

MIS 0855 Spring 2015 – Data Science

Day 17 – Avoiding Data Distortion

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Which is the largest U.S. state by land area?



<http://www.mapsofworld.com/usa/usa-state-and-capital-map.html>



United States









An **interactive** list of U.S. States, including their (2012) populations, as well as land sizes and densities.

Click on any of the bolded headings to sort this state list.

Type the name of a state you're looking for in the search bar to find its individual stats.

Show entries

Search:

	 STATE 	Abbr. 	Population 	Land Area (sq. km.) 	Pop. Density (per sq. km.) 	Land Area (sq. mi.) 	Pop. Density (per sq. mi.) 
1	Alaska	AK	731,449	1,481,346.00	0.46	571,951	1.20
2	Texas	TX	26,059,203	678,051.12	35.88	261,797	92.92
3	California	CA	38,041,430	403,931.96	91.00	155,959	235.68
4	Montana	MT	1,005,141	376,977.95	2.57	145,552	6.65
5	New Mexico	NM	2,085,538	314,310.60	6.31	121,356	16.35

Don't mess with Alaska!

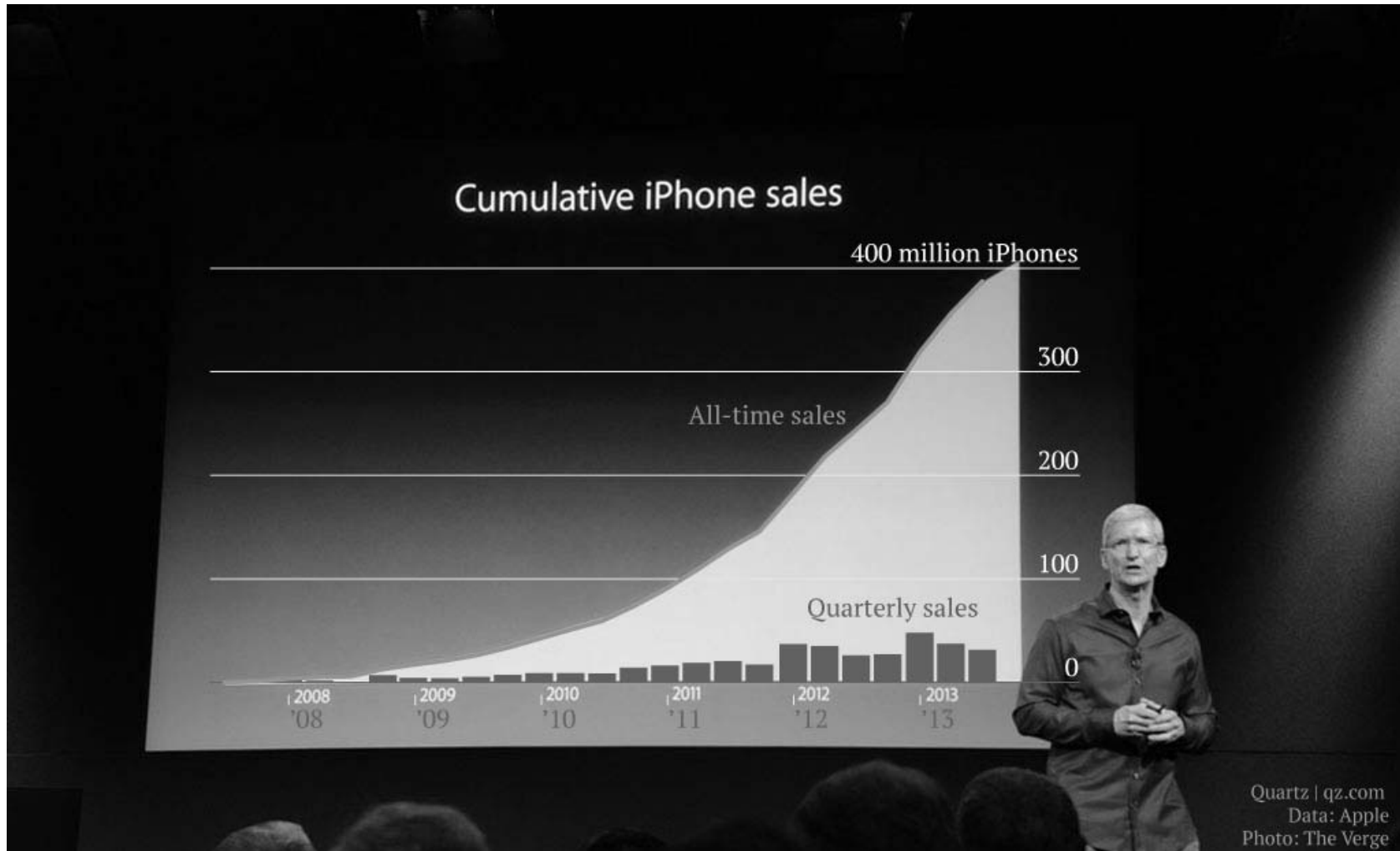


Tim Cook is Cooking His Graph!



<http://qz.com/122921/the-chart-tim-cook-doesnt-want-you-to-see/>

This looks less cool, but less misleading.

