

Data Visualisation: Good Things to Know

Suzanne Little
School of Computing
Dublin City University

Insight 

SFI RESEARCH CENTRE FOR DATA ANALYTICS

HOST INSTITUTIONS



NUI Galway
OÉ Gaillimh



University College Cork, Ireland
Cártaíste na hOileáine Céaraigh



PARTNER INSTITUTIONS



Maynooth University
National University of Ireland Maynooth



Trinity College Dublin
Coláiste na Tríonóide, Páirc Átha Cliath
The University of Dublin



FUNDED BY:



European Union
European Regional
Development Fund

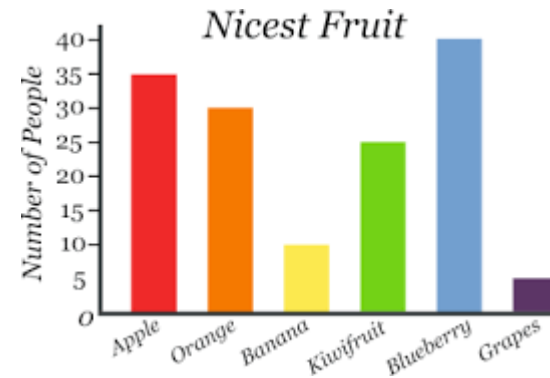
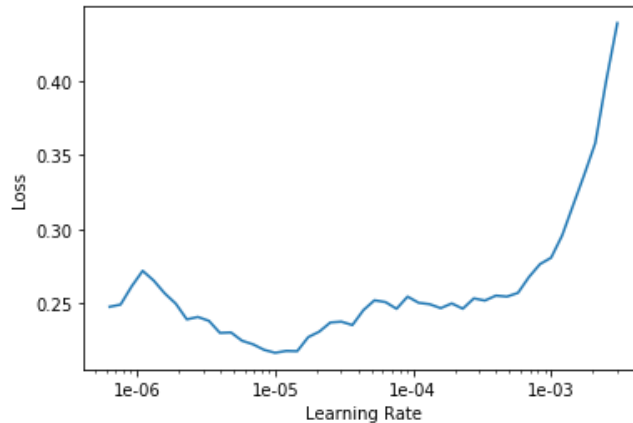
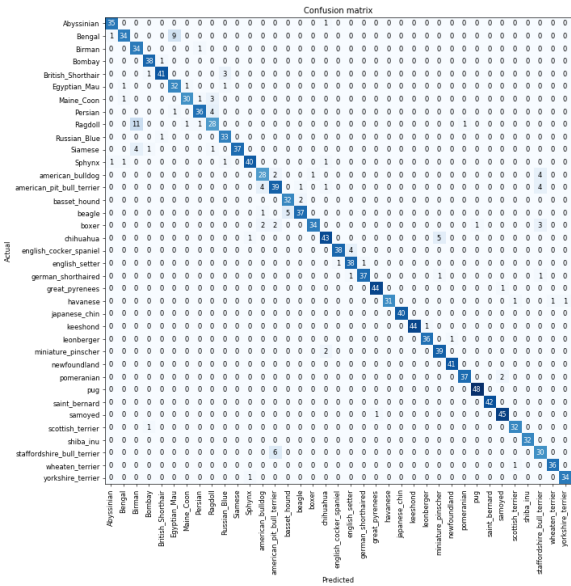


Outline

- Why visualise data?
- Good things to know
 - Pie charts
 - 3D
 - Area
 - Axes
 - Clutter
- Good Visualisation?

Why visualise data?

