

# *Incorporating Technology to Achieve Excellence in Data Visualization*

*Assessment Institute  
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## **Session Learning Outcome 1**



**Visual Presentation**



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## Session Learning Outcome 2



VISUAL EXCELLENCE

data

PRESENTATIONS

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## Overview



1. Growing Interest in Data Visualization



2. Principles and Processes for Data Visualization  
(Edward Tufte)



3. Technology Tools for Data Visualization



4. Collaborative Activities

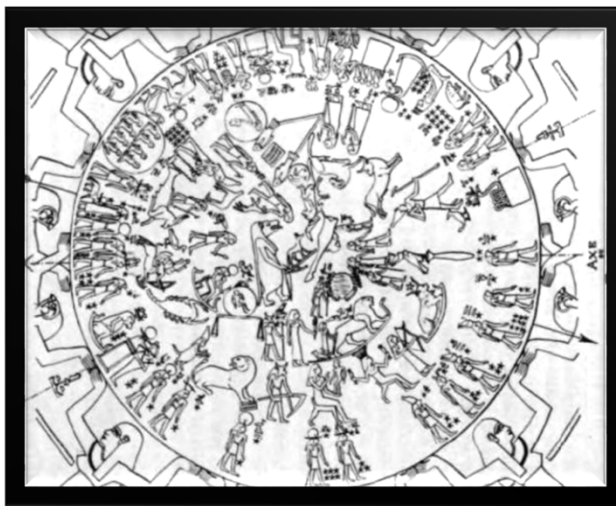
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## 1. Growing Interest in Data Visualization

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## Early Data Visualization

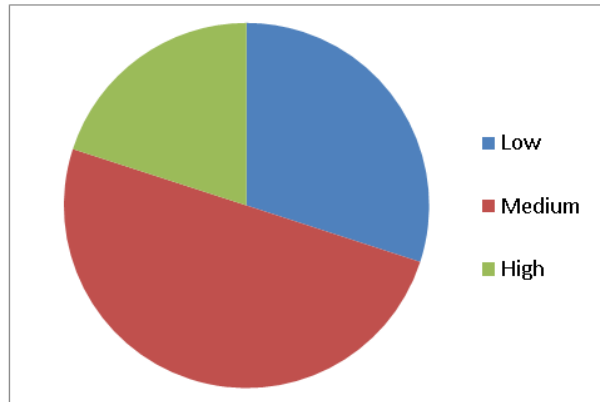


<http://pics-about-space.com/ancient-egyptian-astronomy-chart?p=1#img6110296666893470338>

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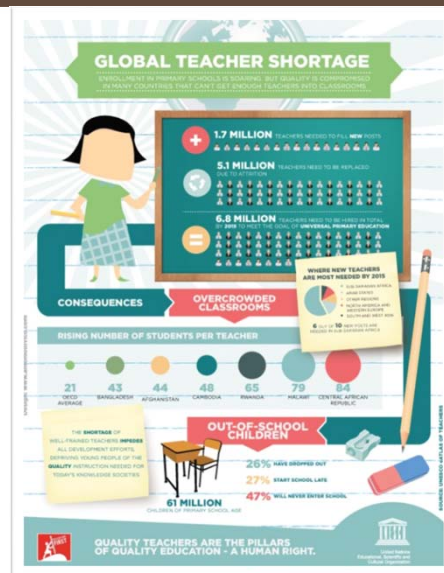
## What is Data Visualization?

Low	30
Medium	50
High	20



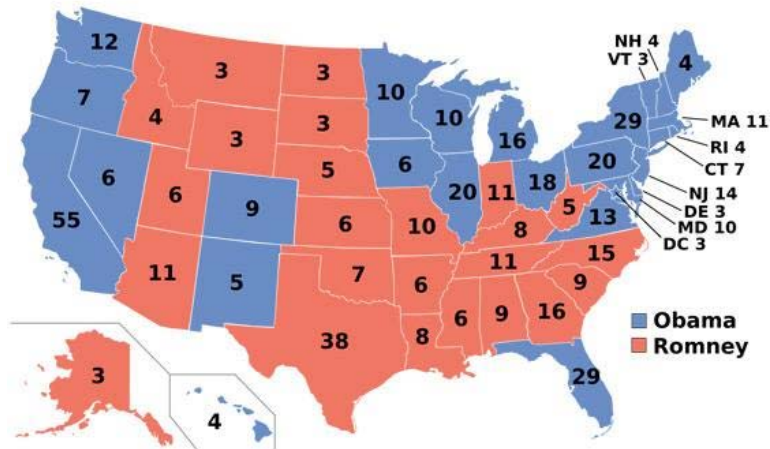
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## What is Data Visualization?



