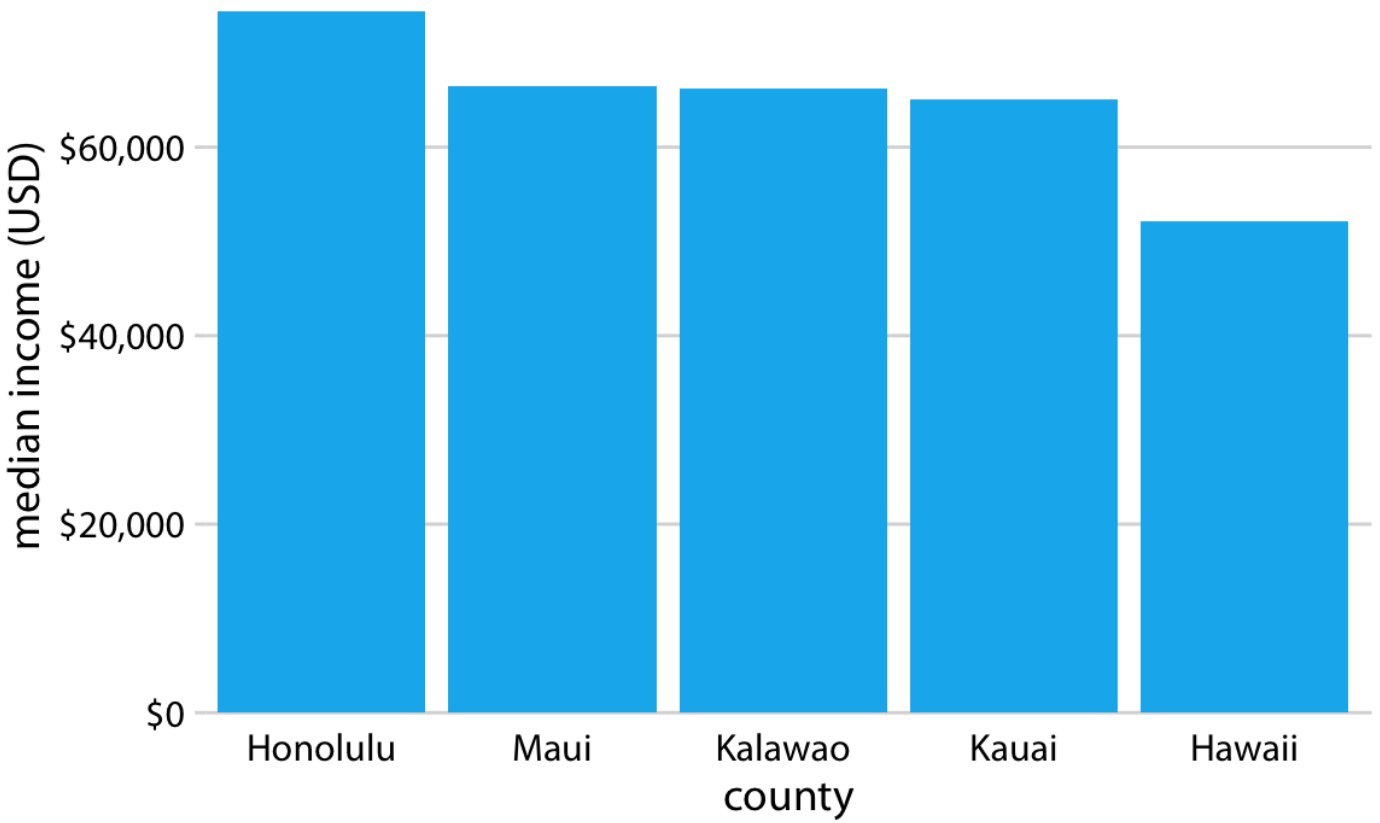
The Dos and Don'ts of Presenting Data, Facts, and Figures

W. W. Norton & Company

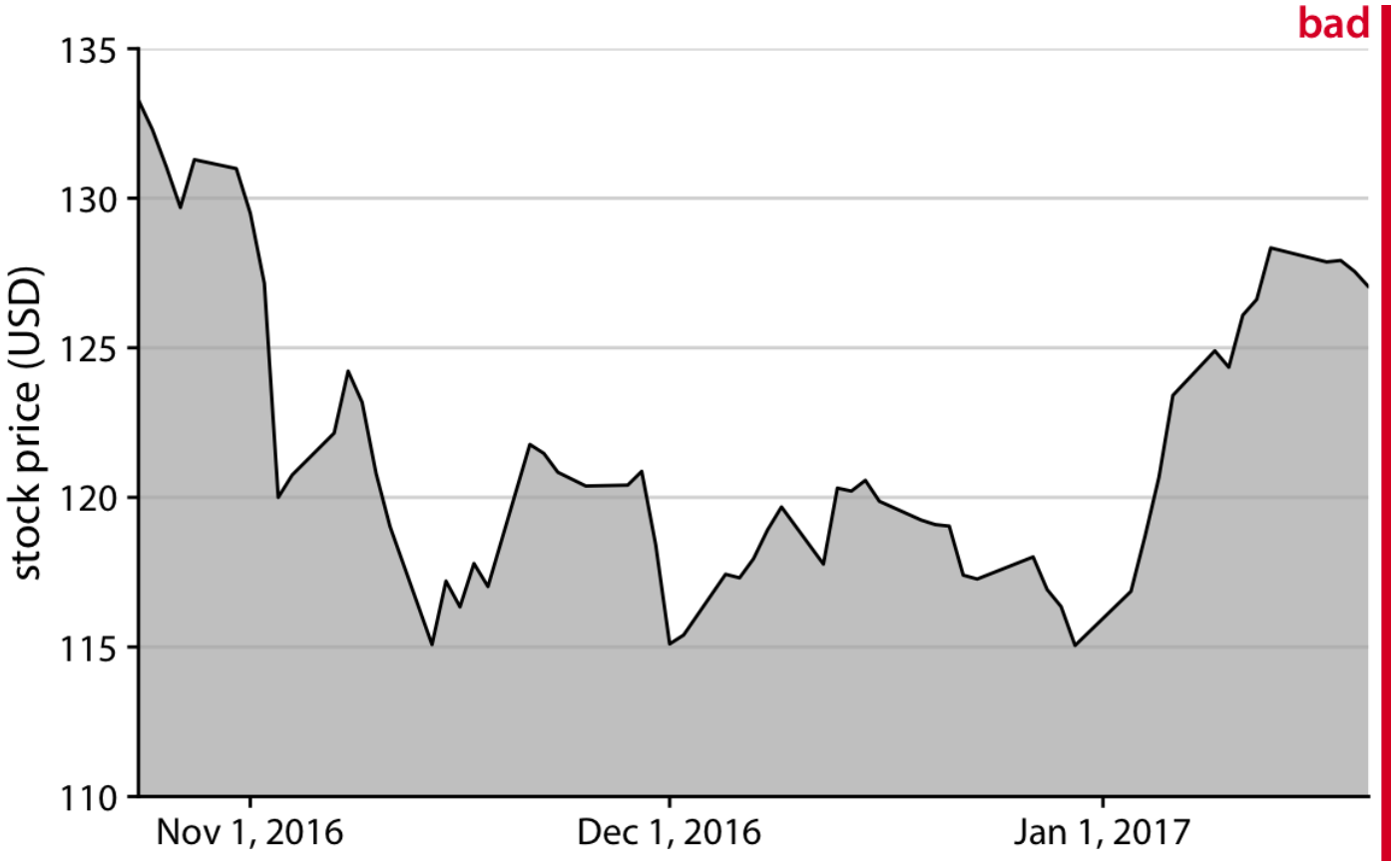
CHARTING EXAMPLES



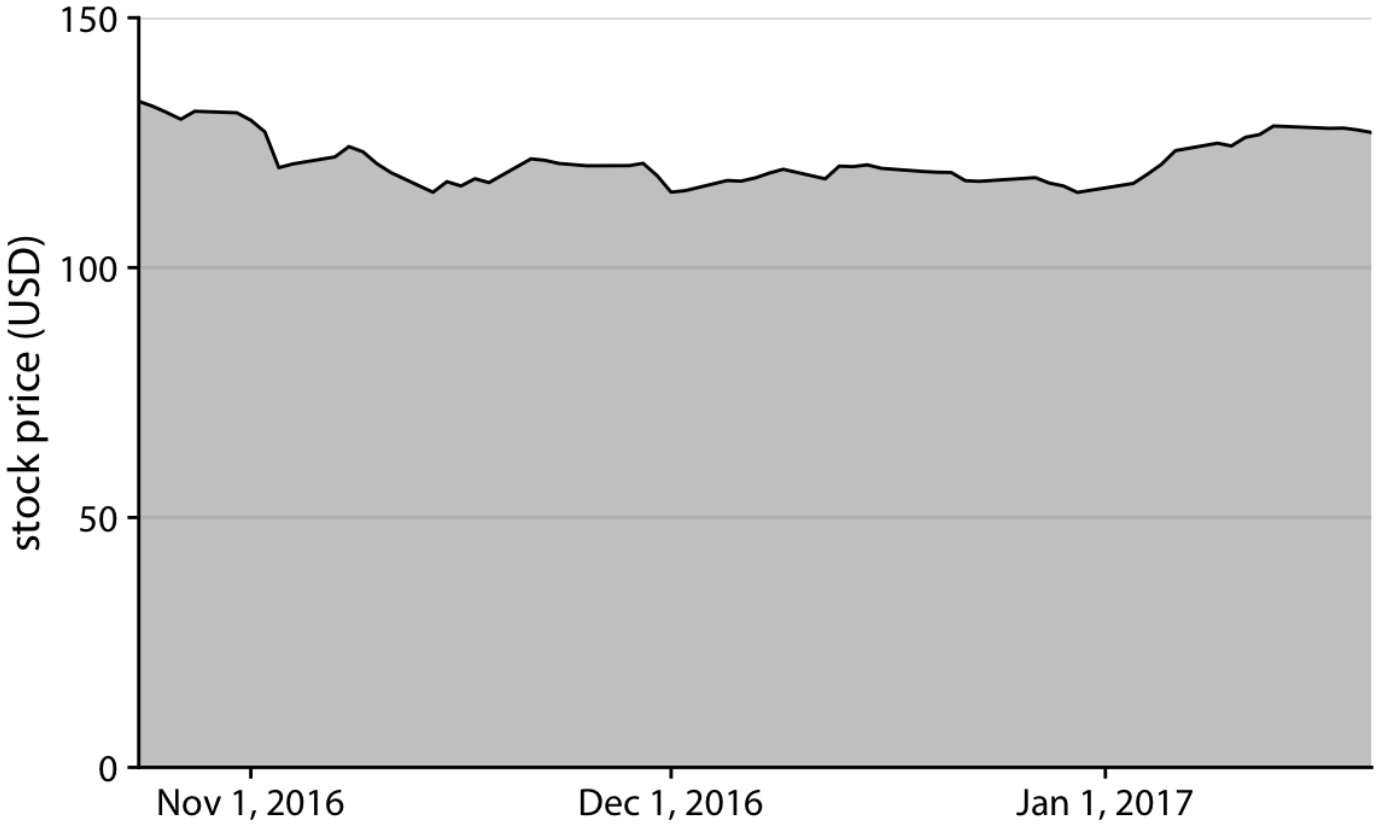
CHARTING EXAMPLES



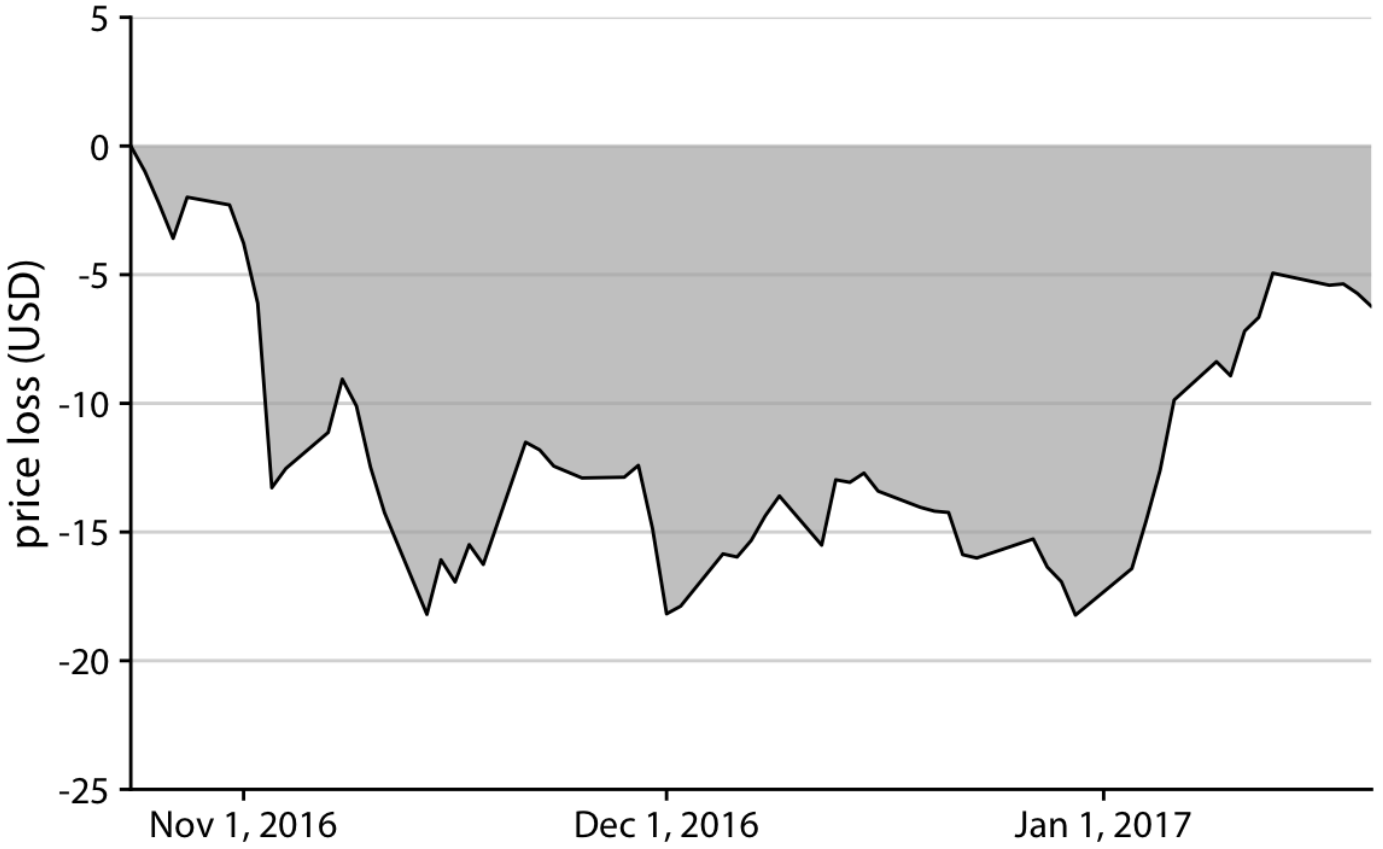
CHARTING EXAMPLES



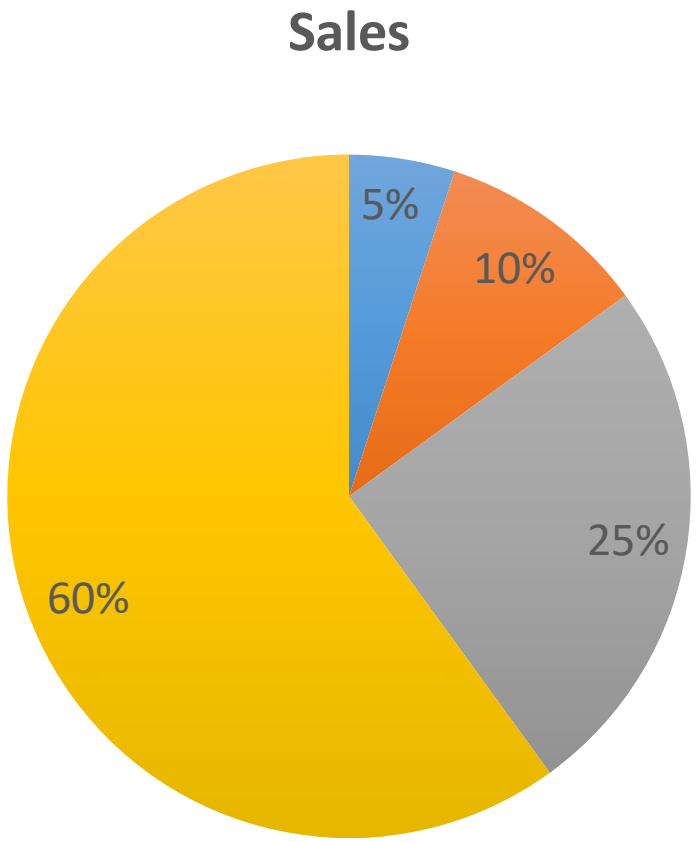
CHARTING EXAMPLES

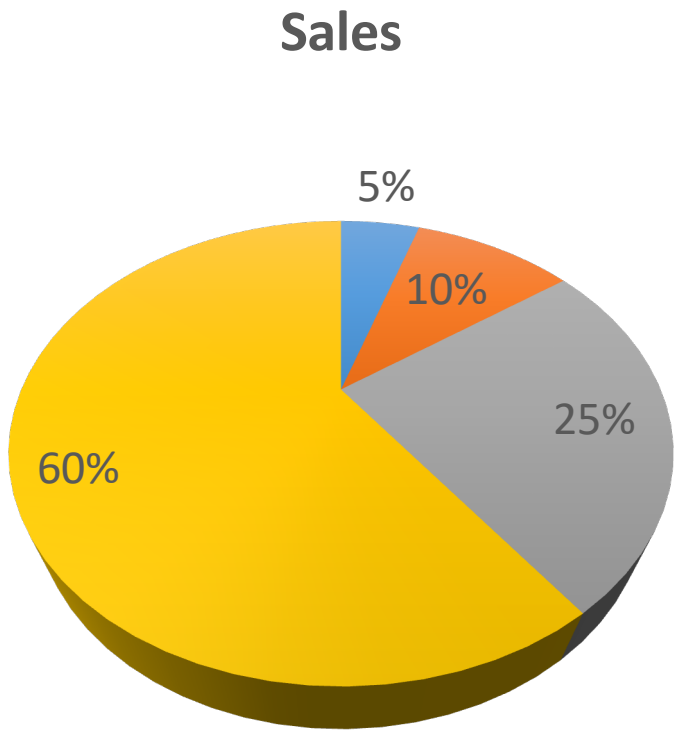


CHARTING EXAMPLES



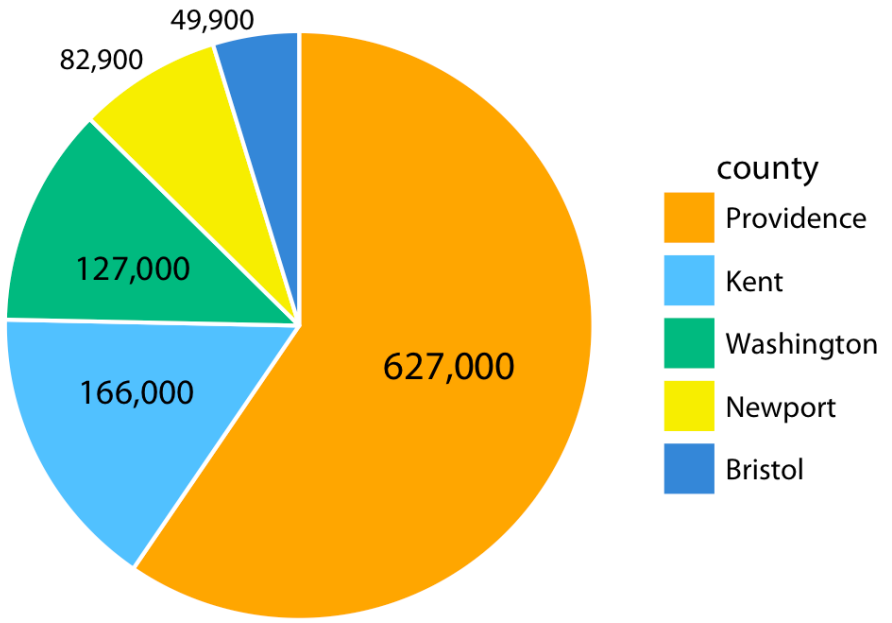
CHARTING EXAMPLES

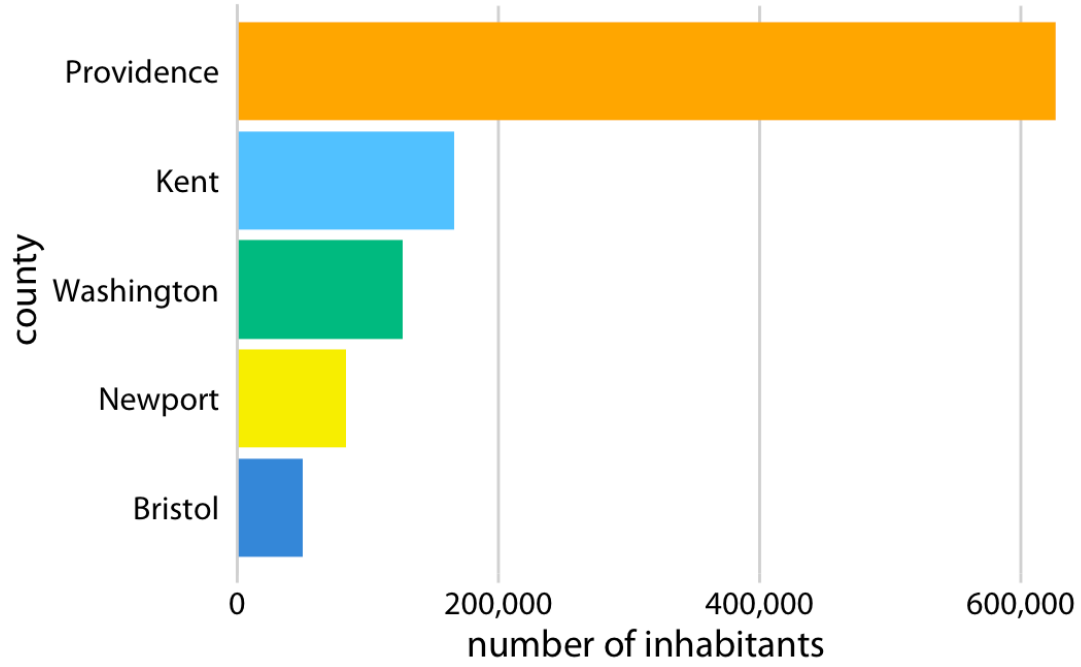




May these charts be improved? Why? How?