- To explore and analyse
- To communicate



Gathering

- Capture
- Import
- Survey

Processing

- Cleaning
- Aligning
- Integrating

Analysing

- Statistics
- Machine Learning
- Exploring

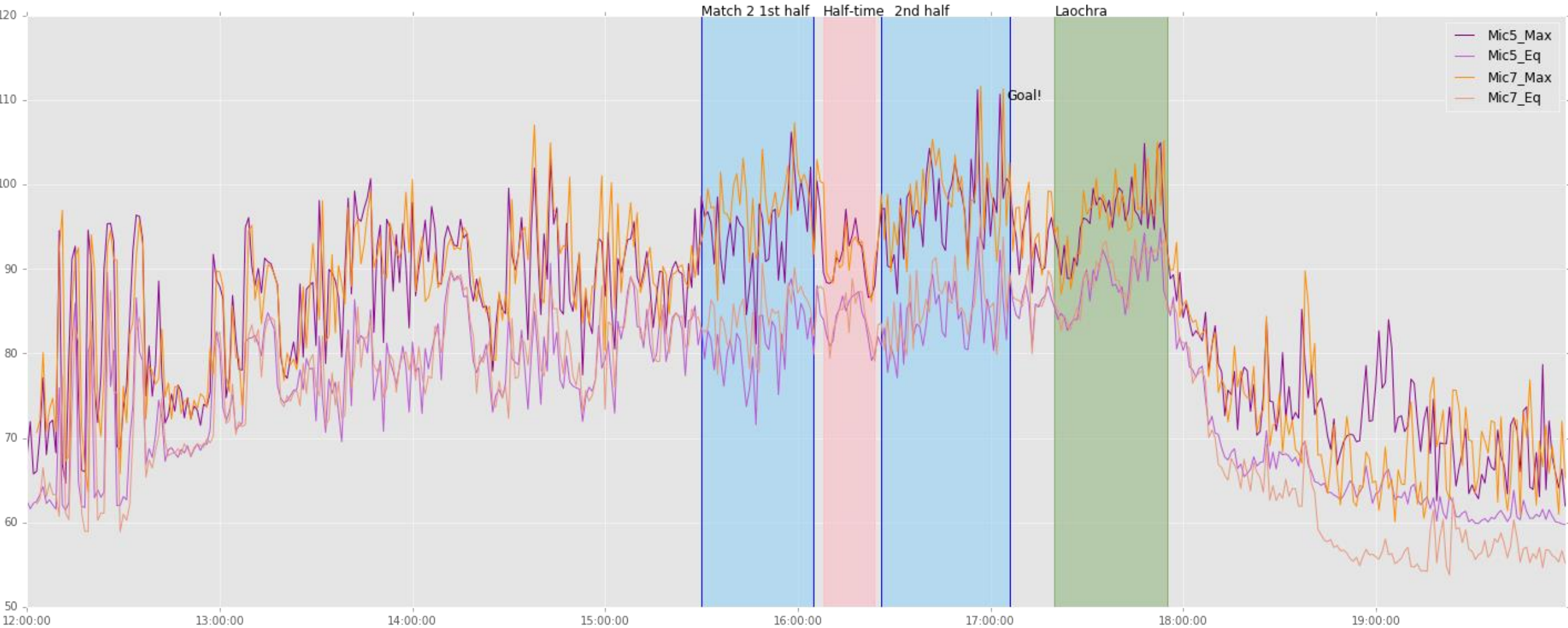
Presenting

- Visualisations
- Communication
- Actionable

Preserving

- Storing
- Management
- Re-use

Decibel Levels, Croke Park, 2016





How loud

#SmartCrokePark

Dublin enter

Mayo enter

Dublin first score

Mayo goal



Smart Stadium for Smarter Living

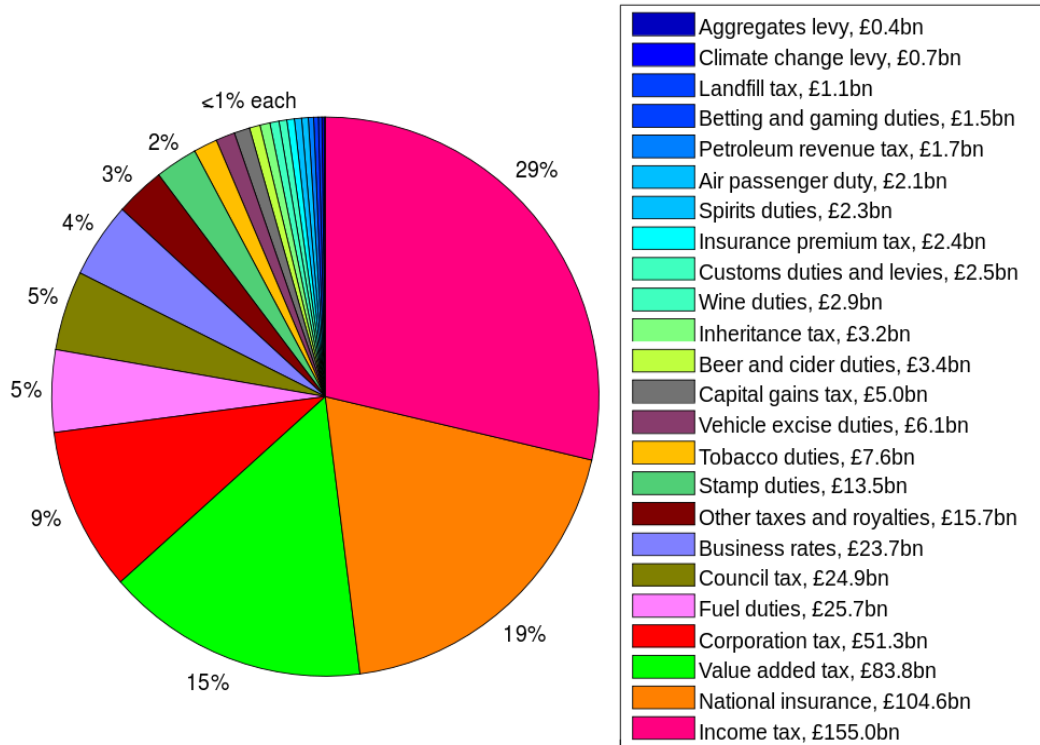


Outline

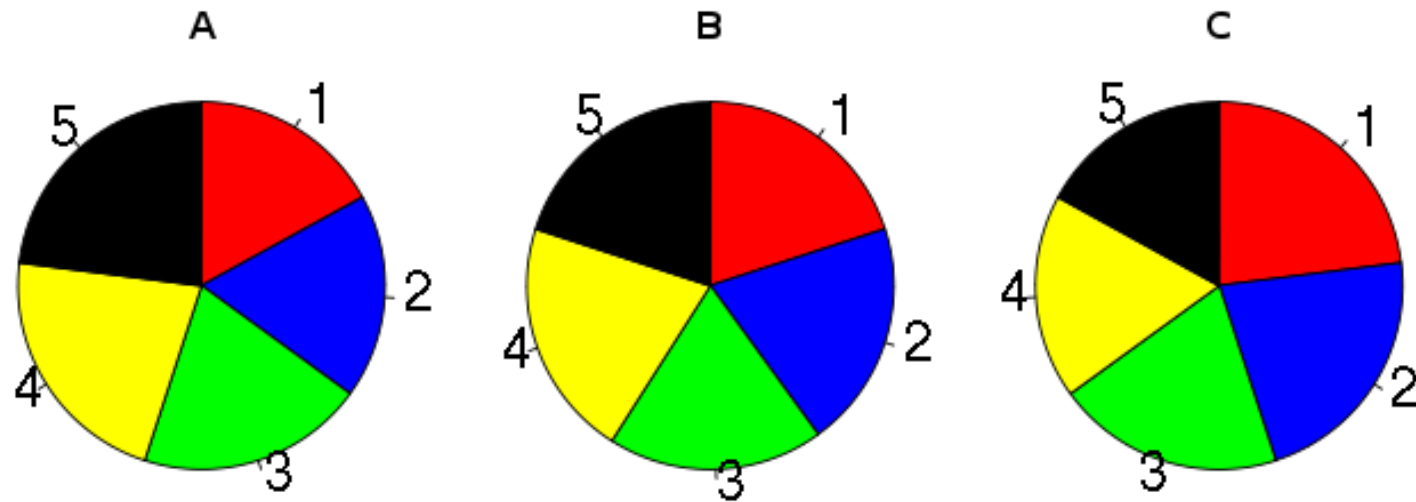
- Why visualise data?
- Good things to know
 - Pie charts
 - 3D
 - Area
 - Axes
 - Clutter
- Good Visualisation?

Good things to know: Pie Charts

Almost never a good idea ...