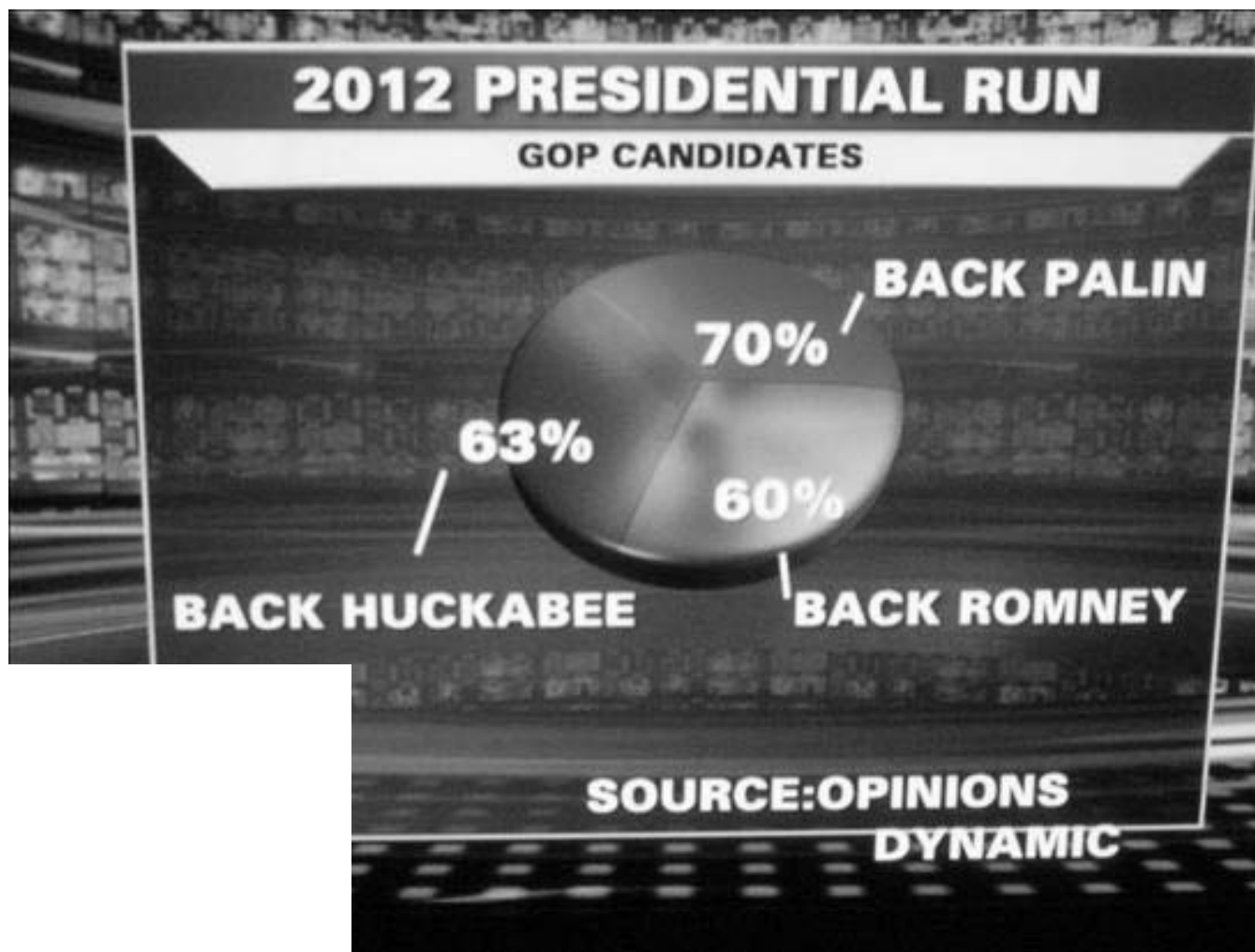


What are Misleading Graphs?

Any graph that distracts the reader from fully understanding what he/she is viewing can be considered misleading.

- ✓ *graphs with no title*
- ✓ *graphs with no labels on the axes*
- ✓ *graphs with no key - when one is required*