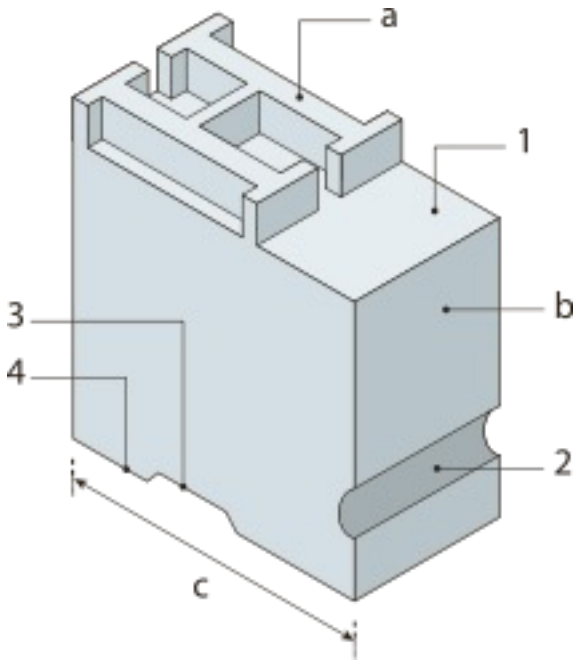
CHARTING EXAMPLES

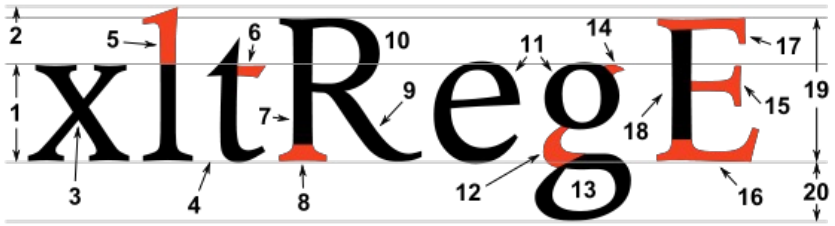




FONTS

FONTS





Typographic parts of a glyph:
1) x-height; **2) ascender line**; 3) apex; **4) baseline;** 5) ascender; 6) crossbar; 7) stem; **8) serif;** 9) leg; 10) bowl; 11) counter; 12) collar; 13) loop; 14) ear; 15) tie; 16) horizontal bar; 17) arm; 18) vertical bar; 19) cap height; **20) descender line.**

Font size = (1) + (2) + (20)
= (19) + (20)

FONTS: GENERAL RULES

- Leading should be 2 points larger then type size
- Avoid too small or condensed type faces
- Keep style simple: use **bold** or *italic* to emphasize a word (better not ***both***)

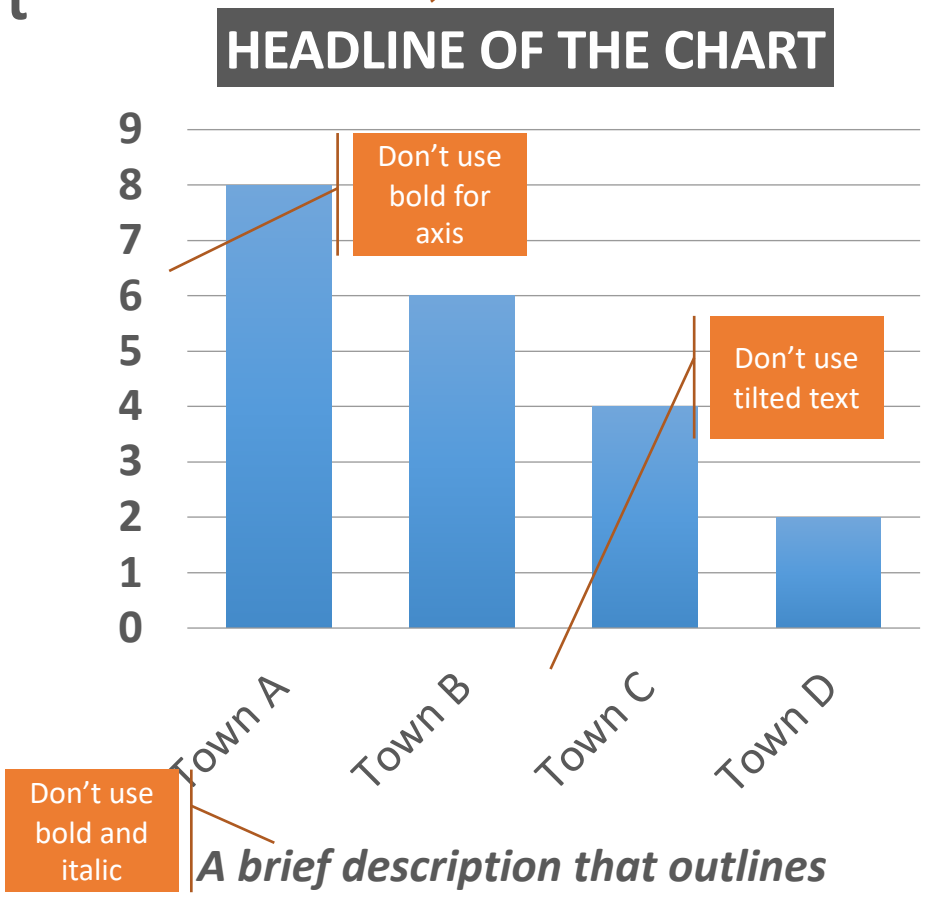
- Avoid ALL CAPS
- Avoid *styled fonts*
- Avoid C***C Sans Serif
- Reduce type at an angle
- Avoid t r a c k i n g

Fonts are meant to describe, not to adorn

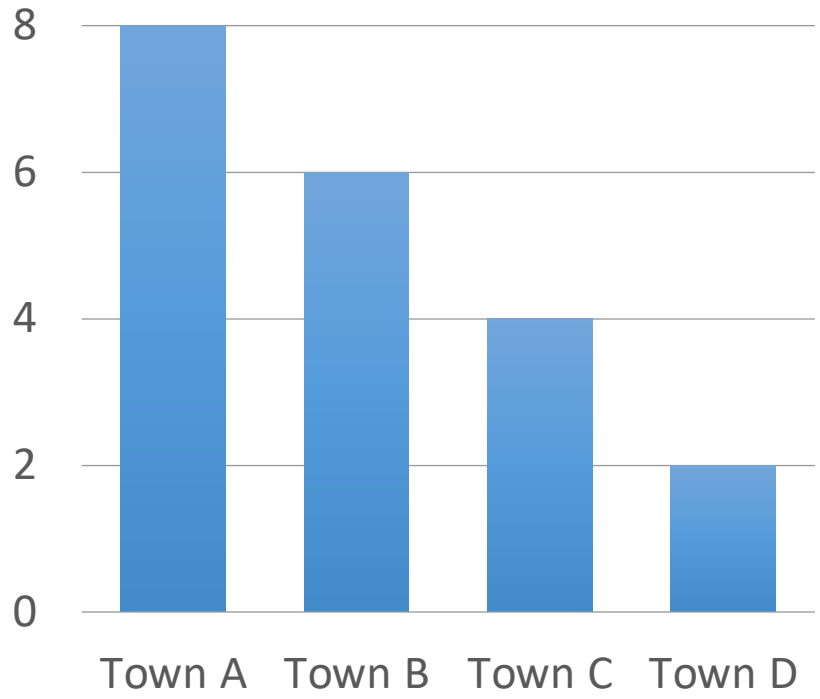
TYPOGRAPHY IN CHARTS

Don't use all caps or high contrast white type out of black

Don't

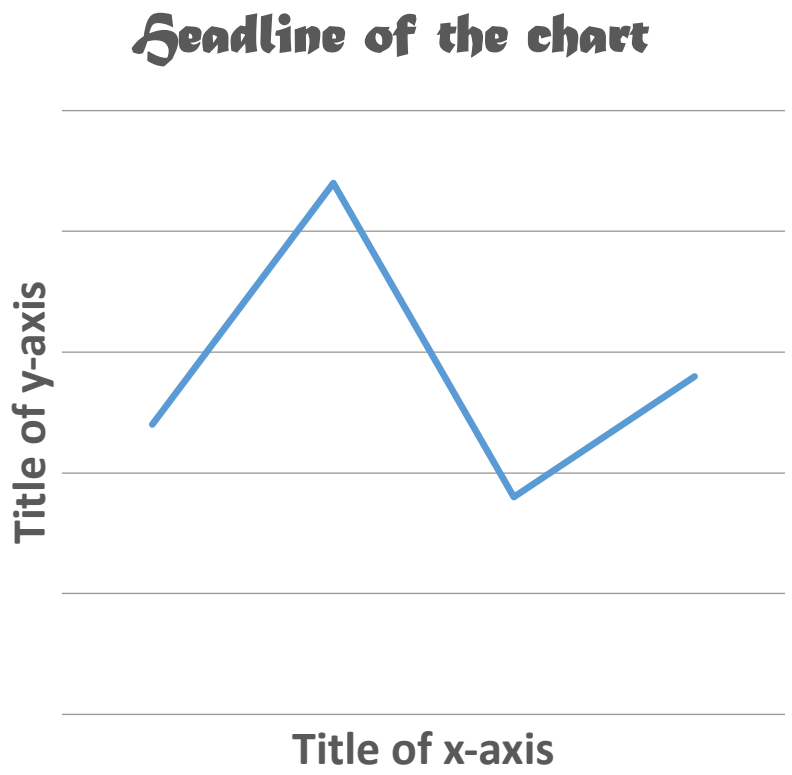


Do



TYPOGRAPHY IN CHARTS

Don't



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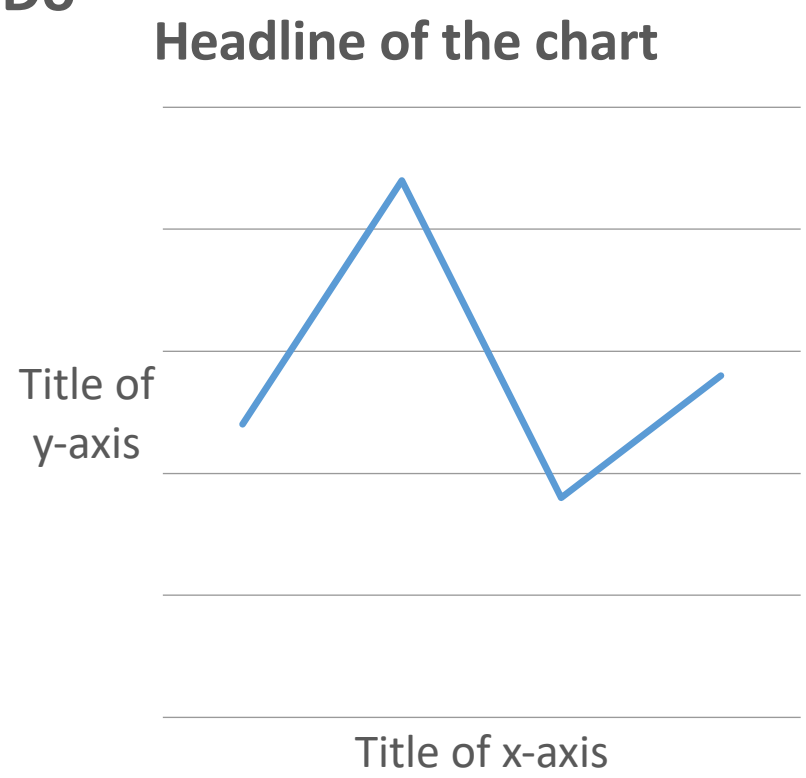


TYPOGRAPHY IN CHARTS

Name	Data	Data	Data
Company A	0.0	**0.0**	**0.0**
Company B	0.0	**0.0**	**0.0**
Company C	0.0	**0.0**	**0.0**
Company D	0.0	**0.0**	**0.0**

Many elements in bold. Which part is highlighted?

Name	Data	Data	Data
Company A	0.0	0.0	**0.0**
Company B	0.0	0.0	**0.0**
Company C	0.0	0.0	**0.0**
Company D	0.0	0.0	**0.0**

Give emphasis to relevant results

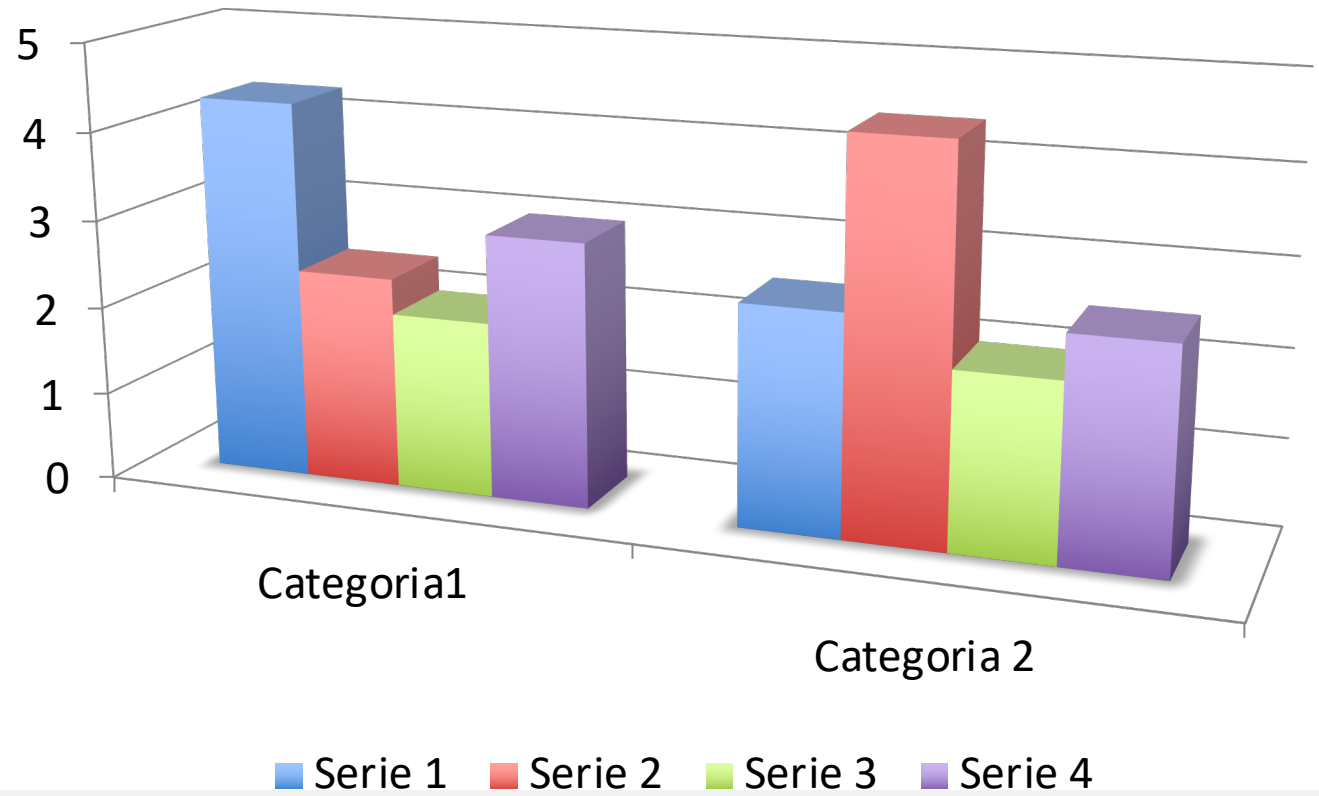
DATA-INK RATIO

Visual Display of Quantitative Data

Edward Tufte, 1983

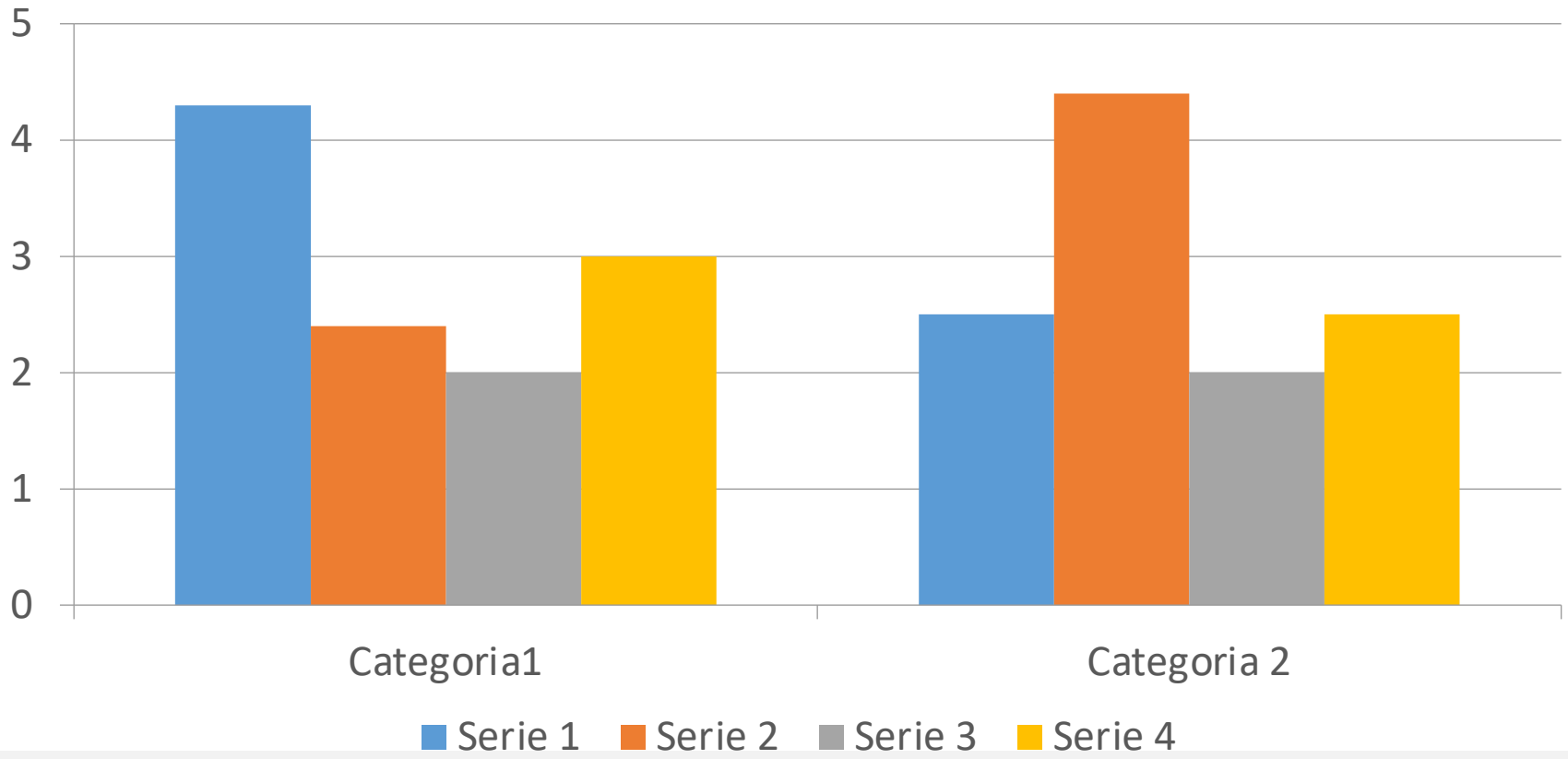
DATA-INK RATIO

$$\text{Data-Ink Ratio} = \frac{\text{Data ink}}{\text{Total ink used in graphic}}$$