https://en.wikipedia.org/wiki/Taxation_in_the_United_Kingdom

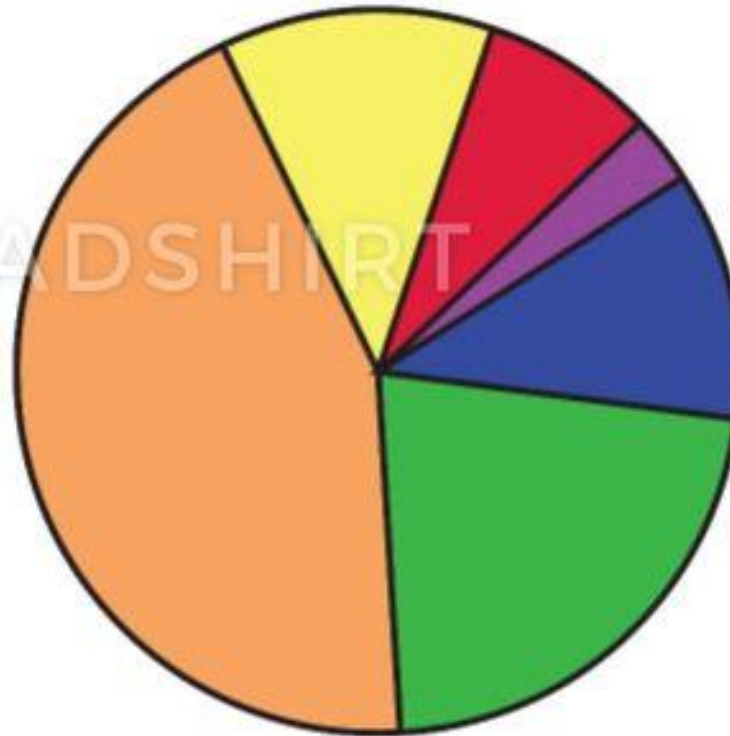


If you *must* use a pie chart

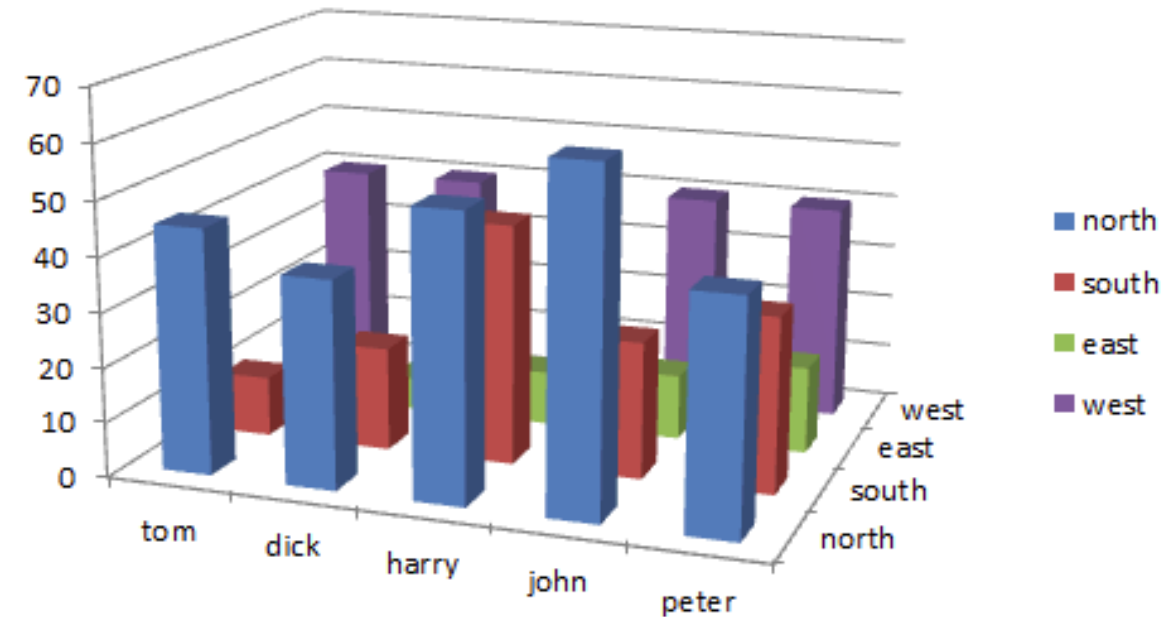
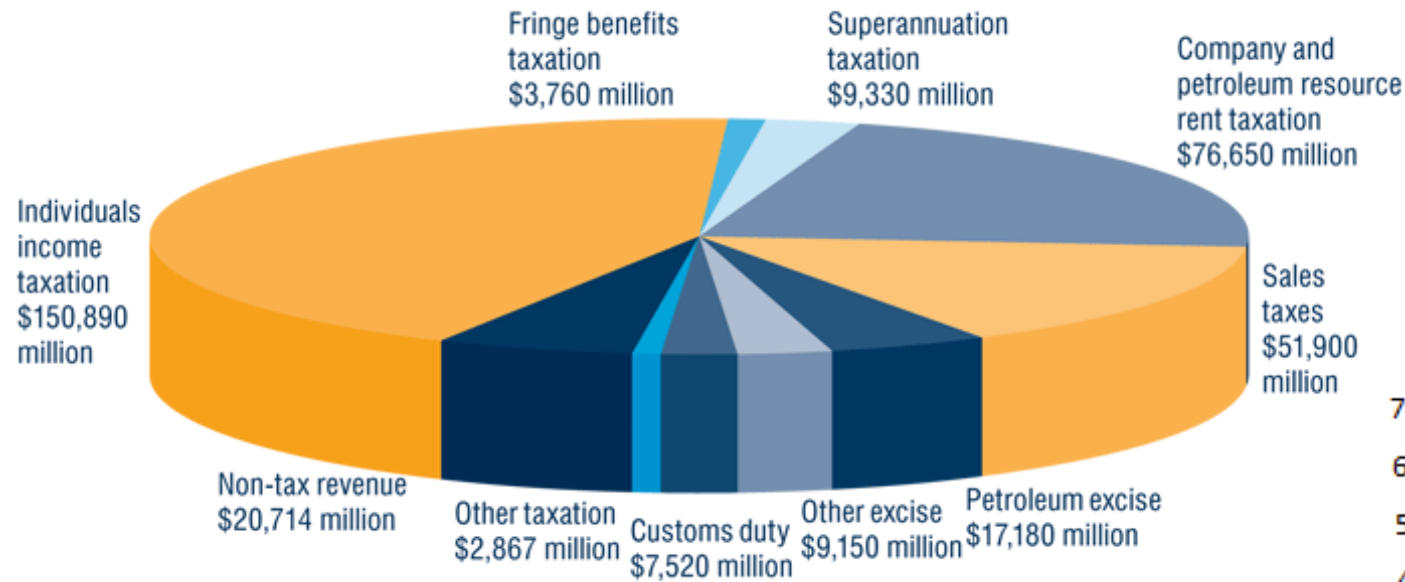
- Only for parts of a whole (ie, 100% divided into categories)
- No more than 5 slices
- Label carefully and clockwise, decreasing in size
 - Minimise user effort
- Never 3D and exploded isn't good either!
 - But it looks cool ... ☹️

THINGS I WILL NEVER DO

-  Give you up
-  Let you down
-  Run around & hurt you
-  Make you cry
-  Say goodbye
-  Tell a lie and hurt you