- ✓ *graphs with a vertical axis that doesn't start at 0*
- ✓ *graphs with different sized graphing icons or bars*
- ✓ *graphs without equal intervals on any axis*
- ✓ *graphs with a "broken" or "squished" axis*

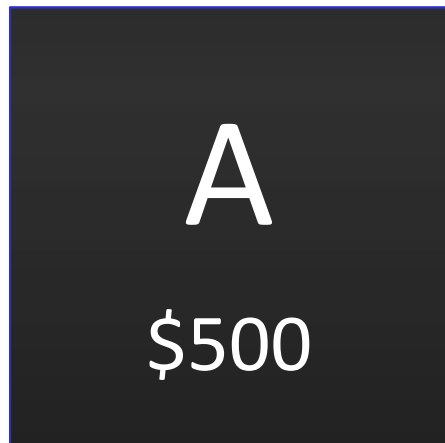
70% + 63% + 60% = ?



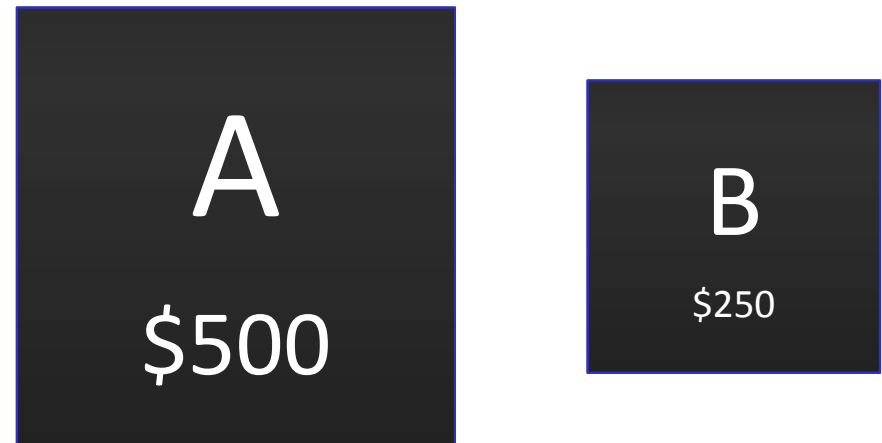
Can you guess the source of this?