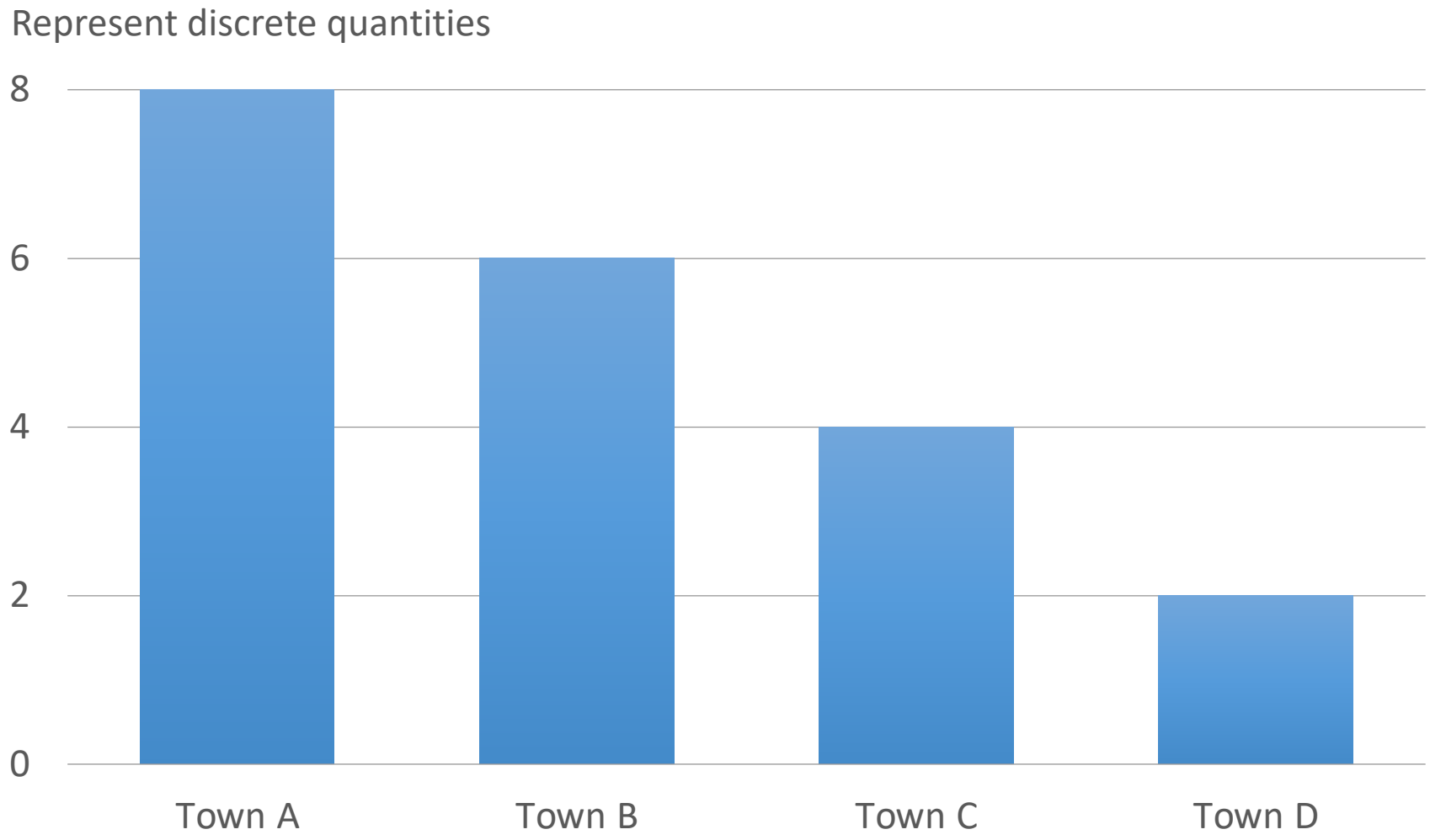


DATA-INK RATIO

$$\text{Data-Ink Ratio} = \frac{\text{Data ink}}{\text{Total ink used in graphic}}$$