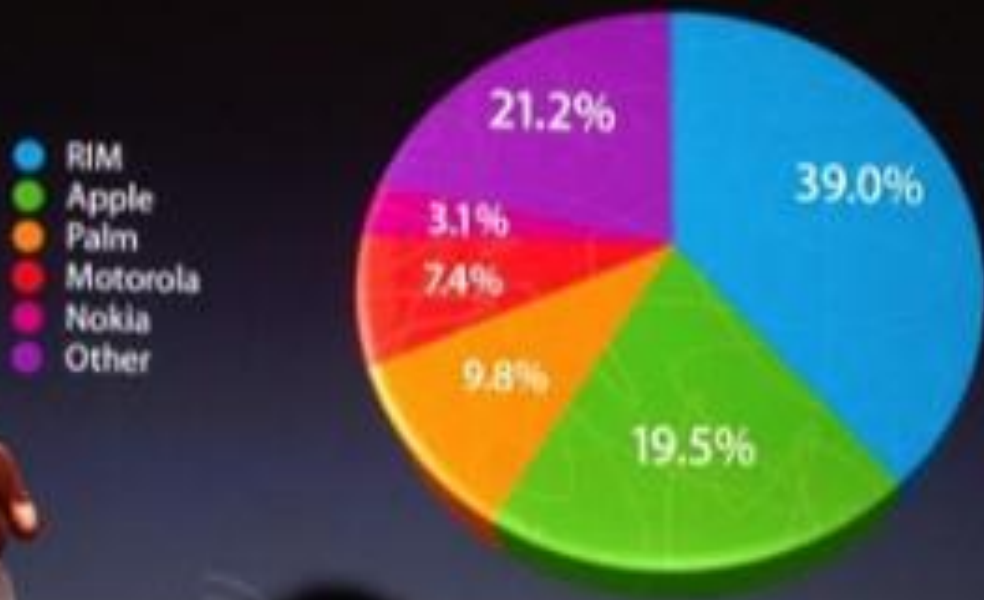


Good things to know: 3D



http://www.budget.gov.au/2011-12/content/overview/html/overview_46.htm

U.S. SmartPhone Marketshare



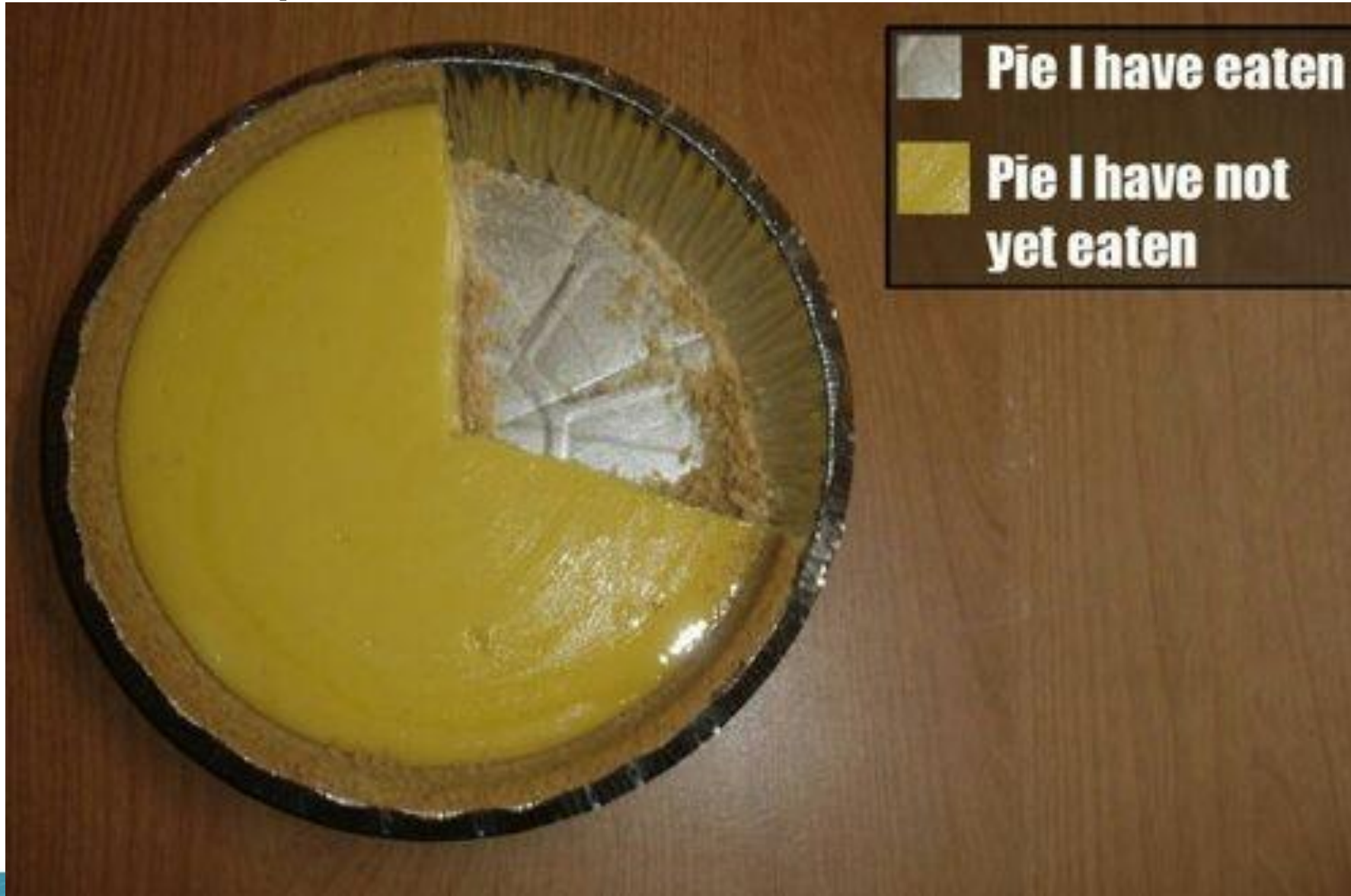
Another (infamous) example

Jobs at Engadget 2008

Compare 21.2% and 19.5%

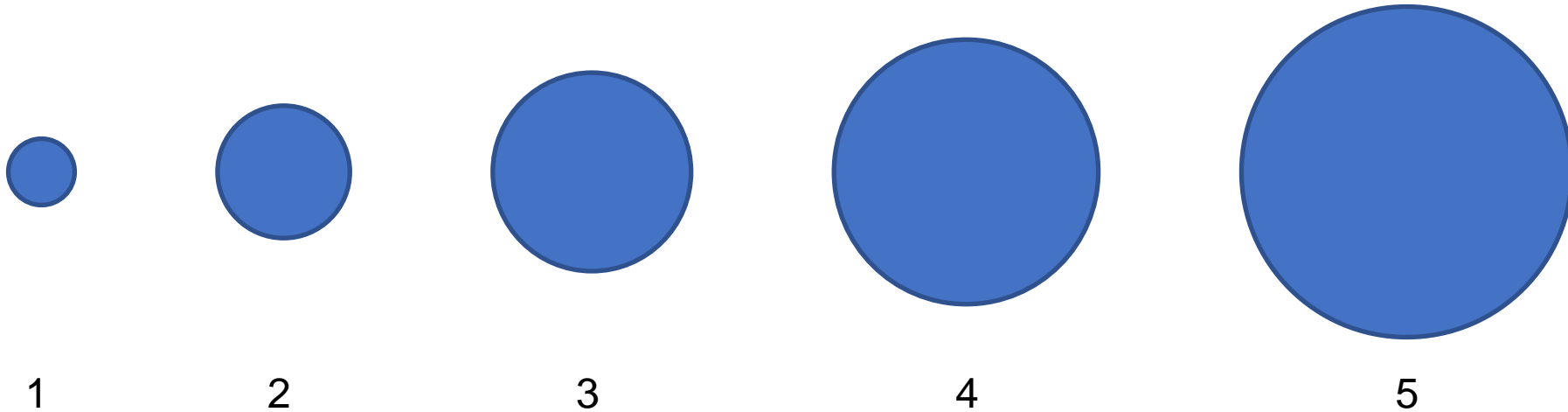
Which is bigger?