2 X 2 = 4, not 2!



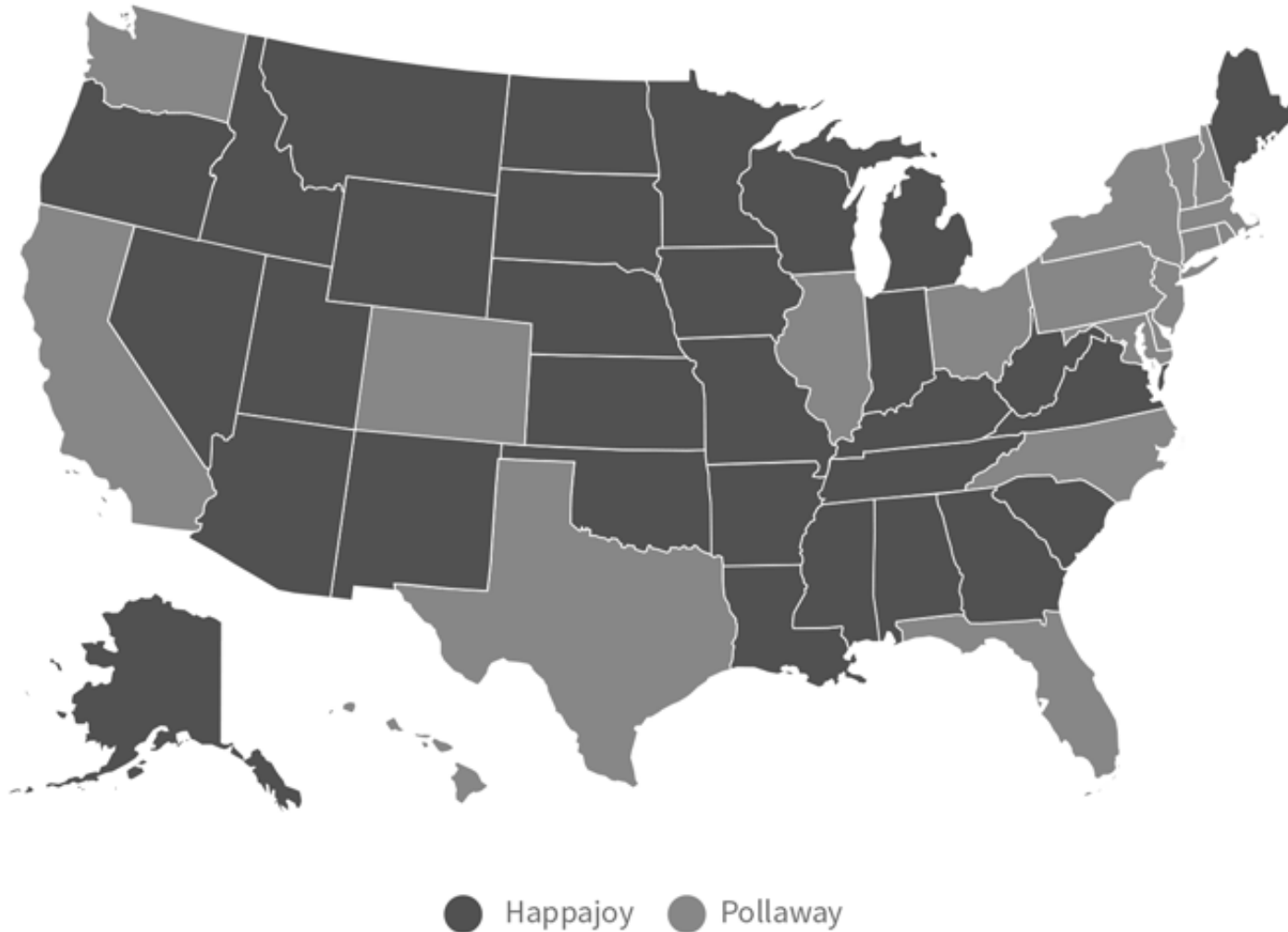
**WIDTH of A is twice width of B,
but AREA of A is 4x area of B!
Overstates relative value by
factor of two!**



**WIDTH of A is 1.4x width of B,
so area of A is now 2x area of B!**

Which company is the market leader?

Leading Allergy Medication in Each State



Market Share in Each State