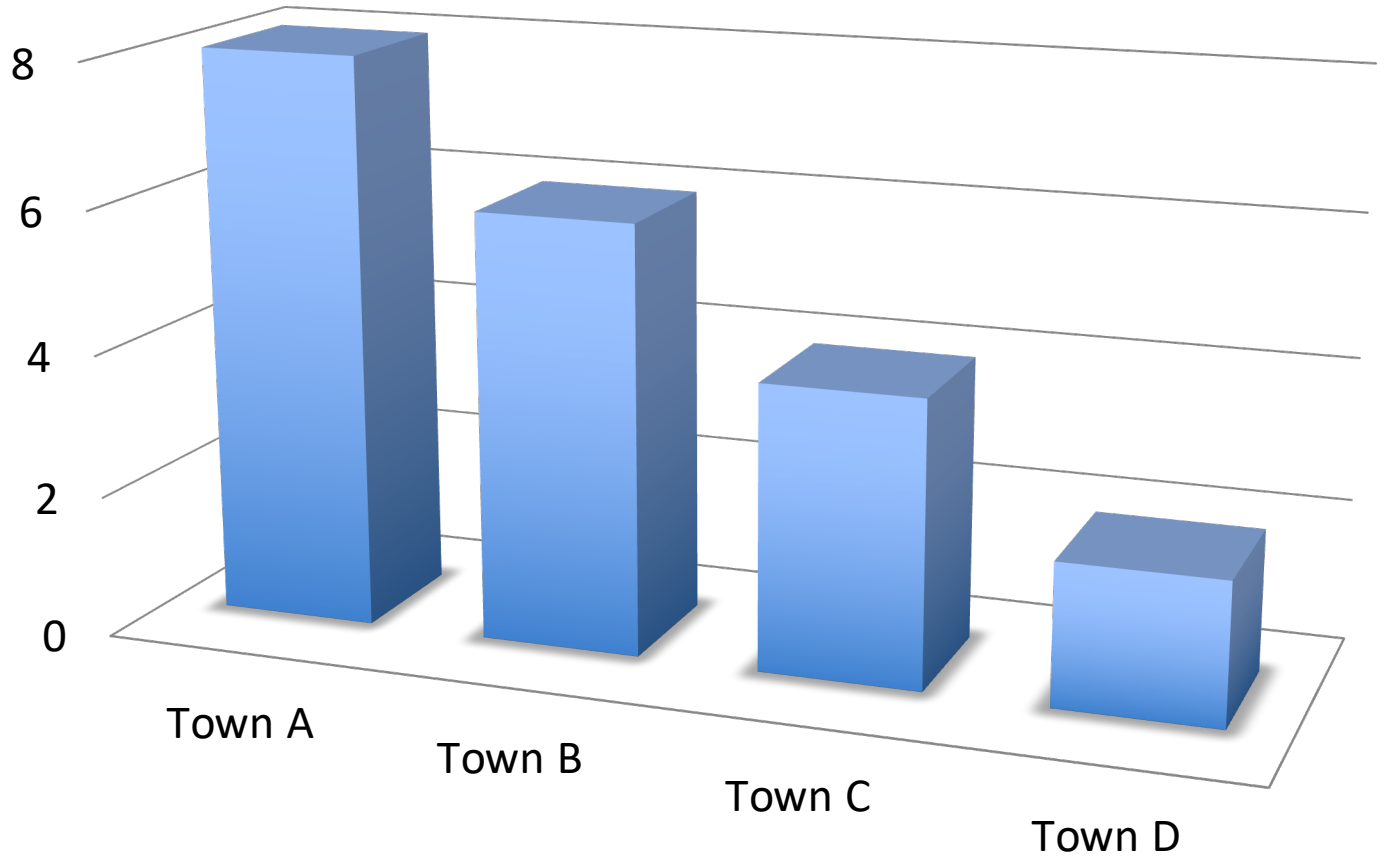


BAR CHARTS

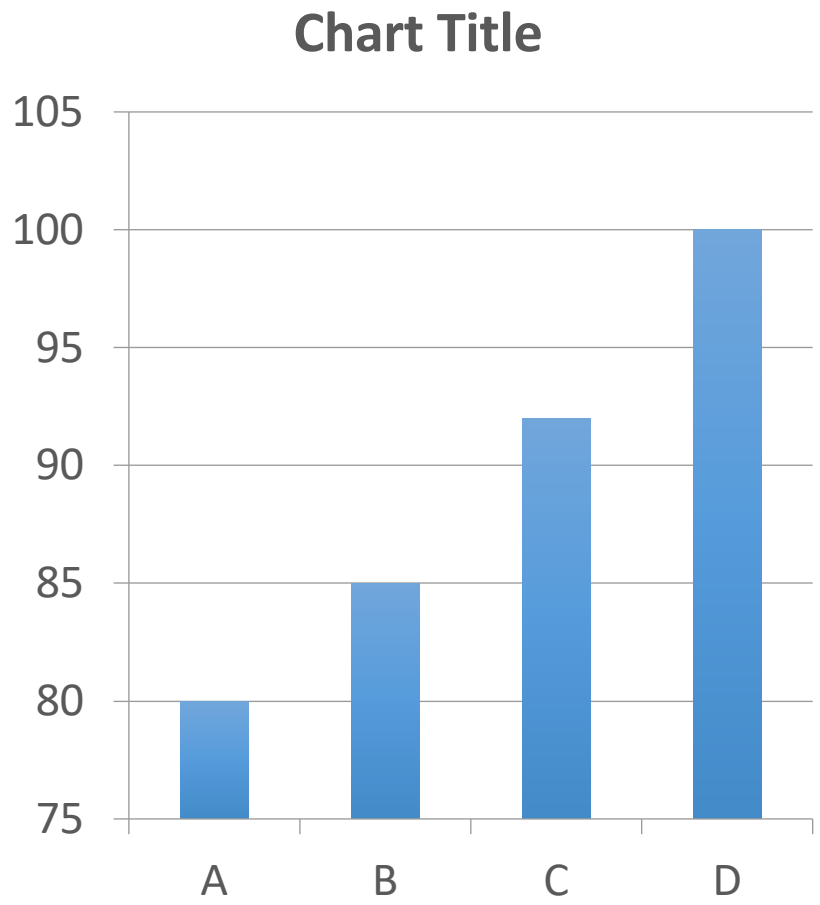

Represent discrete quantities
8
6
4
2
0
Town A
Town B
Town C
Town D

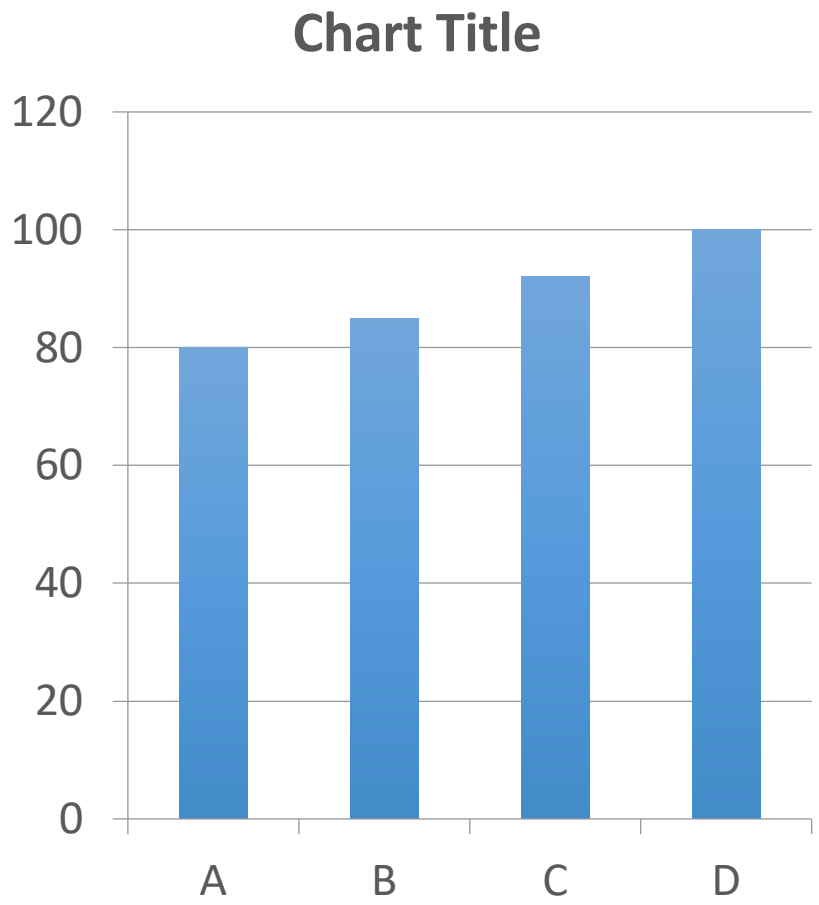
BAR CHARTS

Avoid non-functional adornation

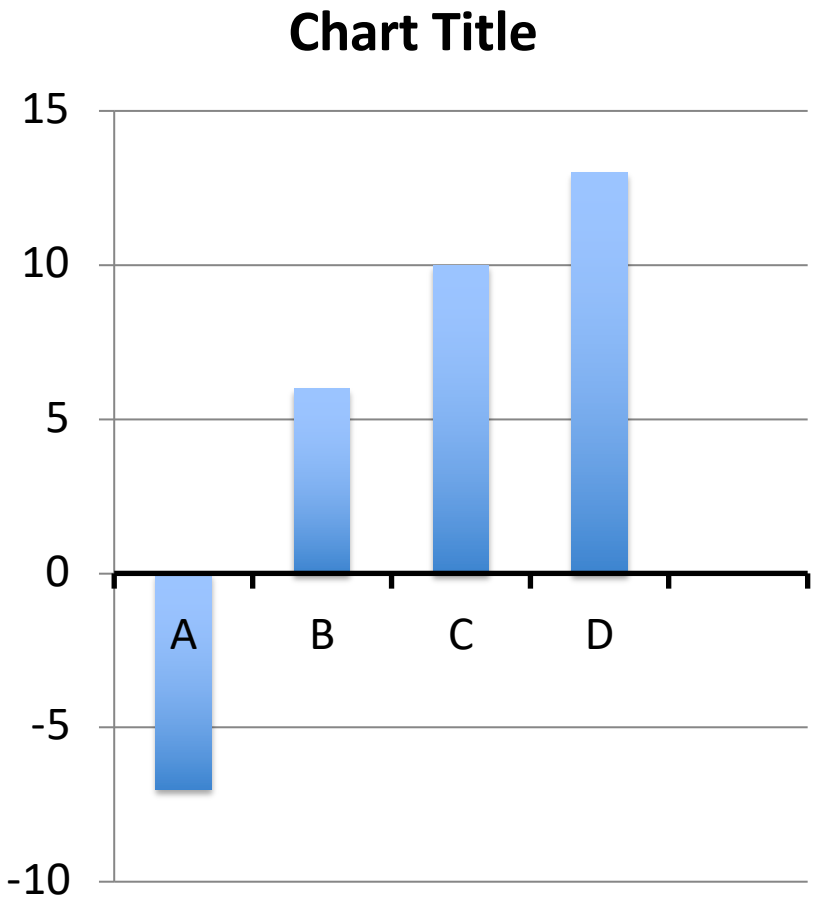


BAR CHARTS: BASELINE

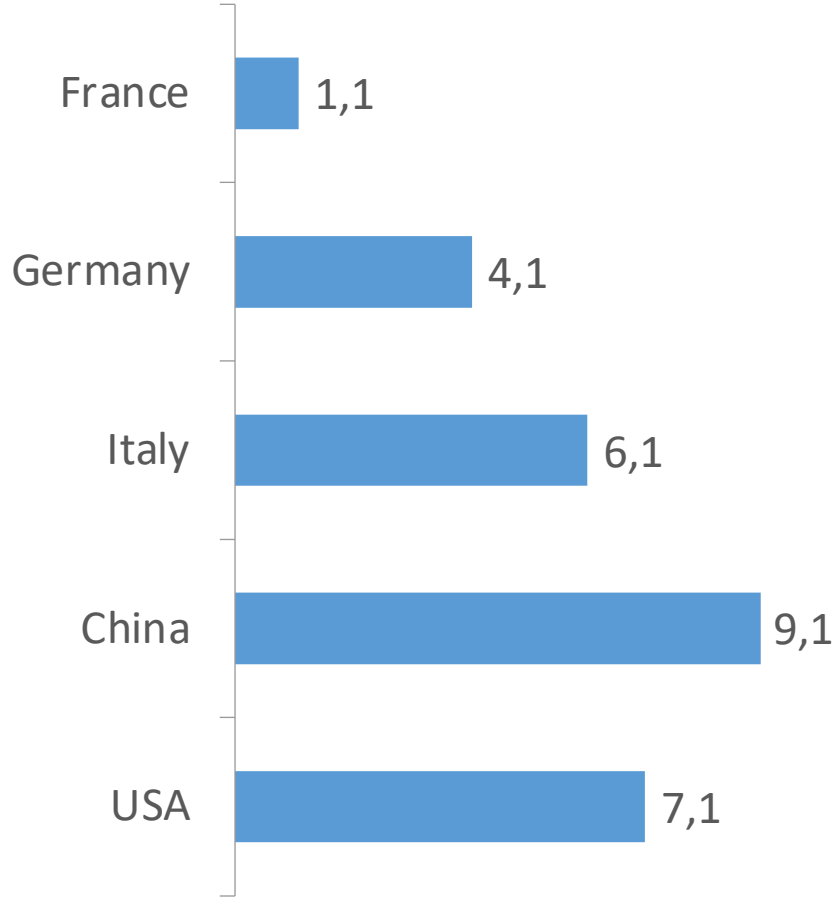


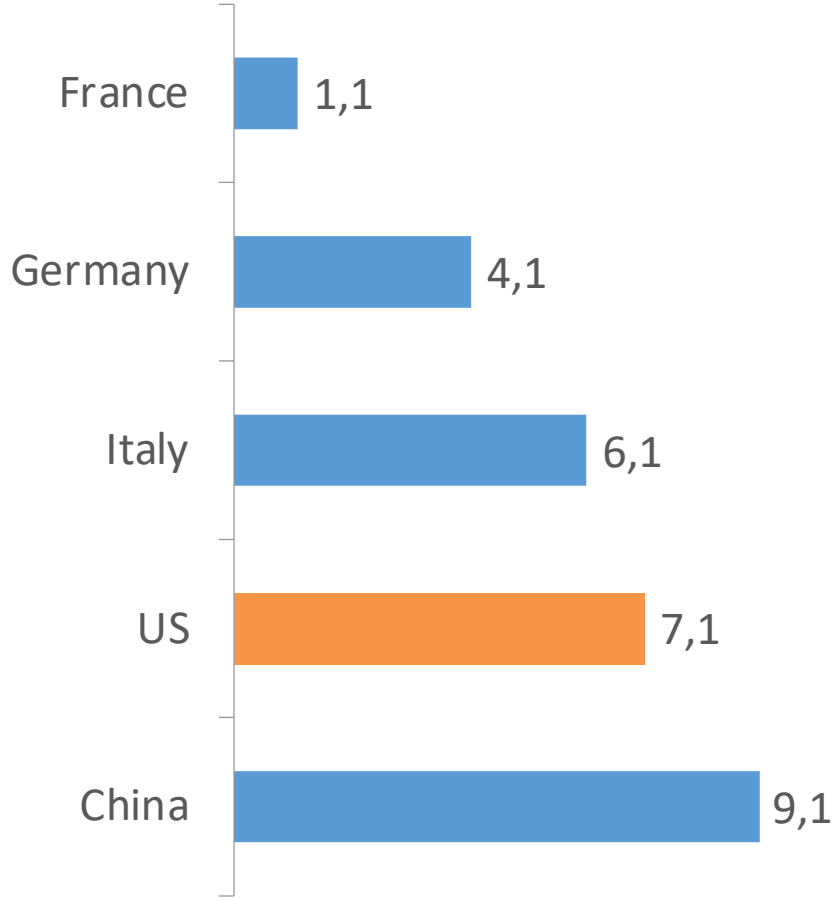


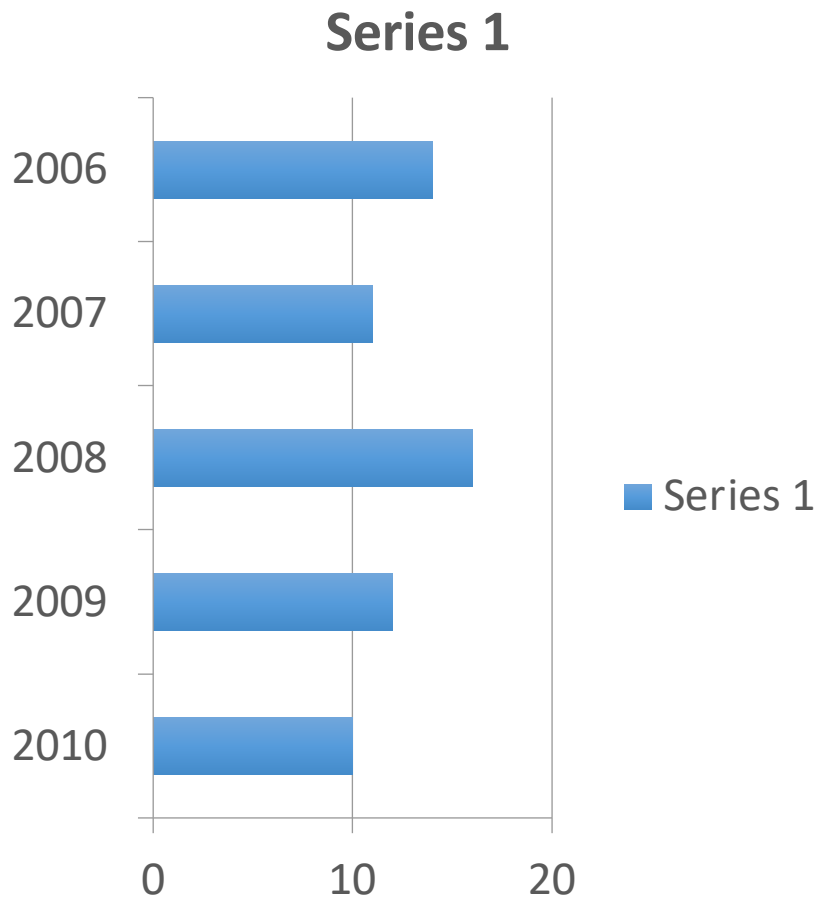
BAR CHARTS: BASELINE

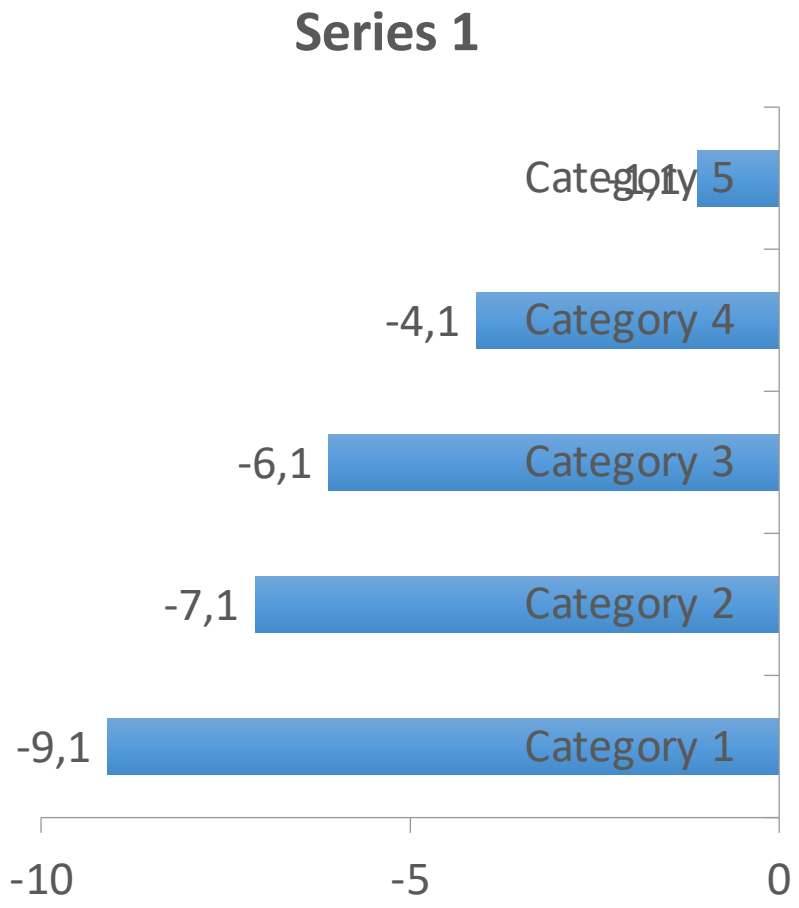


BAR CHARTS: ORDERING



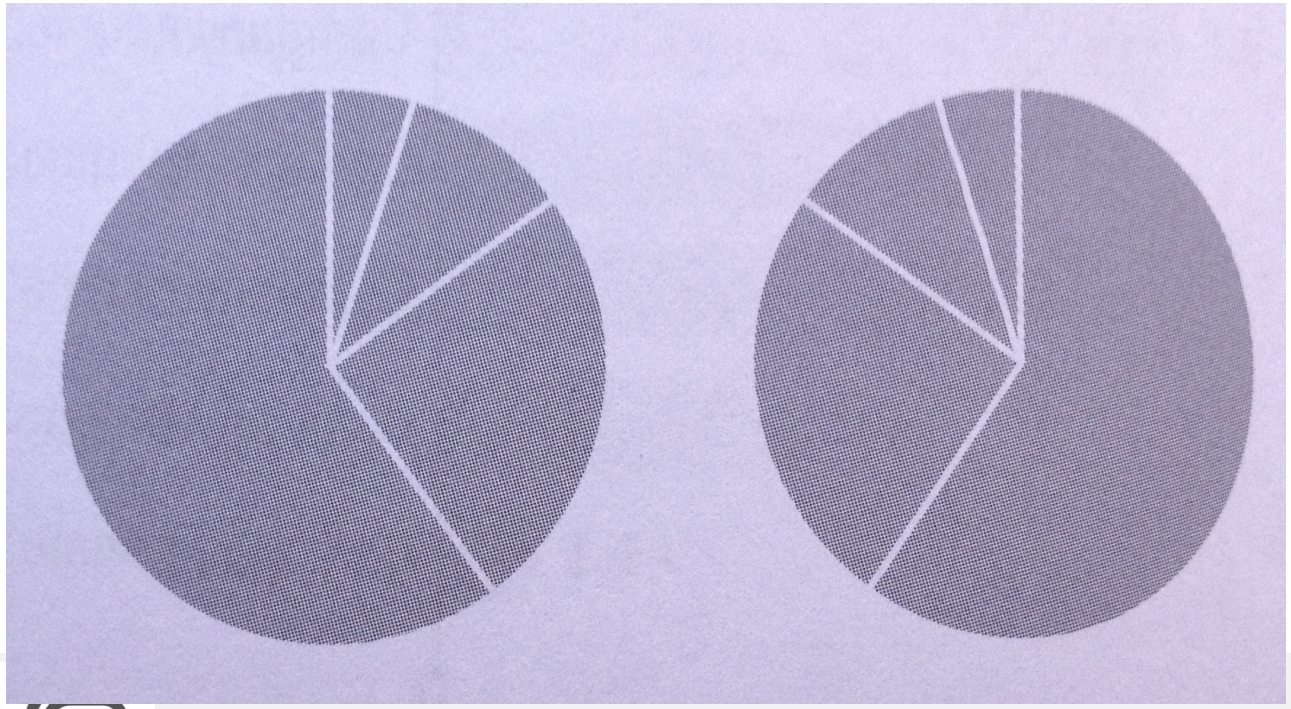



Series 1
2006
2007
2008
2009
2010
0
10
20
Series 1

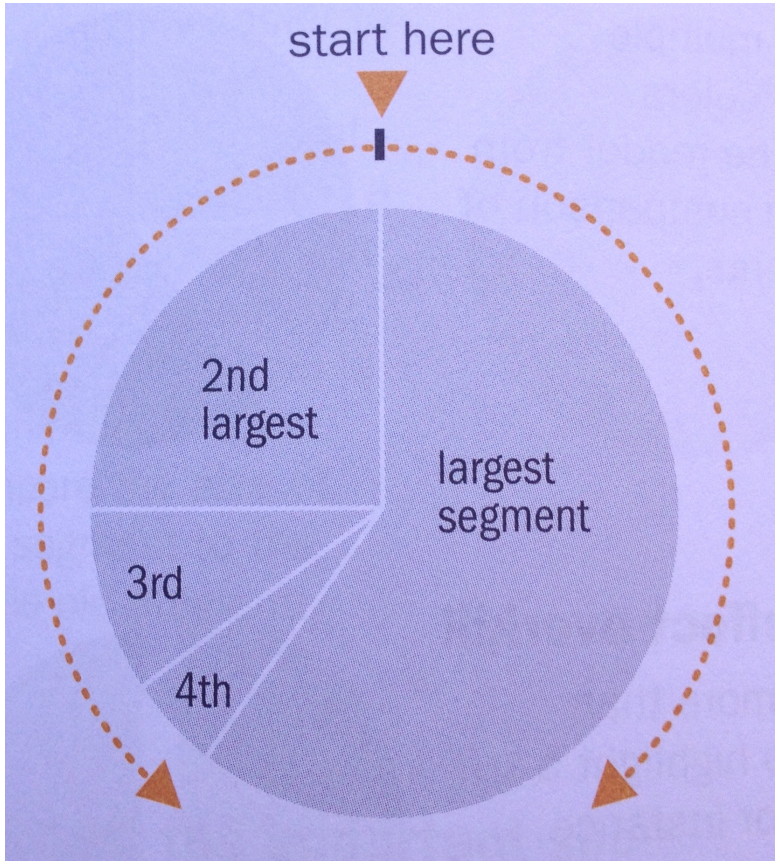

Series 1
Category 5
-4,1
Category 4
-6,1
Category 3
-7,1
Category 2
-9,1
Category 1
-10
-5
0

PIE CHARTS

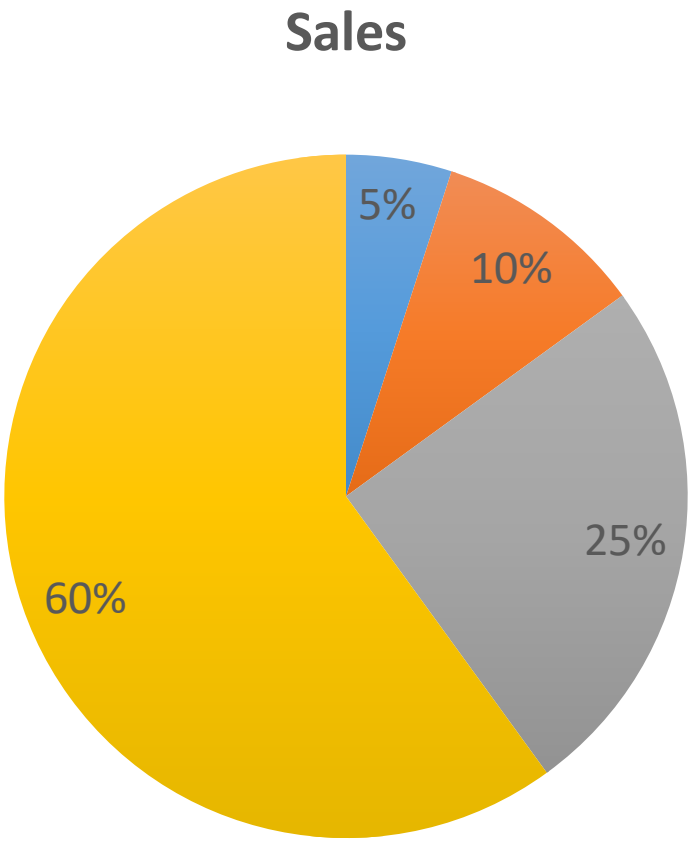
- Pie Charts compares relative sizes and contributions

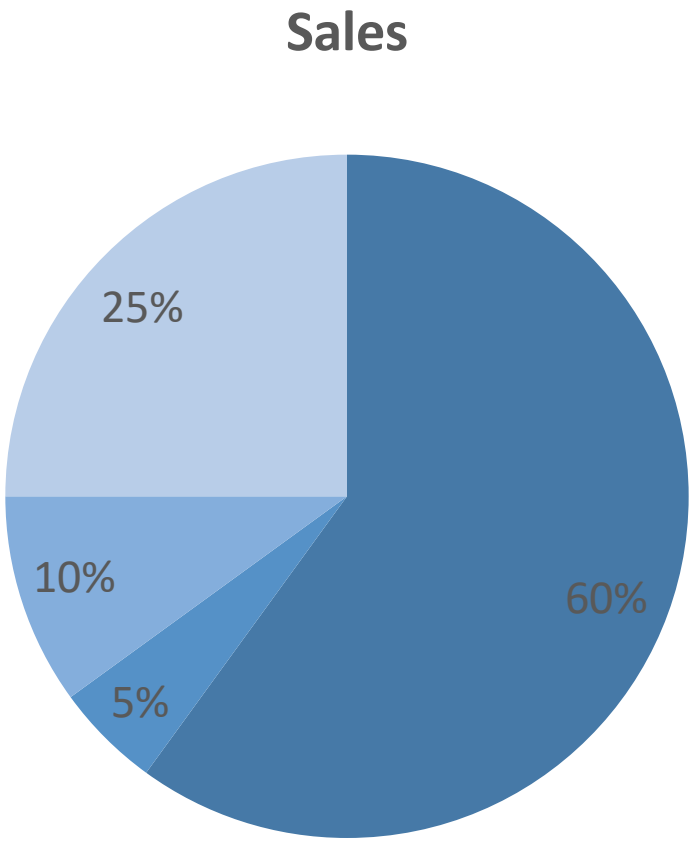


PIE CHARTS: ORDERING SLICES



CHARTING EXAMPLES





May these charts be improved? Why? How?

TAKEAWAY MESSAGES

- Charts exploit position on scale VV
- Best practice to reduce biases and misinterpretation of charts

VISUALIZATION TAXONOMY

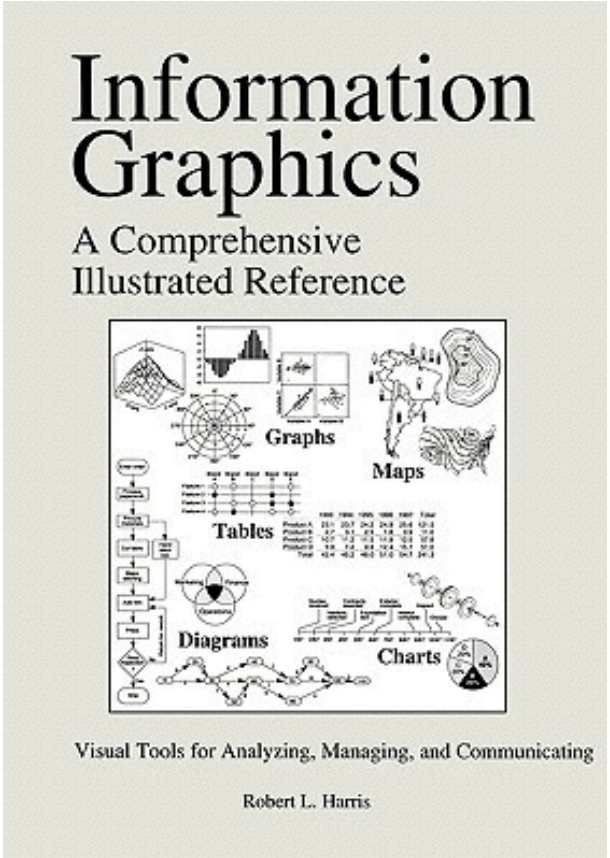
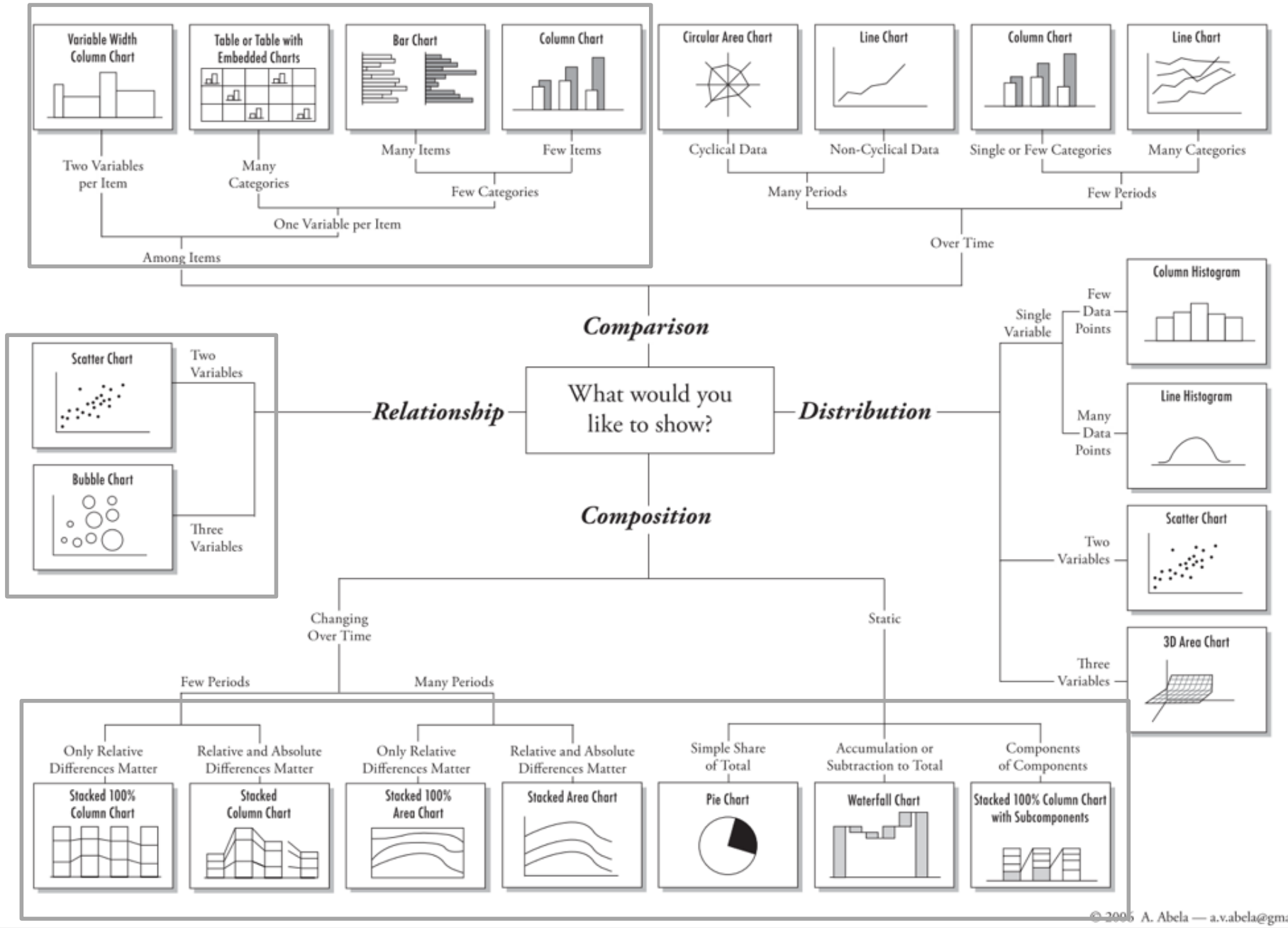
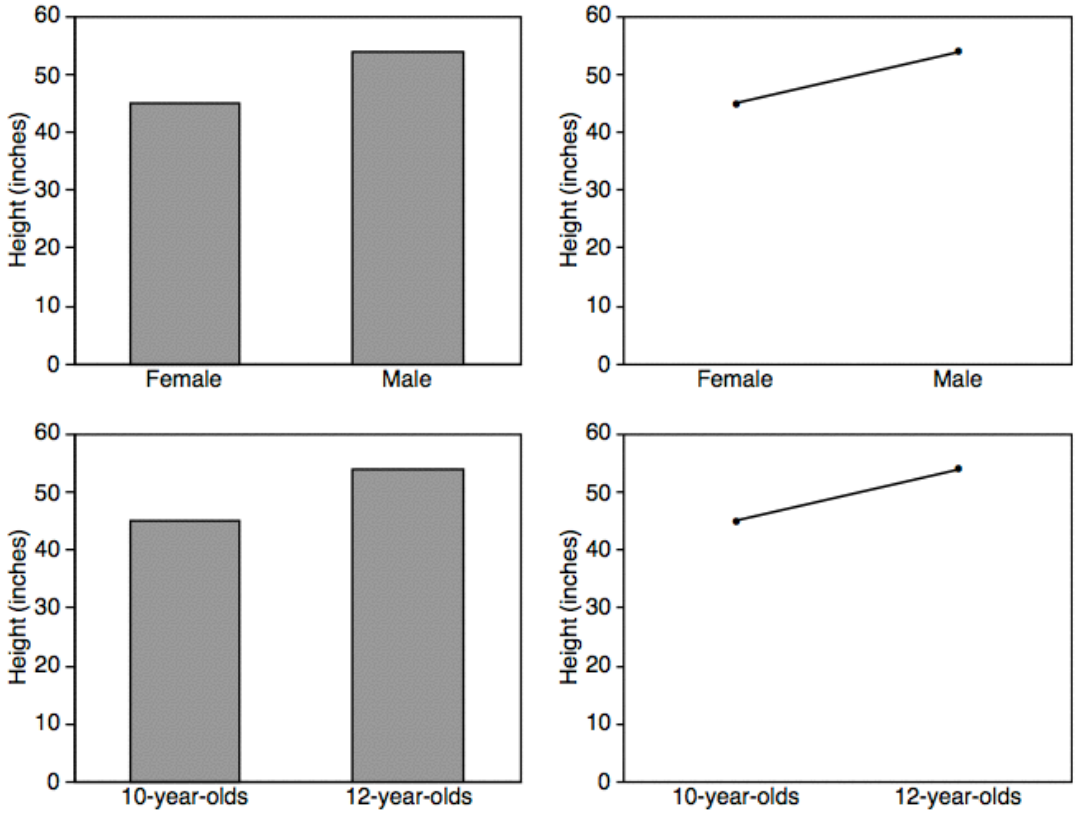