A good example?

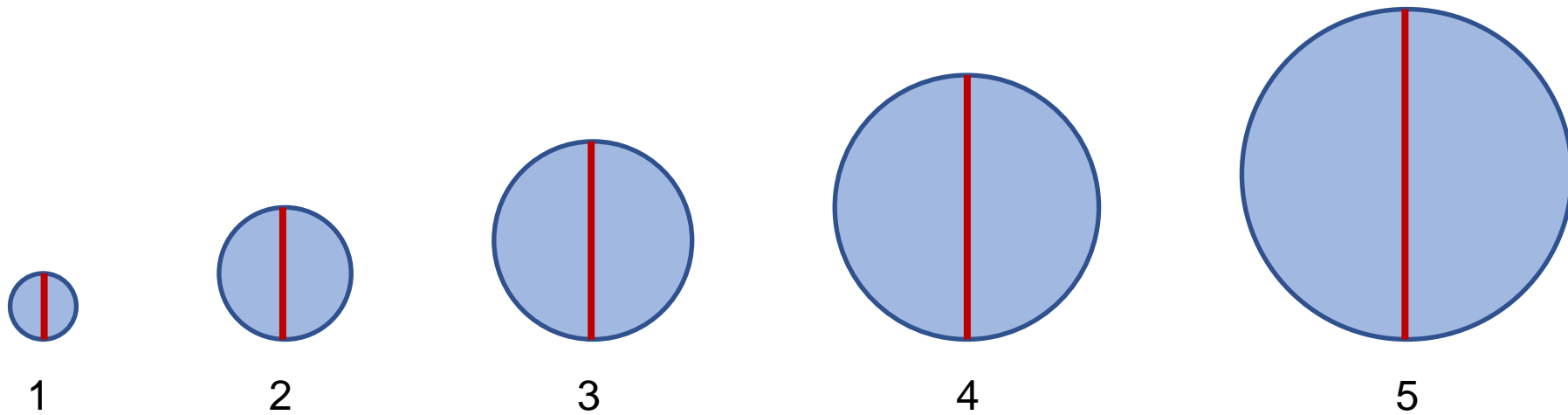


Good things to know: understanding area

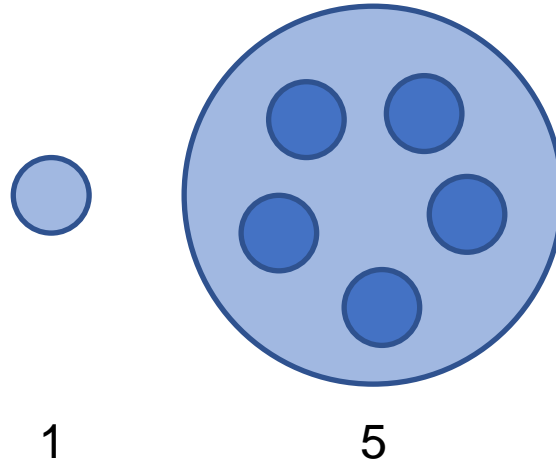
Be careful when turning numbers into shapes ...