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## What is Data Visualization?



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## What is Data Visualization?

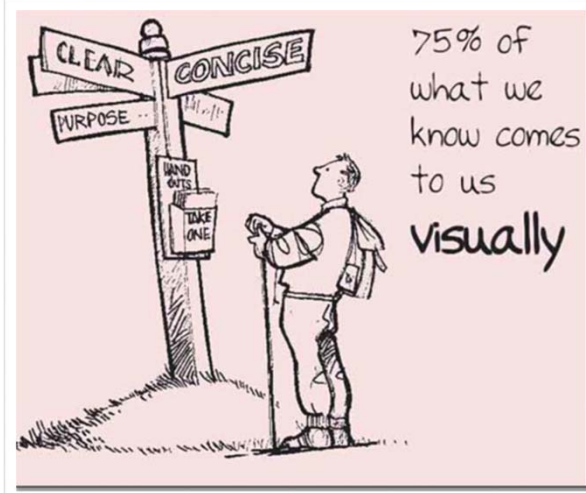
### 2012 Electoral College Map

(based on a weighted average of state polls)



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## Why Data Visualization?



<http://projectassistant.org/branding/visual-graphic-design/>

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## Uses of Data Visualization



<https://martygabler.files.wordpress.com/2012/06/gain-understanding-e1338642302334.jpg>



<http://www.itap.purdue.edu/learning/images/innovate/communicate.png>

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## Technology and Data Availability



<http://siliconangle.com/files/2011/08/access.jpg>

<http://www.clearedgemarketing.com/wp-content/uploads/2013/07/f1-not-equal-sign.jpg>

<http://fergusonvalues.com/wp-content/uploads/2012/10/Excellence-Just-Ahead.jpg>

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## Planning for Excellence in Data Visualization (Fry, 2008)

1. We Face Information Overload.
2. We Are Better at Data Collection.
3. We Need More Sophisticated Thinking About Data.
4. We Know Data Never Stay the Same.
5. We Must Remember the Reason for Data Collection.
6. We Must Draw Insights from Diverse Fields.

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# Fry's Seven Stages of Data Visualization



Acquire



Parse



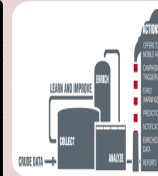
Filter



Mine



Represent



Refine



Interact

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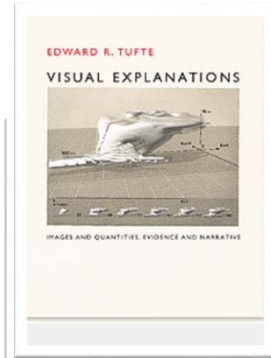
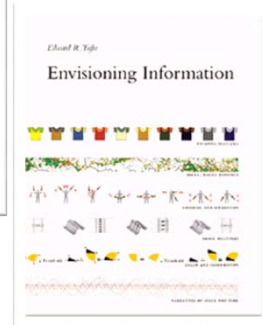
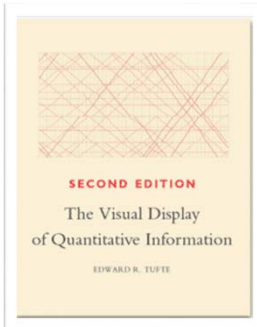