Chart Suggestions—A Thought-Starter



BARS VS. LINES

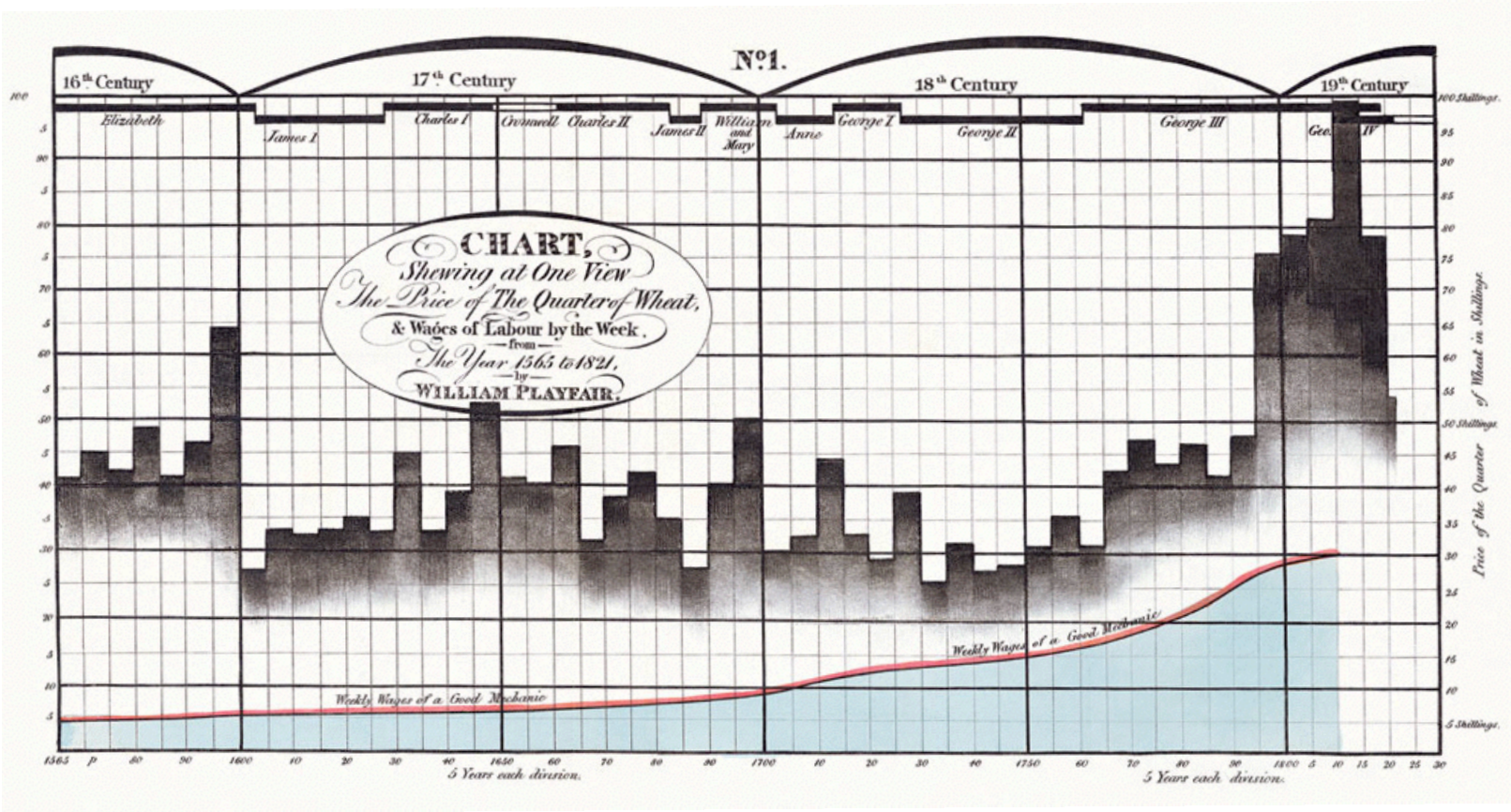


Line implies trends. Do not use for categorical data

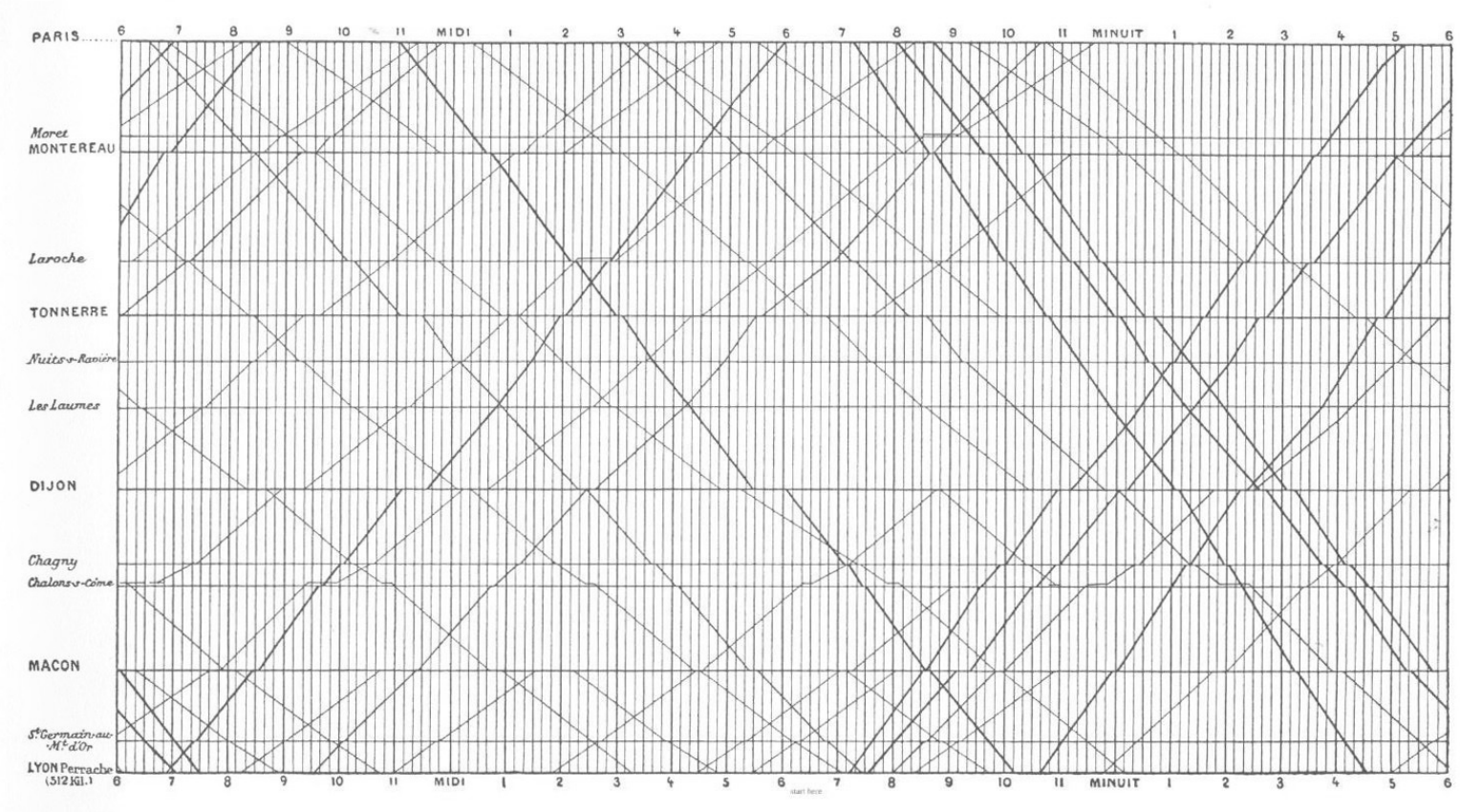
TREND OVER TIME

WILLIAM PLAYFAIR

1759-1823



PATTERNS OVER TIME



Marey's diagram, 1885

TREND OVER TIME

TREND OVER TIME

Published: February 2, 2010

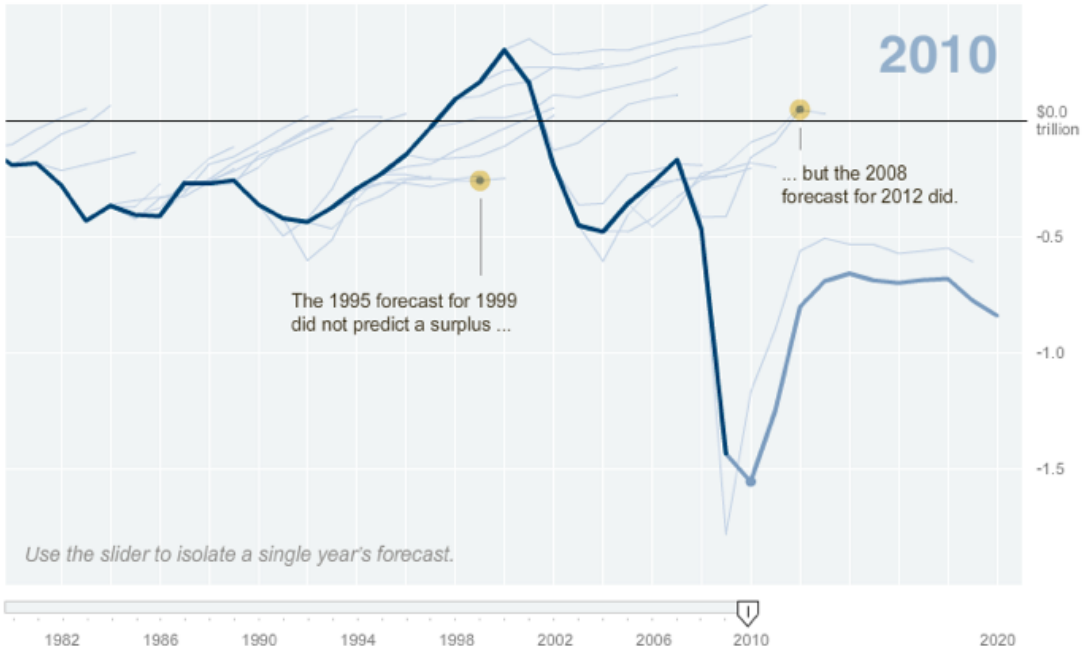
Budget Forecasts, Compared With Reality

Just two years ago, surpluses were predicted by 2012. How accurate have past White House budget forecasts been?

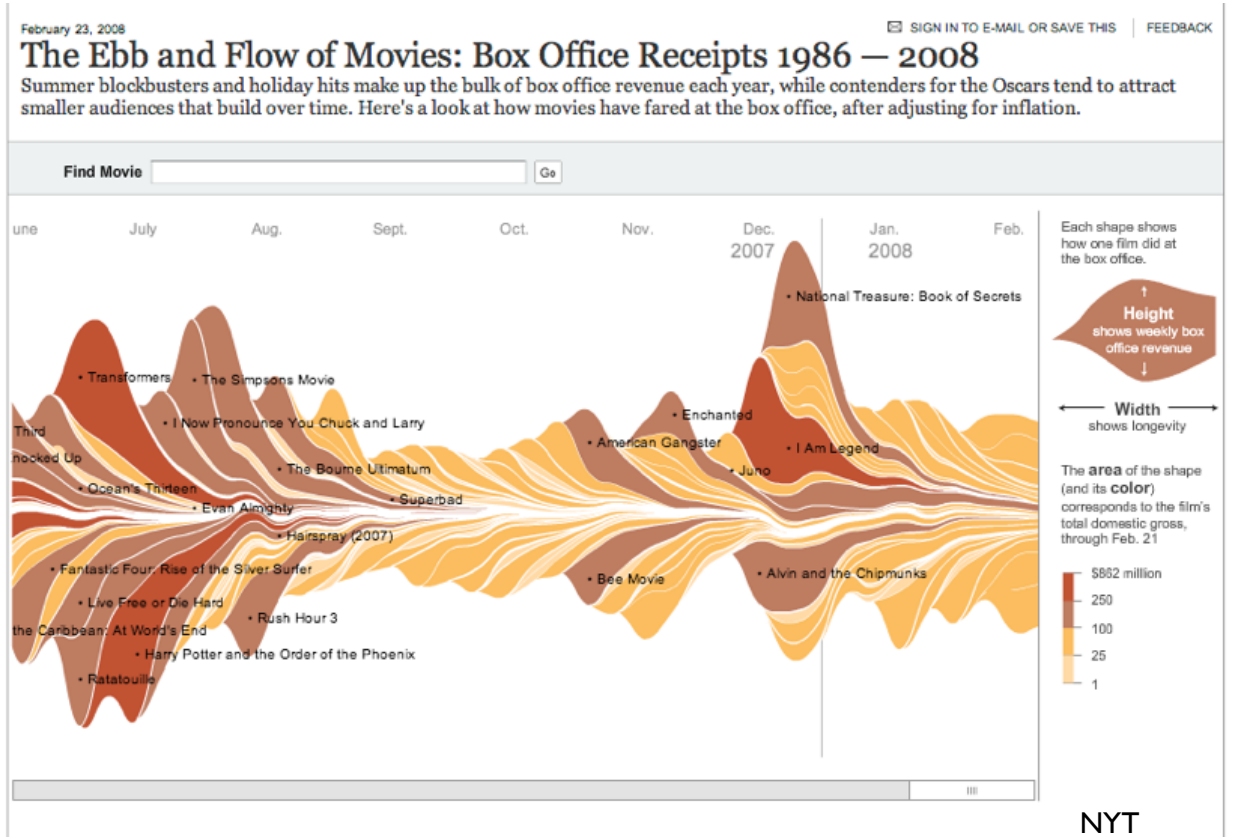
1 2 3 4 5 6 NEXT ▸

Latest forecast

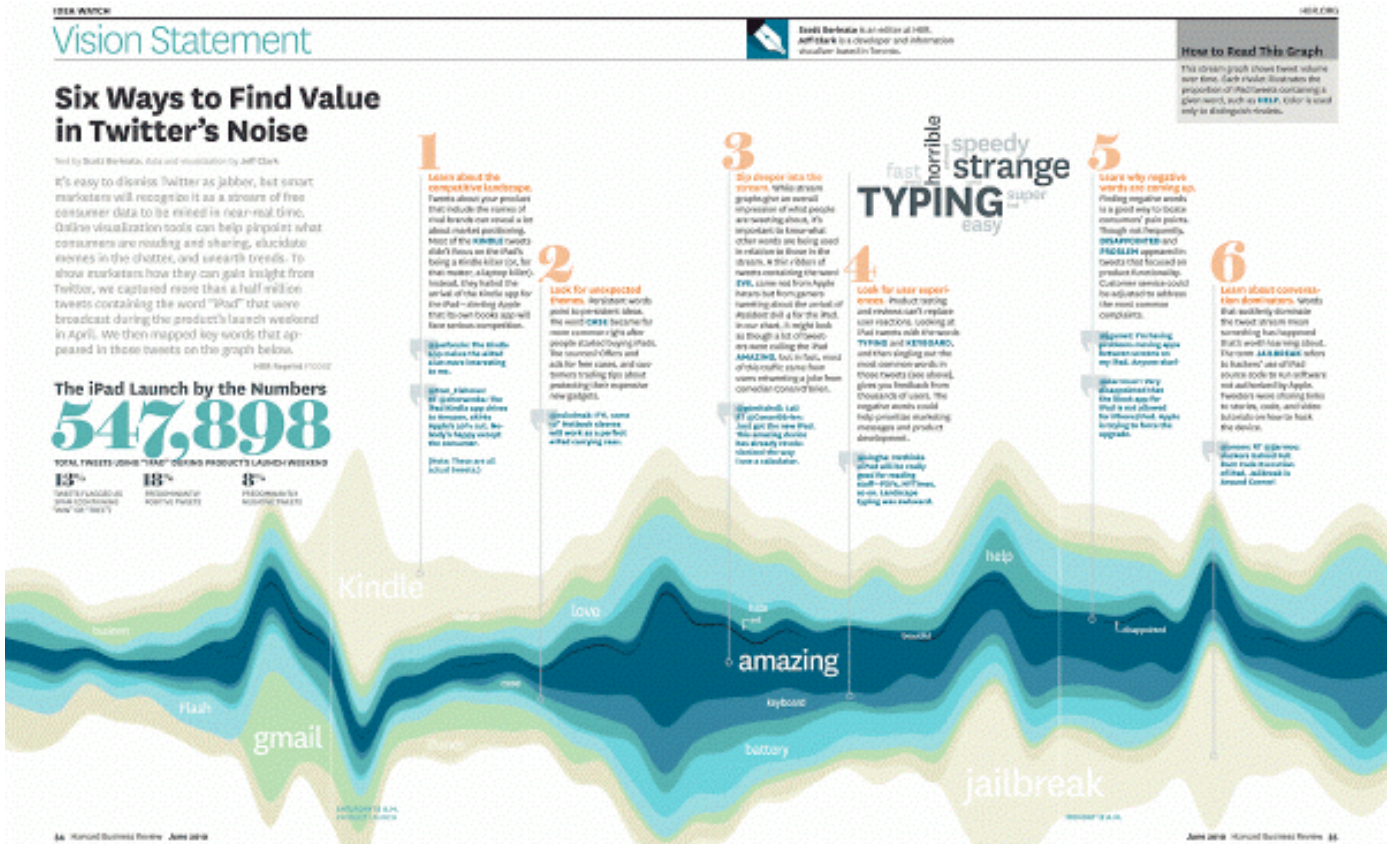
Today, with a better understanding of the severity of the economic downturn, the deficit situation is much more dire.