Good things to know: understanding area

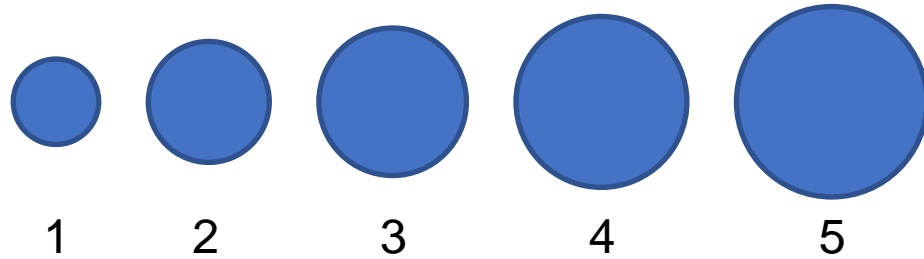


Good things to know: understanding area

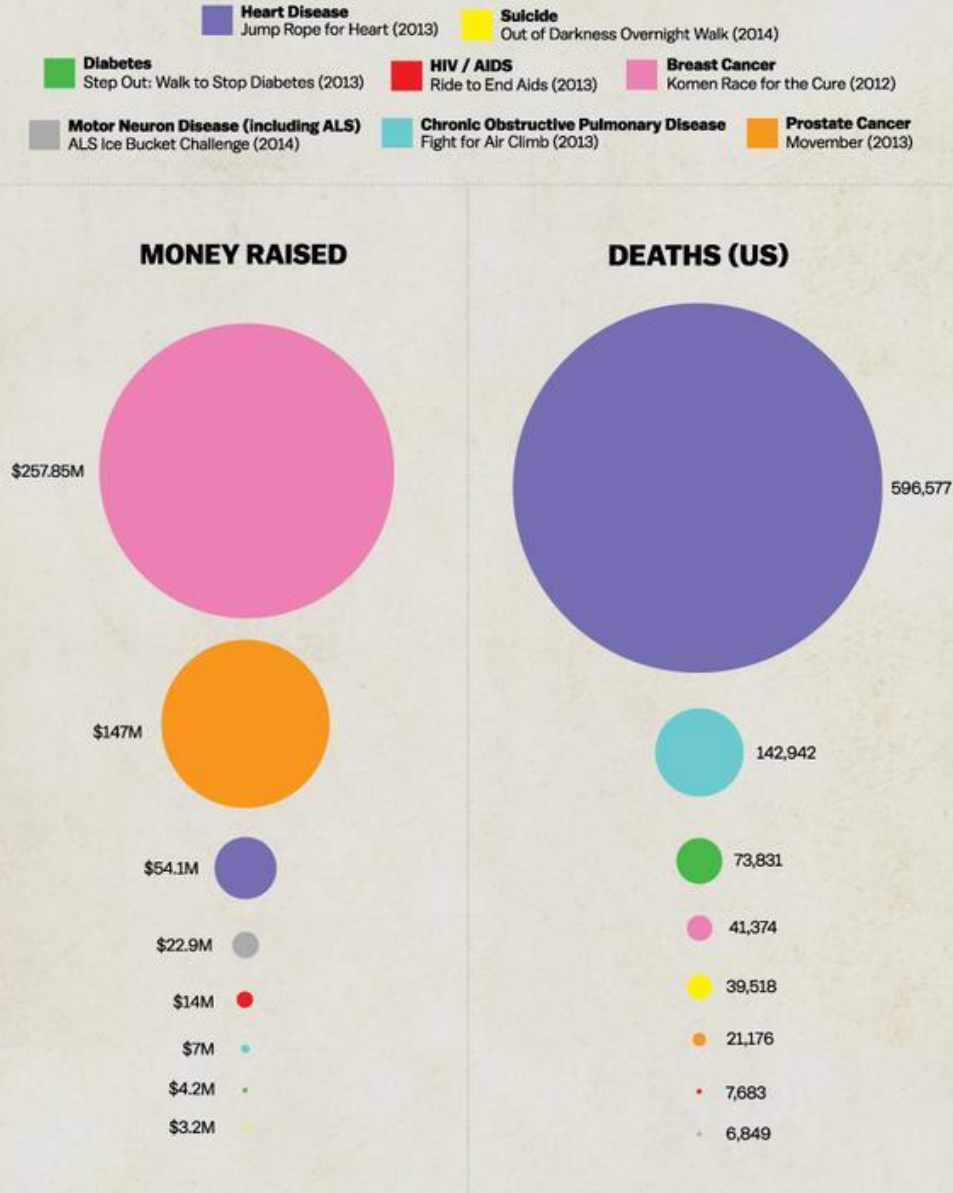


Good things to know: understanding area

$$A = \pi r^2$$



WHERE WE DONATE VS. DISEASES THAT KILL US



Source: CDC (2011)



- What does colour indicate?
- How much do your eyes move?
 - Is it easy to compare?
- Highly specific numbers
- Area or diameter?
- Data from 2011 but dates are 2013/2014?

WHERE WE DONATE VS. DISEASES THAT KILL US

- Heart Disease

Jump Rope for Heart
- Diabetes

Step Out: Walk to Stop Diabetes
- Motor Neuron Disease (including ALS)

ALS Ice Bucket Challenge
- Suicide

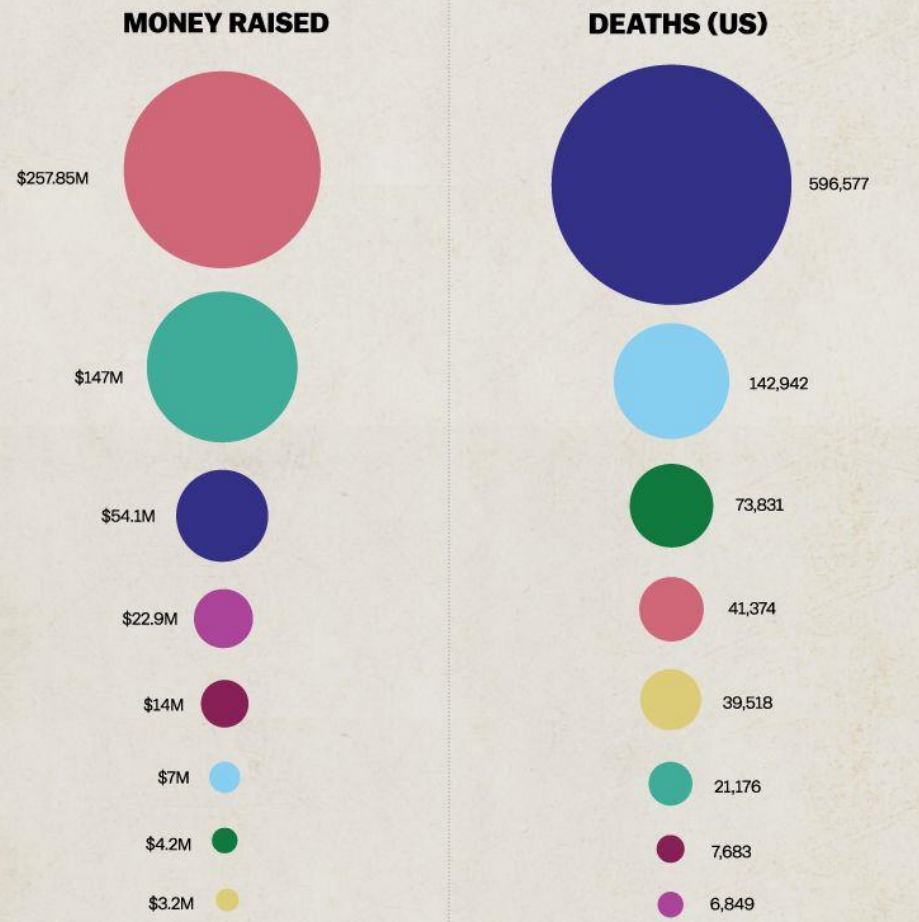
Out of Darkness Overnight Walk
- HIV / AIDS

Ride to End Aids
- Chronic Obstructive Pulmonary Disease

Fight for Air Climb
- Breast Cancer

Komen Race for the Cure
- Prostate Cancer

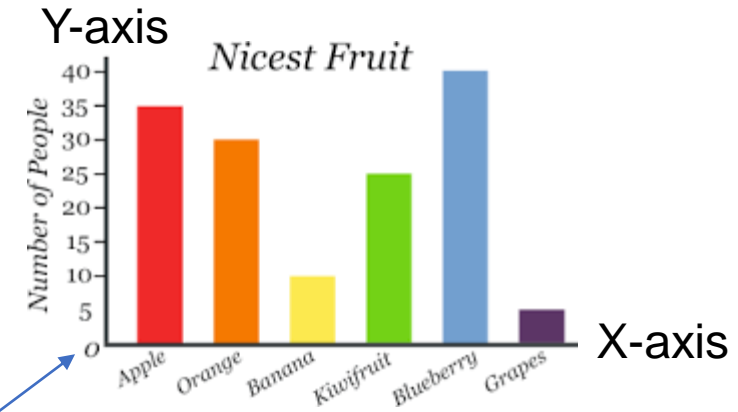
Movember



<http://www.vox.com/2014/8/20/6040435/als-ice-bucket-challenge-and-why-we-give-to-charity-donate>