2. Principles and Processes for Data Visualization  
(Edward Tufte)

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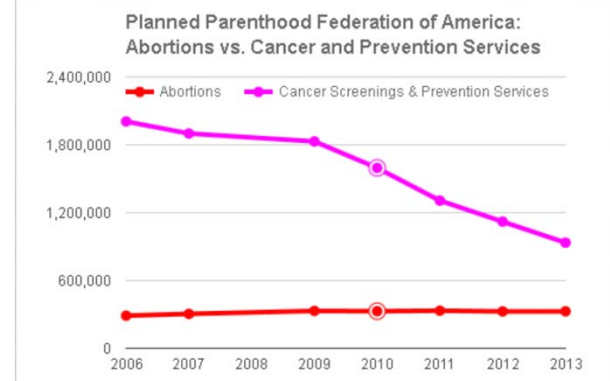
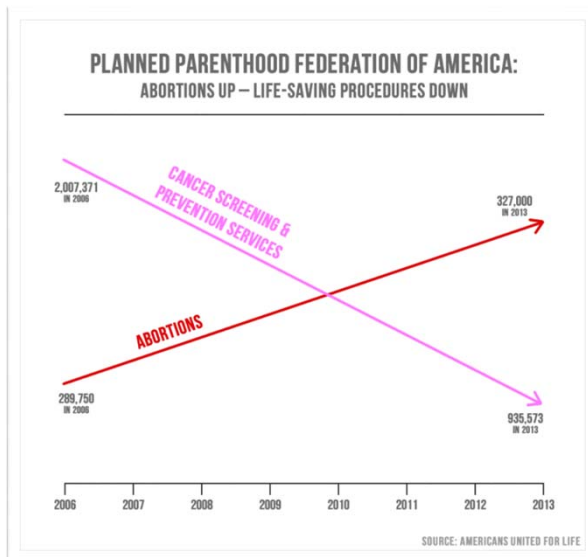


## Who is Edward Tufte?



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## Tufte's Principle of Graphical Integrity 1



<http://www.politifact.com/truth-o-meter/statements/2015/oct/01/jason-chaffetz/chart-shown-planned-parenthood-hearing-misleading/>

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**Would you buy this? Why?**



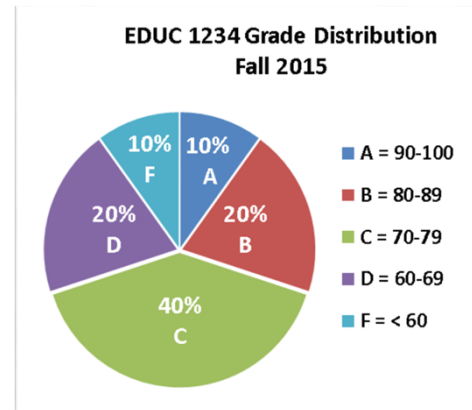
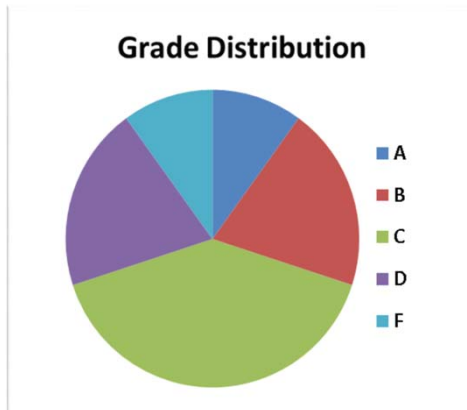
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**Or Would You Buy This? Why?**



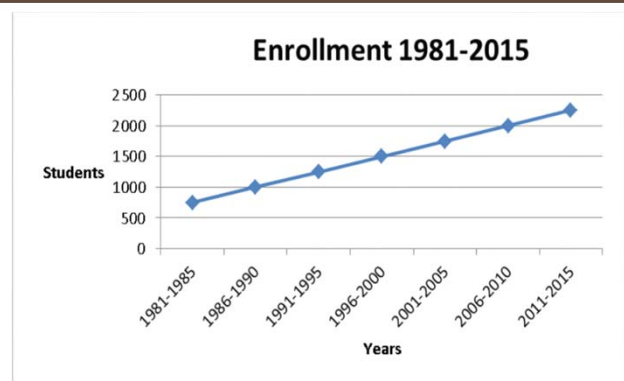
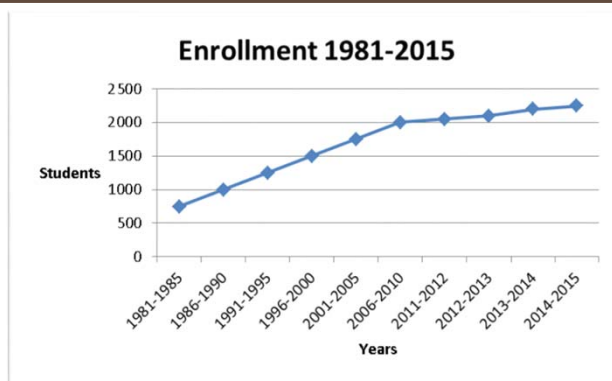
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## Tufte's Principle of Graphical Integrity 2