STREAMGRAPHS

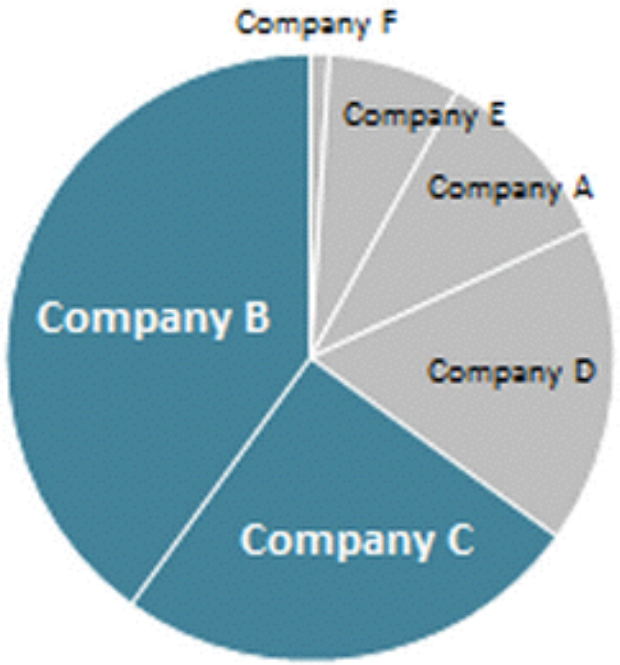


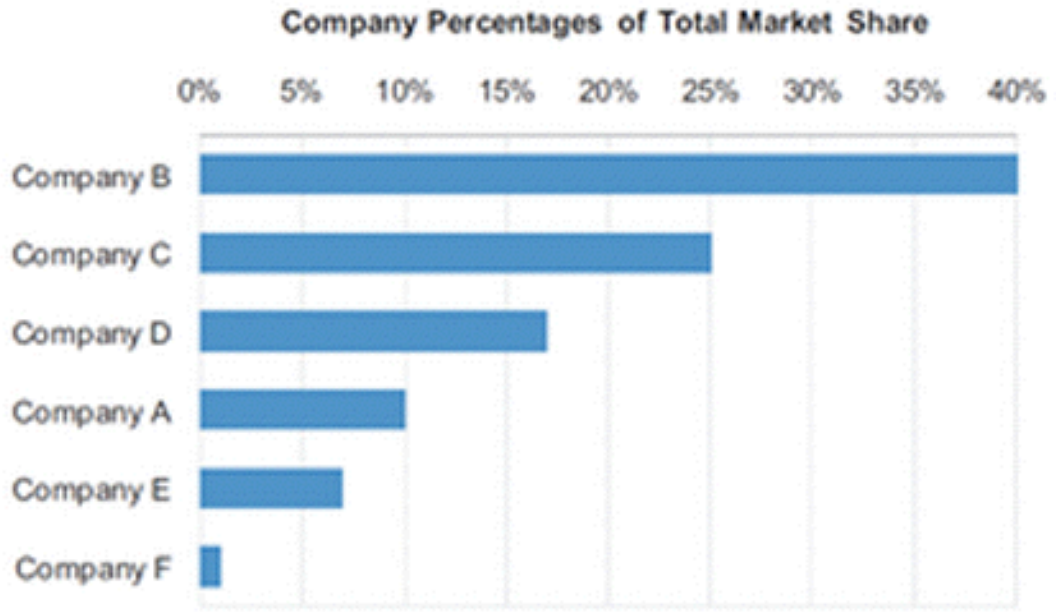
NYT


Vision Statement
Six Ways to Find Value in Twitter's Noise
The iPad Launch by the Numbers
547,898
How to Read This Graph
1
2
3
4
5
6
horrible
speedy
fast
strange
TYPING
super
easy
Kindle
Flash
gmail
love
amazing
keyboard
battery
help
jailbreak

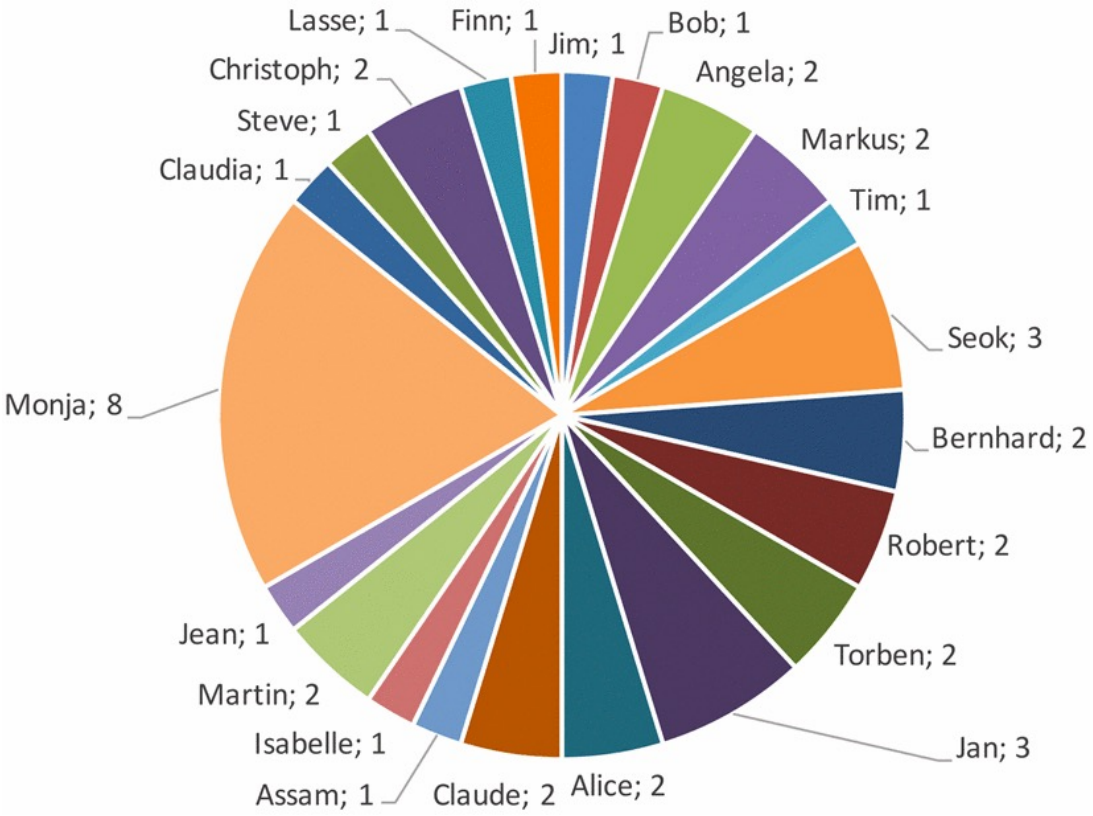
PIE VS BAR CHARTS

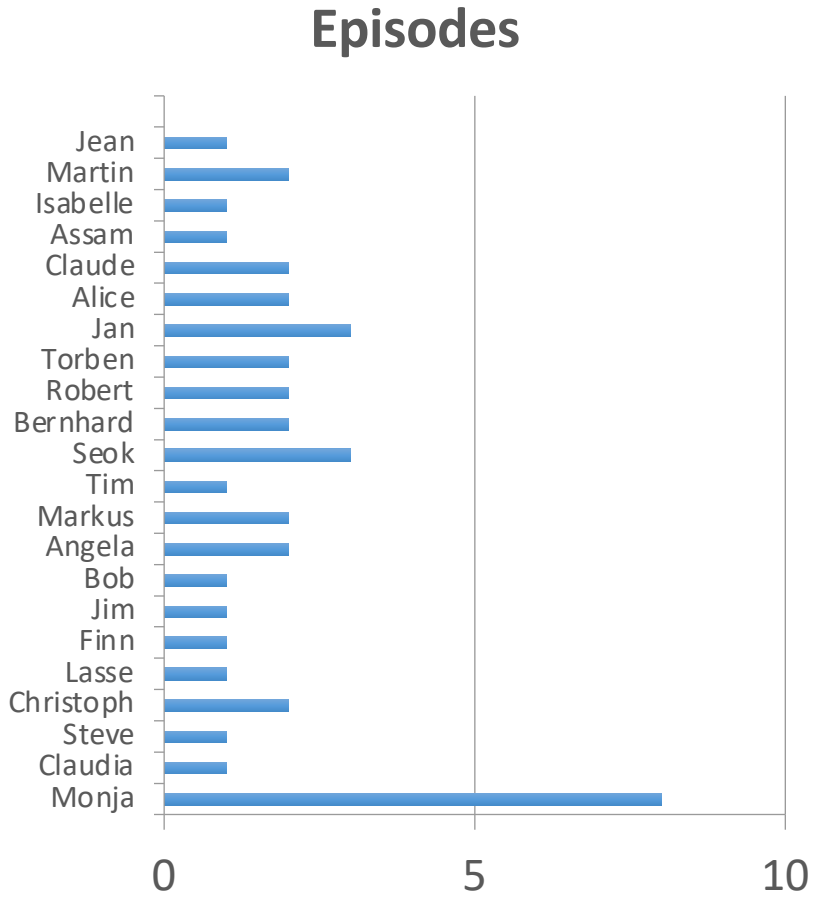
65% of the market is controlled by companies B and C





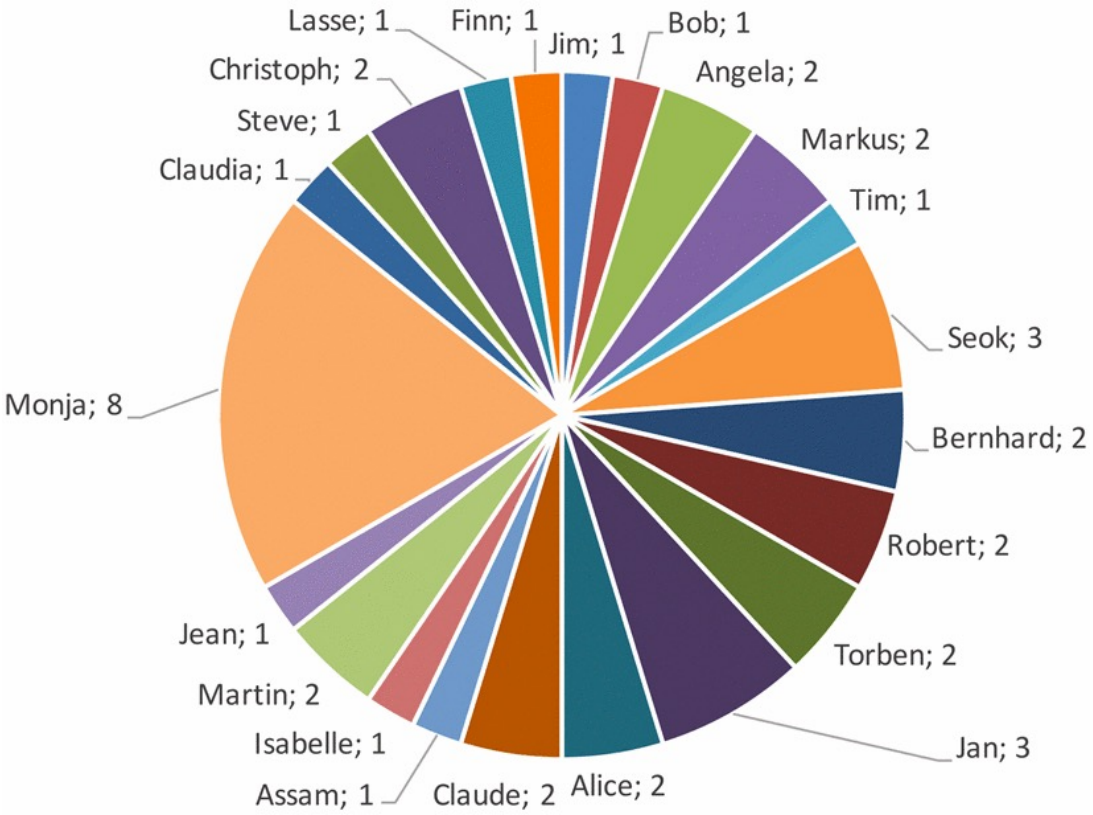
PIES VS BAR CHARTS

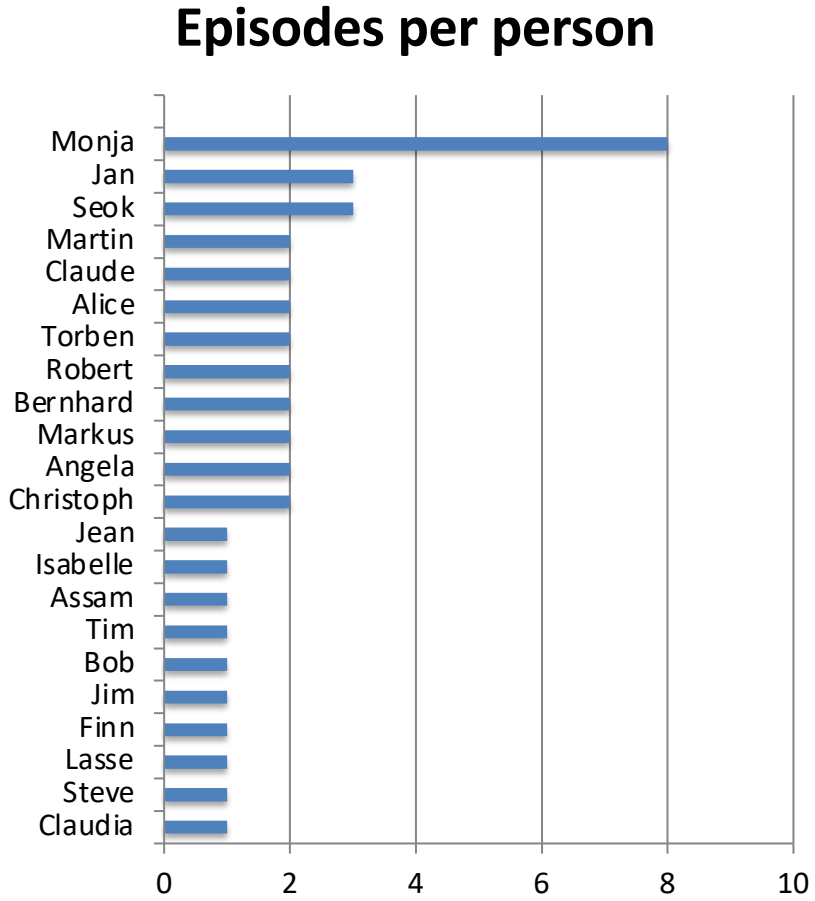




Furthermore, we present the distribution of attacks towards employees in detail in Fig. 10 right. The blue employees are secretaries, the green ones are administrators and the red ones are scientific employees. The number following the name is the number of times that person was attacked. All of the names are pseudonyms for real people. The person that suffered the most attacks is Monja a secretary with overall 8 attacks. In contrast, all other victims suffered between 1 and 3 attacks.

PIES VS BAR CHARTS (IMPROVED)





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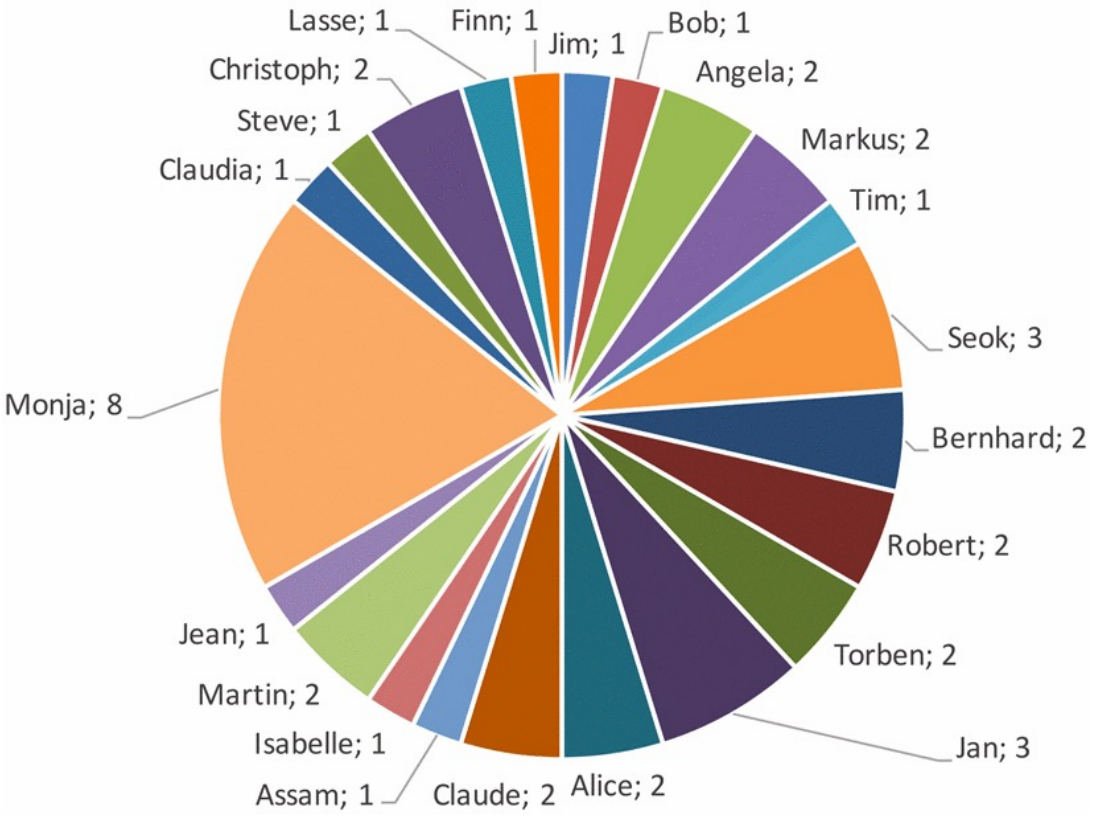
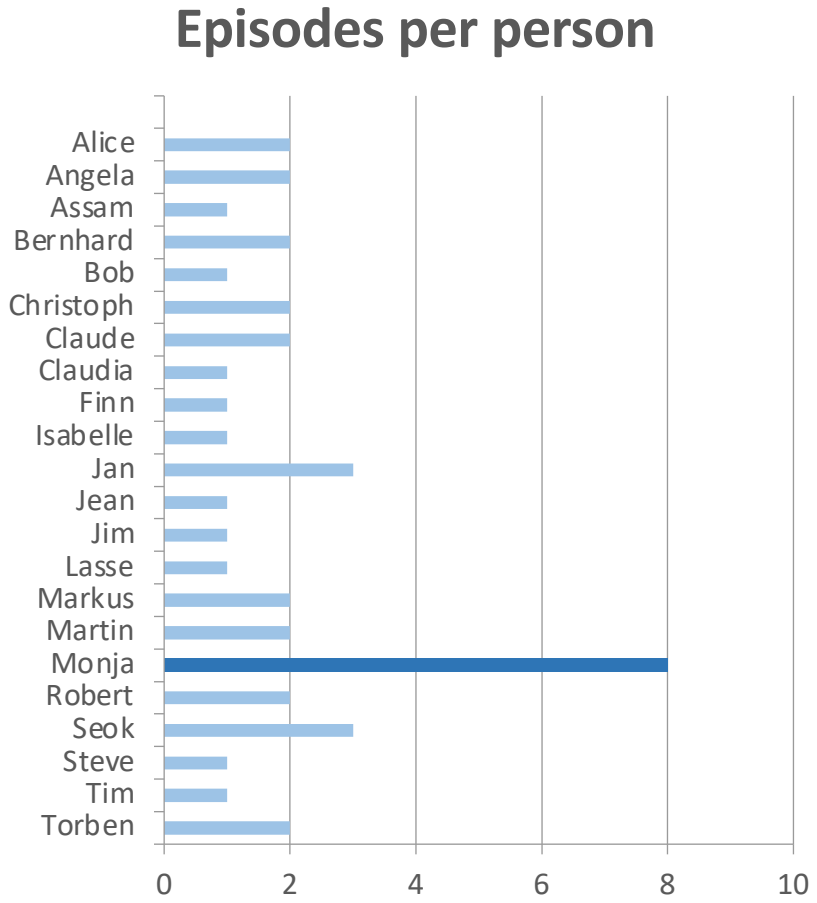
PIES VS BAR CHARTS (IMPROVED)





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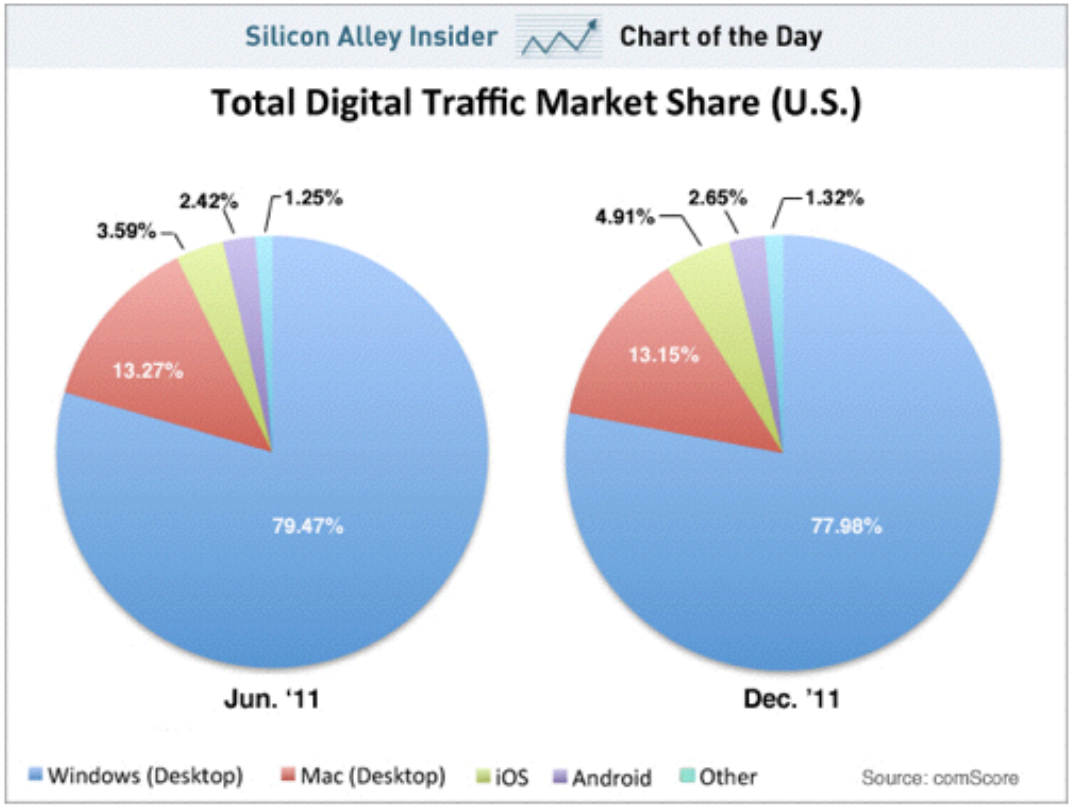
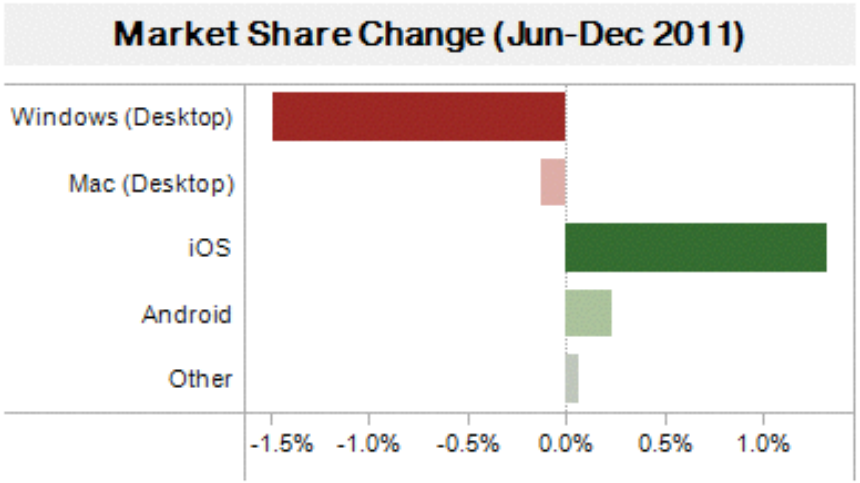
SHOWING CHANGES