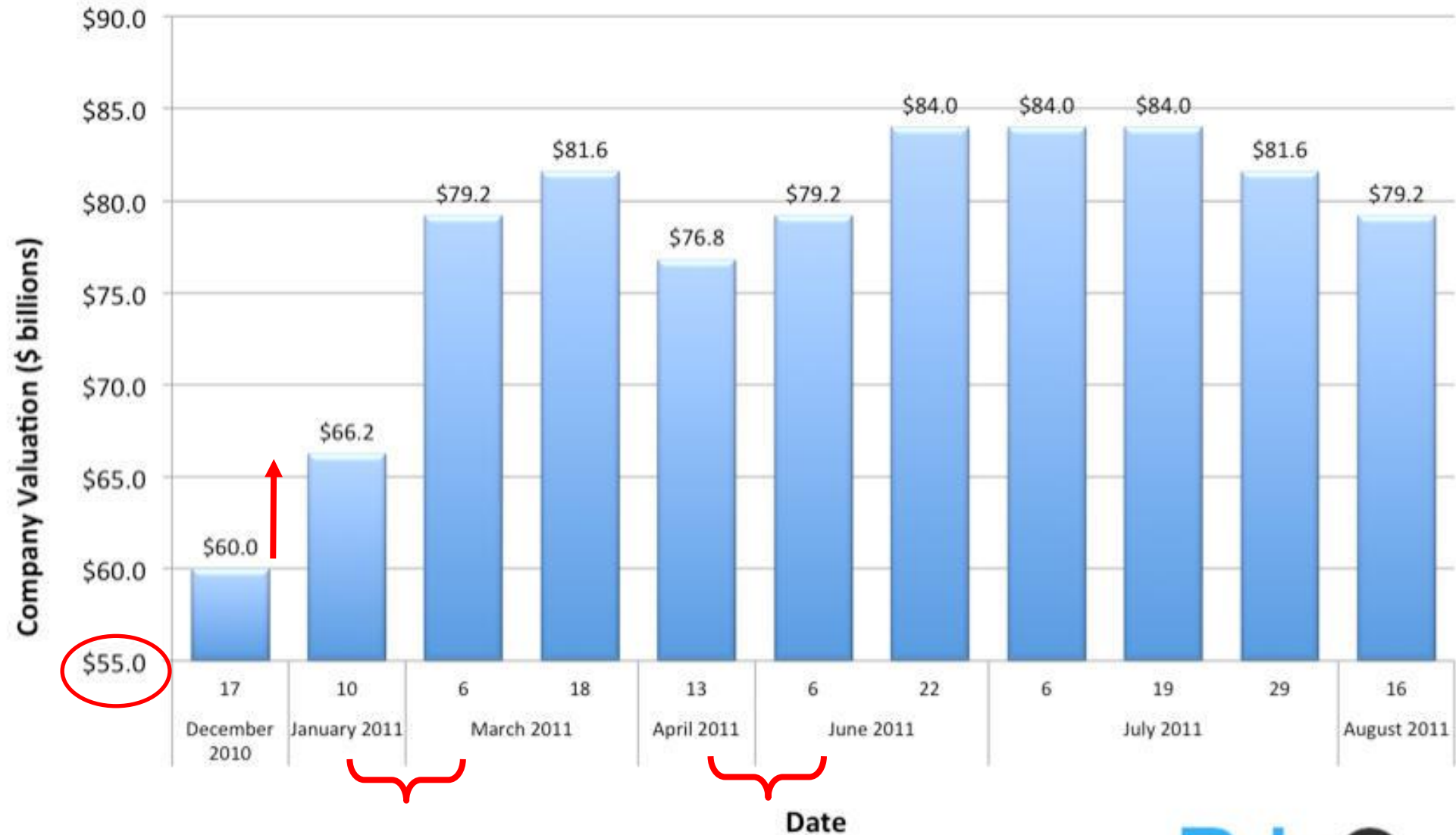
Good things to know: axes

- Label properly
- Include units
- Be careful with exponential
- Where's your baseline? Start from zero.

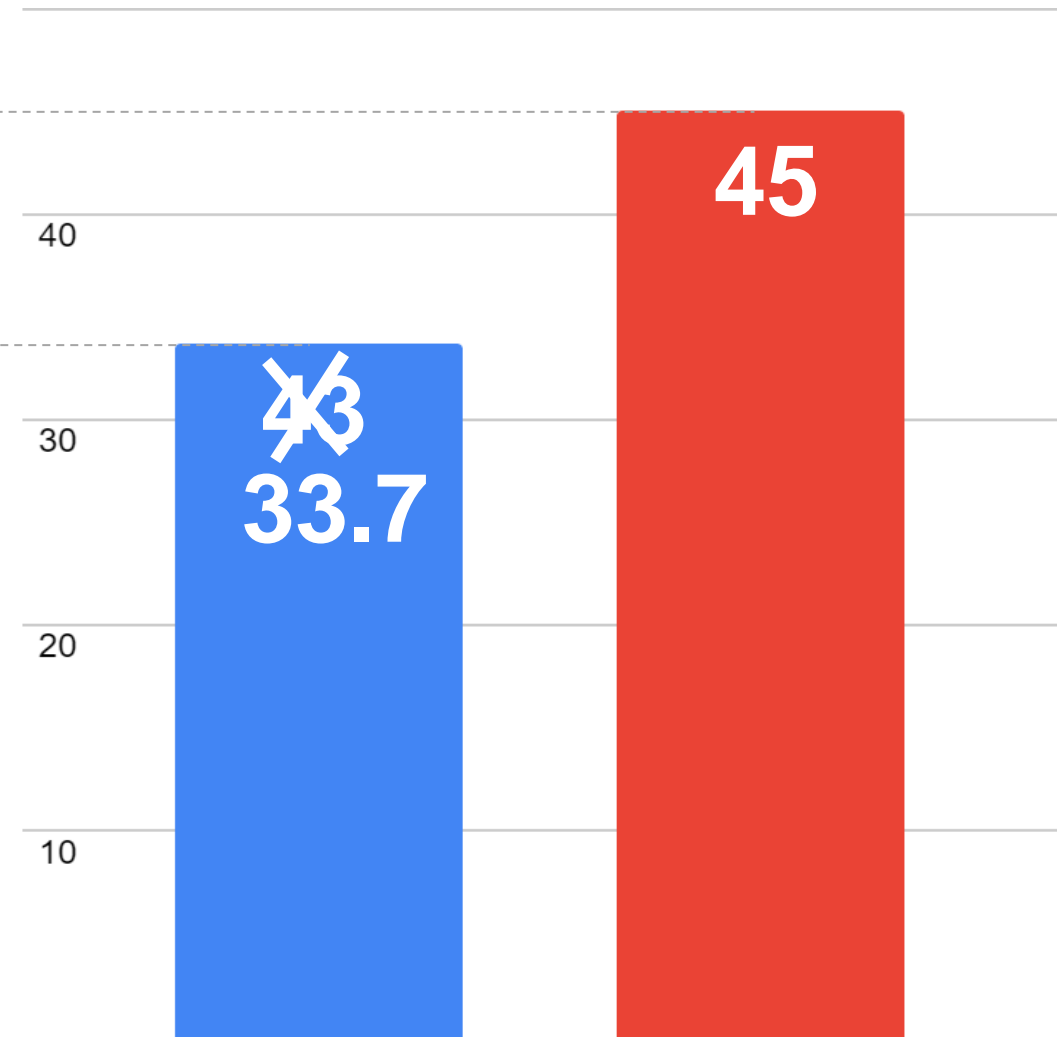


<https://thenode.biologists.com/non-zero-baselines-the-good-the-bad-and-the-ugly/resources/>

Facebook, Inc.: Company Valuation



<http://www.privco.com/research/facebook-valuation-suffers-first-ever-consecutive-drop-august-24-2011>