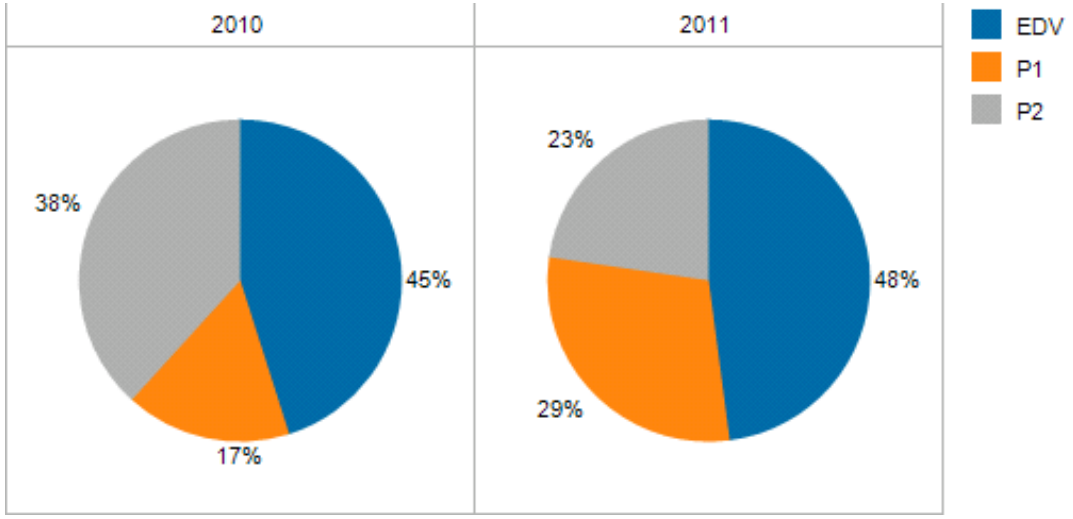


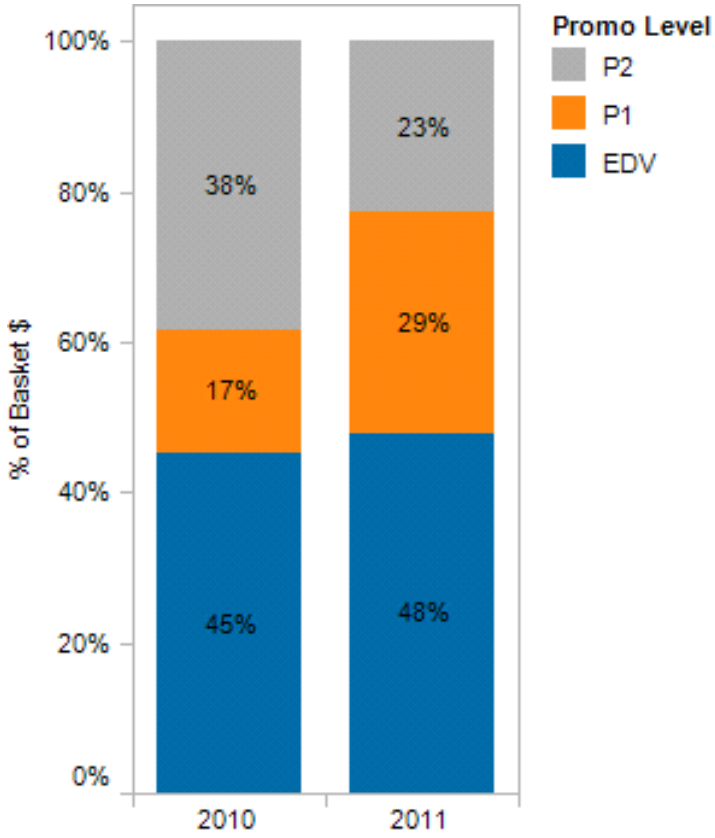


Market Share

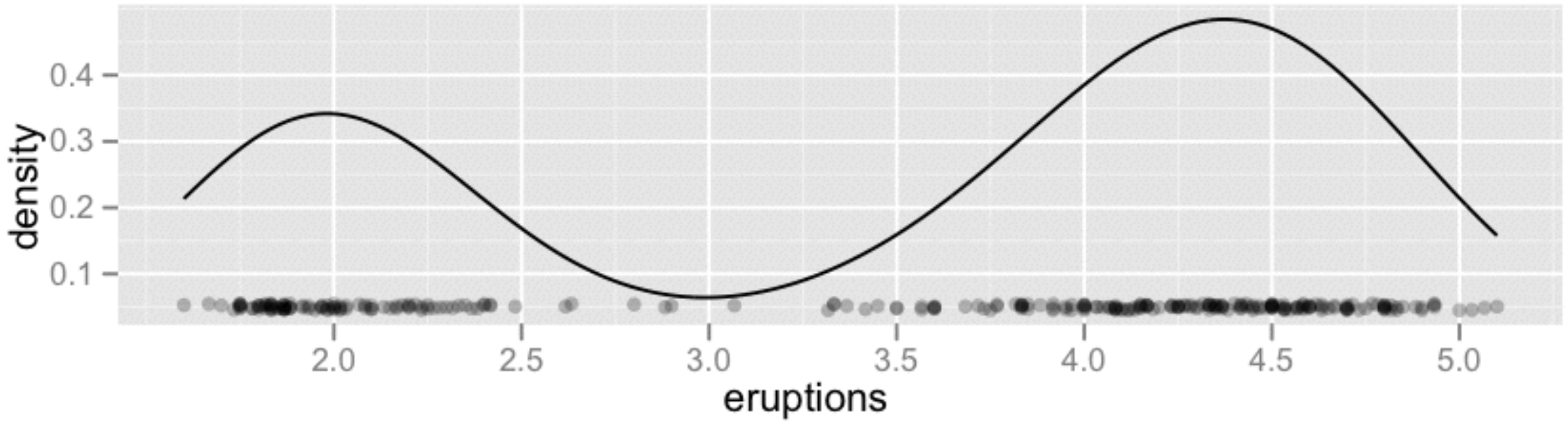
Platform	Jun 2011	Dec 2011	Change
Windows (Desktop)	79.5%	78.0%	(1.5%)
Mac (Desktop)	13.3%	13.2%	(0.1%)
iOS	3.6%	4.9%	1.3%
Android	2.4%	2.7%	0.2%
Other	1.3%	1.3%	0.1%

SHOWING CHANGES

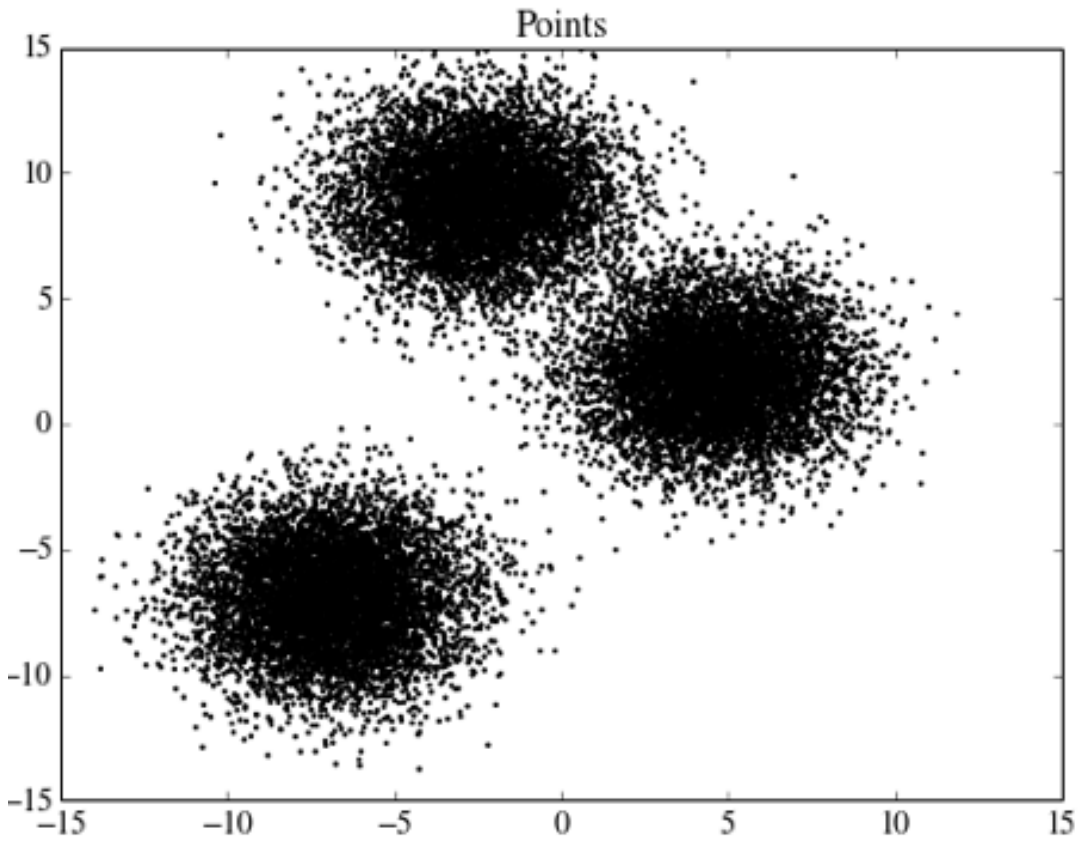


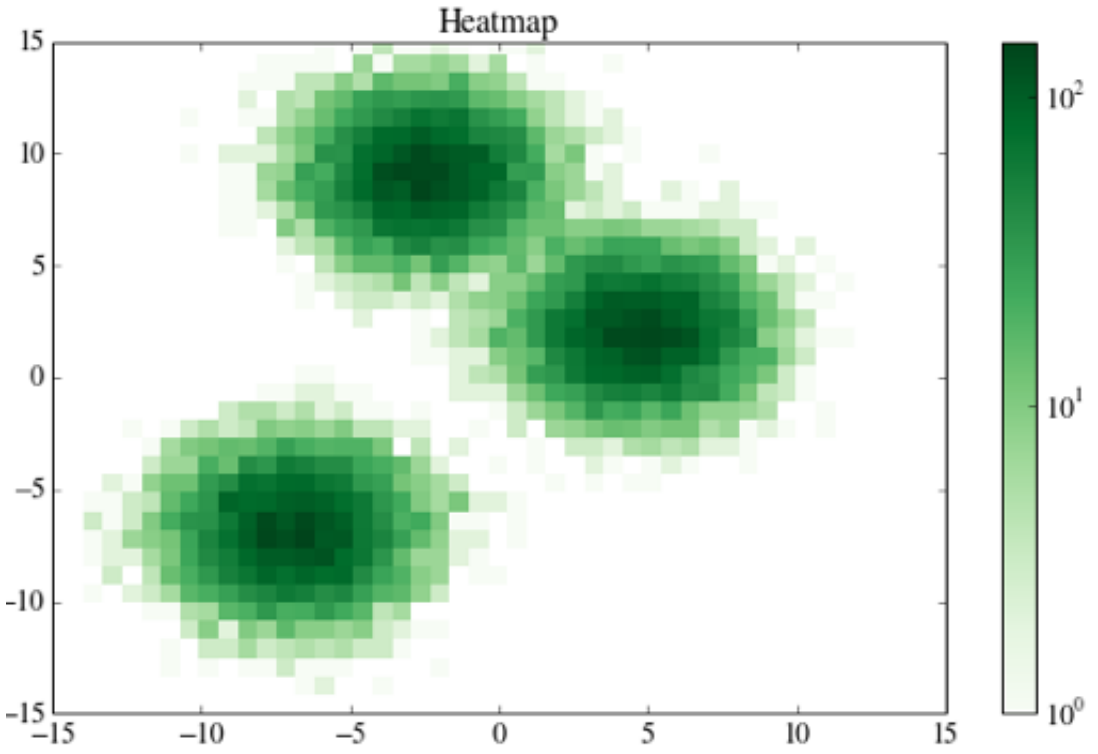


DENSITY PLOT

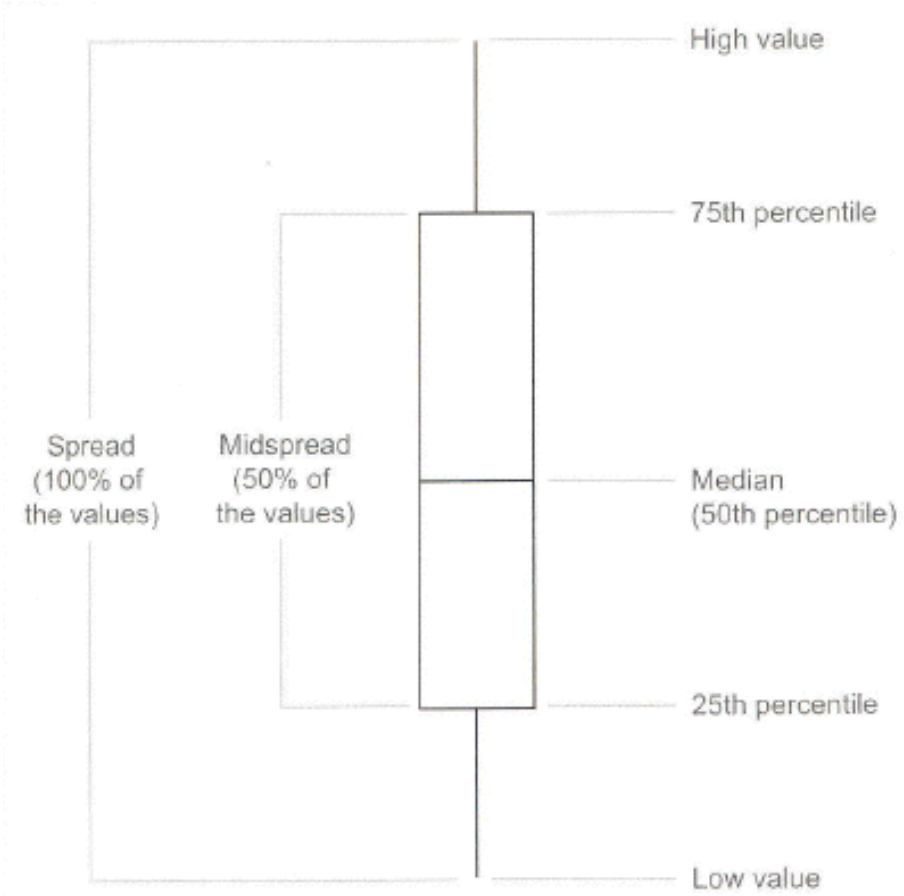


2D DENSITY PLOTS

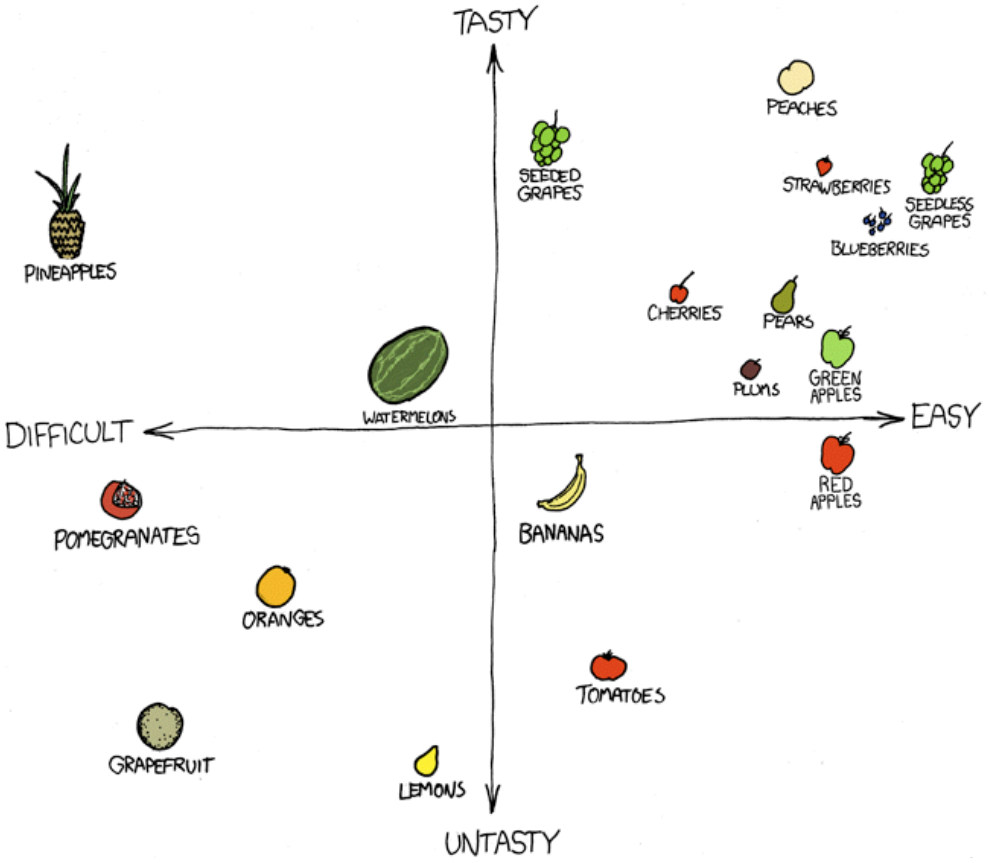




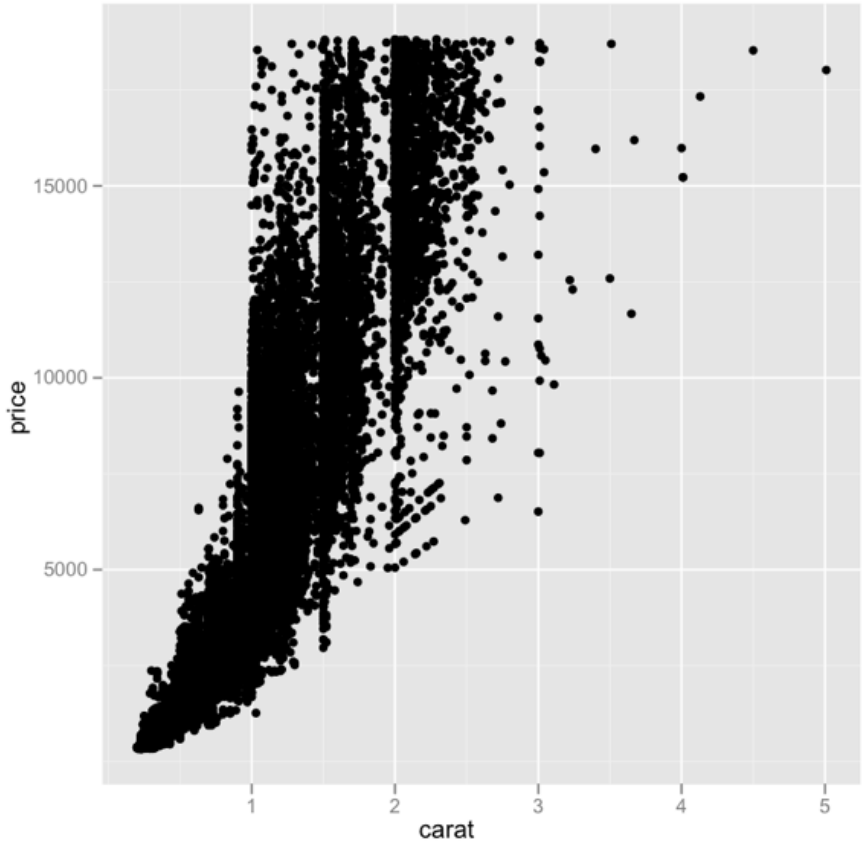
BOX PLOTS


High value
75th percentile
Spread
(100% of
the values)
Midspread
(50% of
the values)
Median
(50th percentile)
25th percentile
Low value

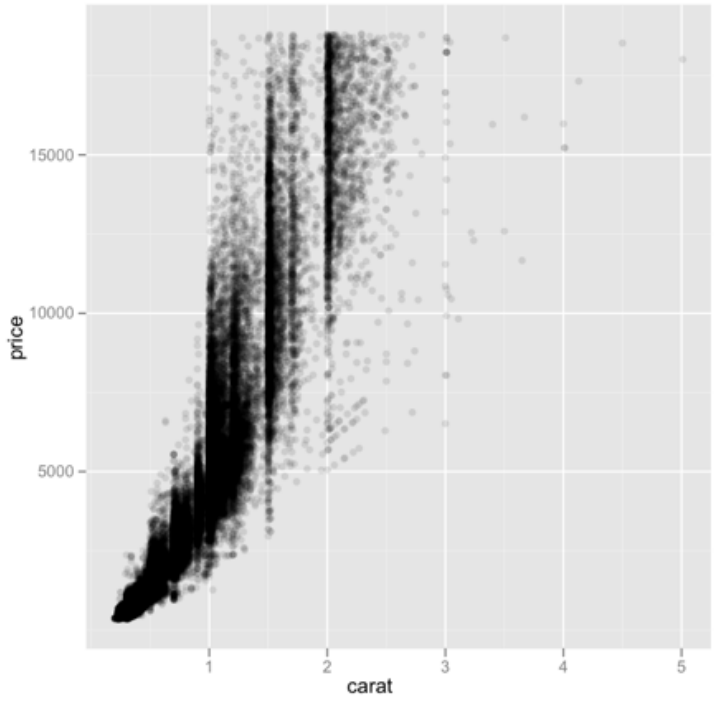
SCATTERPLOT



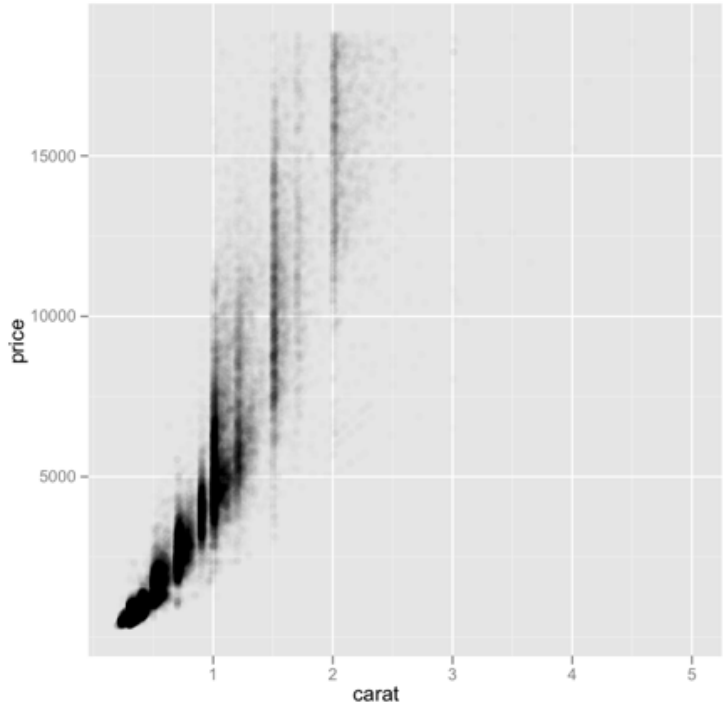
CLUTTERING, OVERPLOTTING



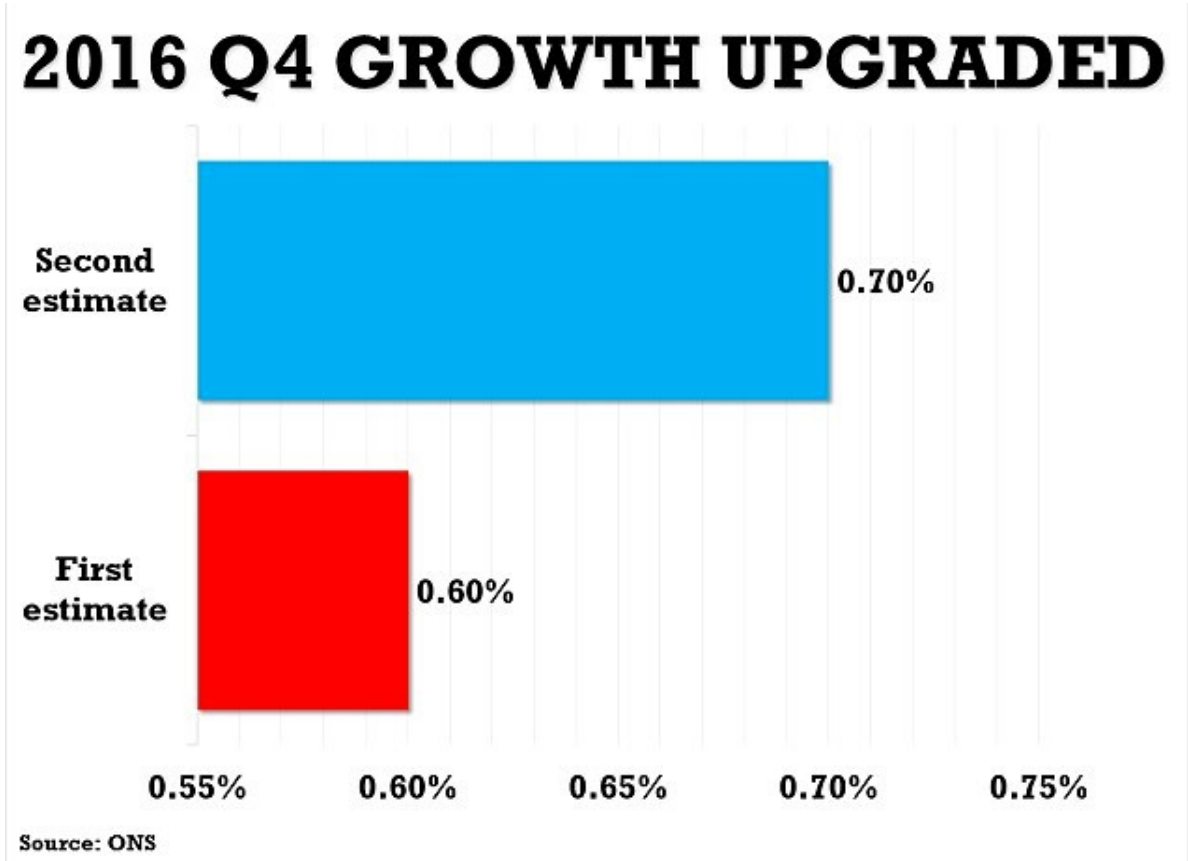
alpha=1/10



alpha=1/100

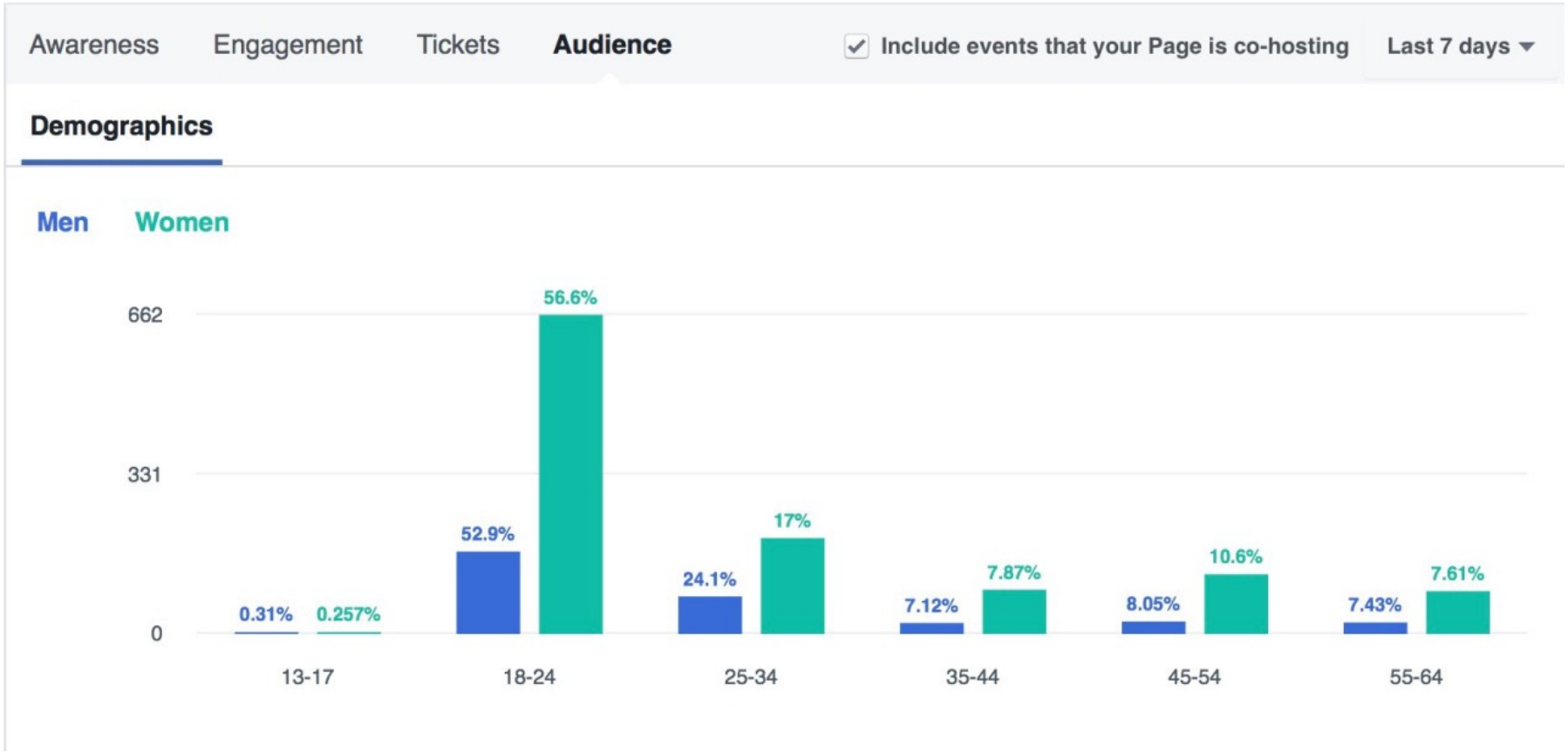


A FEW EXAMPLES AND CASE STUDIES

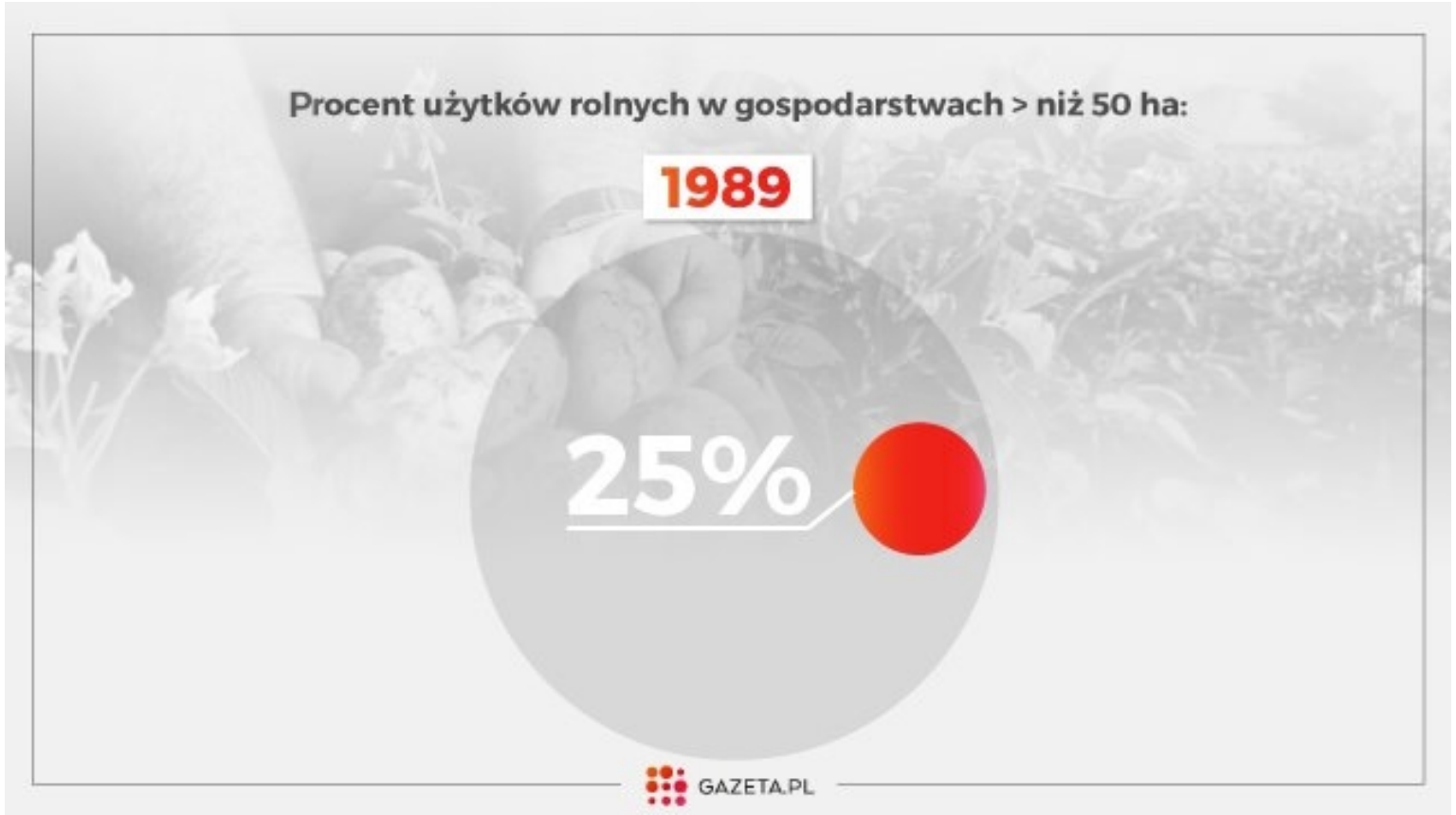


The Office for National Statistics (ONS) said gross domestic product (GDP) expanded by 0.7 per cent in the fourth quarter - an increase from the 0.6 per cent calculated on the watchdog's first look at the economy

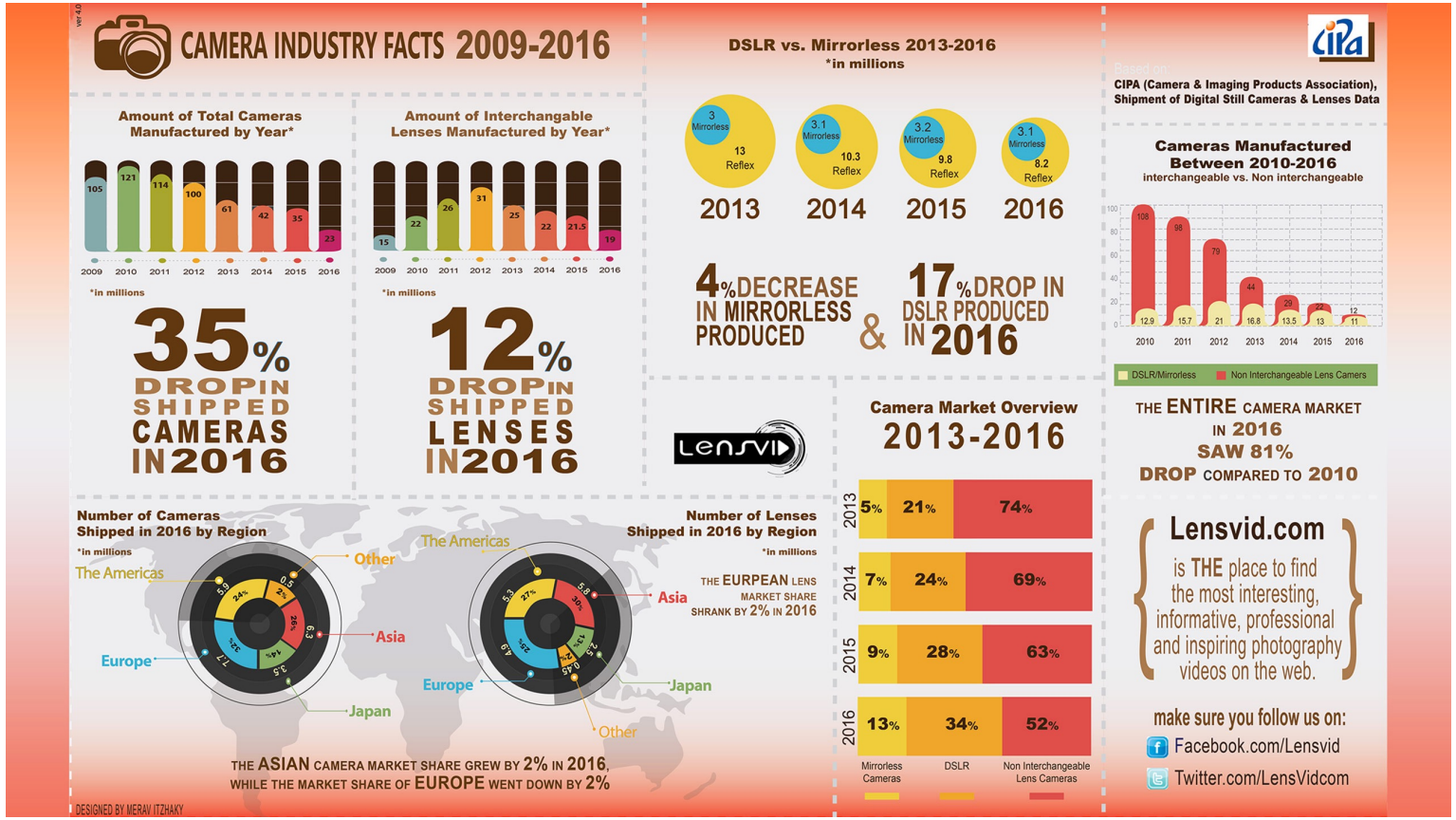
Source: http://www.dailymail.co.uk/news/article-4248690/Economy-grew-0-7-final-three-months-2016.html



Source: Facebook Analytics

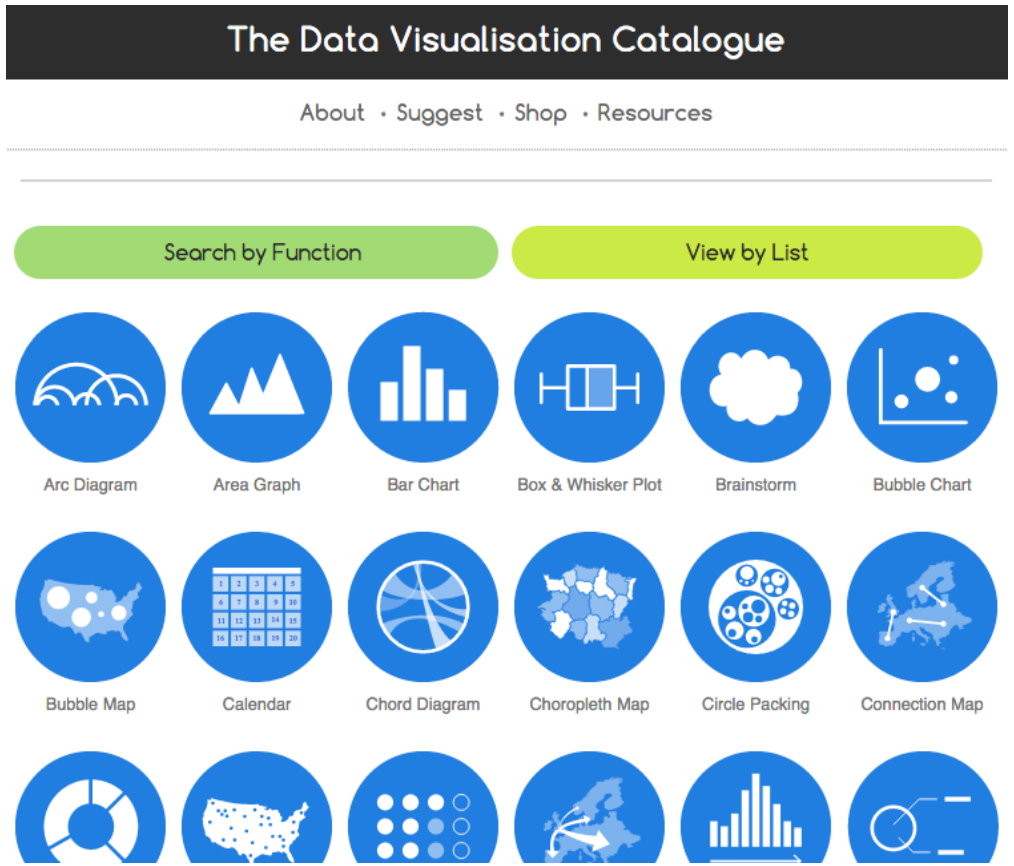


Source: http://weekend.gazeta.pl/weekend/1,152121,20528386,wierza-mocniej-niz-miastowi-za-to-zarabiaja-mniej-i-calym.html



Source: https://lensvid.com/gear/lensvid-exclusive-happened-photography-industry-2016/

VISUAL TAXONOMY



TAKEAWAY MESSAGES

- Appropriate chart type for specific data type and visualization task