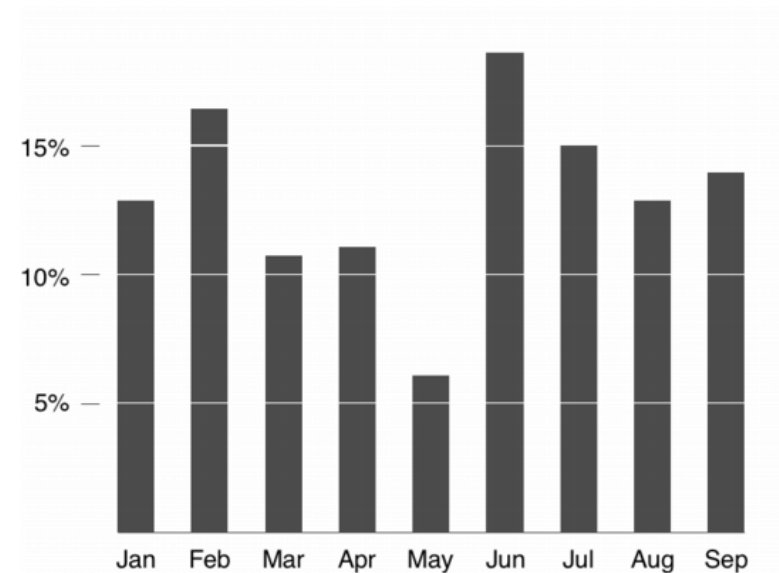
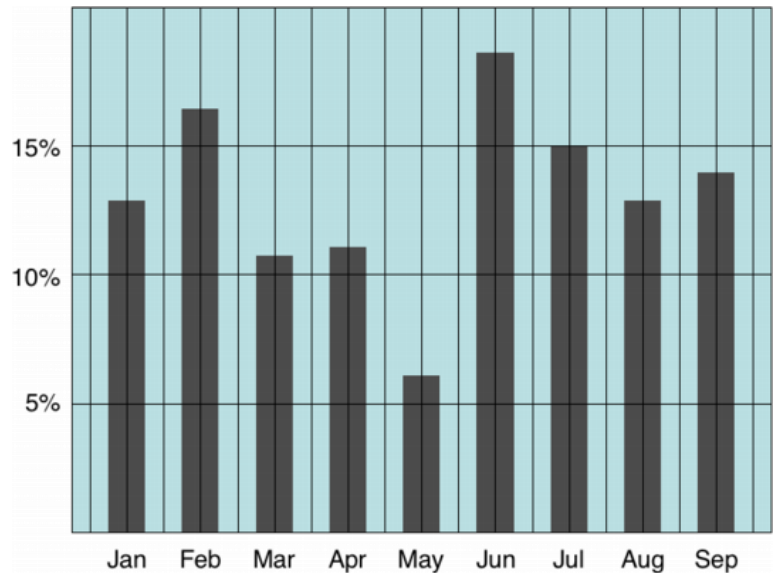
<https://www.washingtonpost.com/graphics/politics/2016-election/trump-charts/>

Good things to know: Remove Clutter

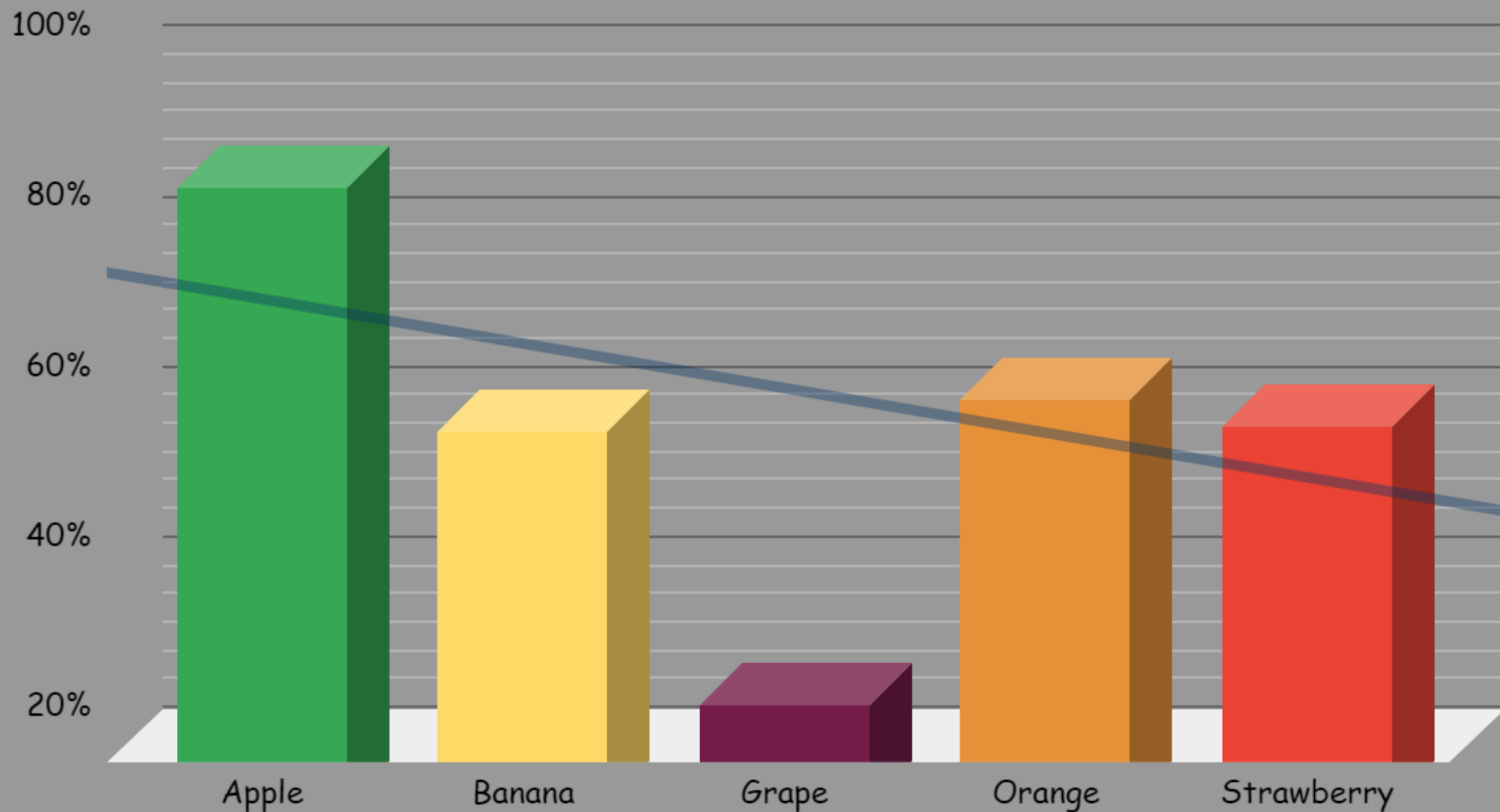
Edward Tufte: data to ink ratio

Remove all pixels not directly related to data

- Highly minimalist approach



Popularity of fruit flavours



Take away points

- What are you trying to say?
- Pie (and donuts!) in moderation only!
- Apply data-to-pixel method to remove unnecessary elements (Marie Kondo your graph?)
- Title should state the message/conclusion and right align
- Be kind to your viewer! Attention not distraction.