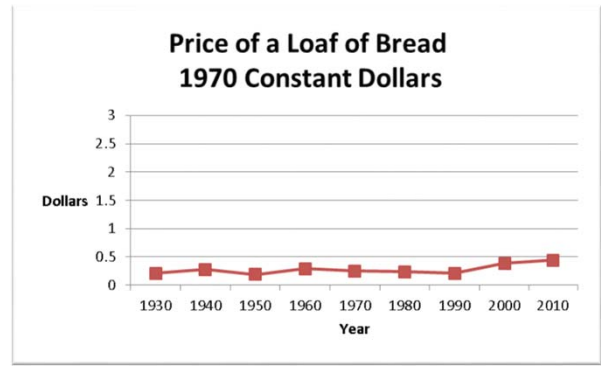
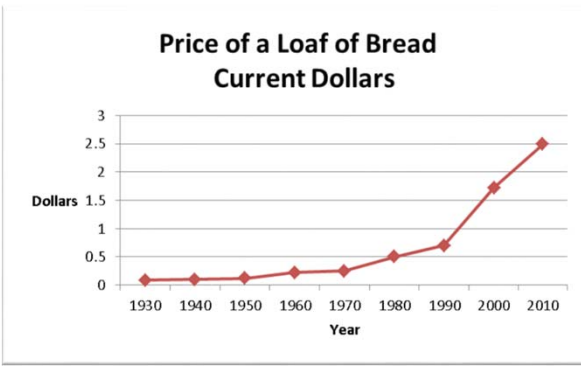
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## Tufte's Principle of Graphical Integrity 3



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## Tufte's Principle of Graphical Integrity 4



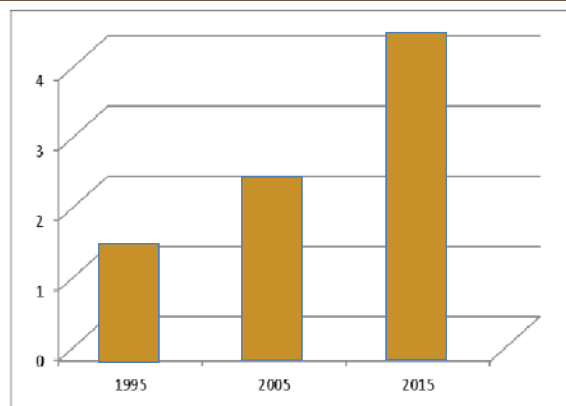
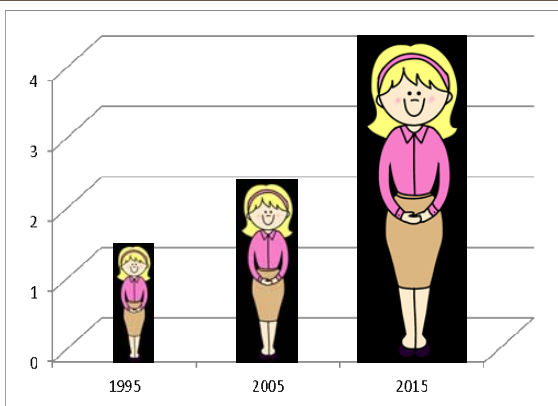
<https://www.google.com/#q=cost+of+loaf+of+bread>

<http://www.thepeoplehistory.com/pricebasket.html>

[http://www.bls.gov/data/inflation\\_calculator.htm](http://www.bls.gov/data/inflation_calculator.htm)

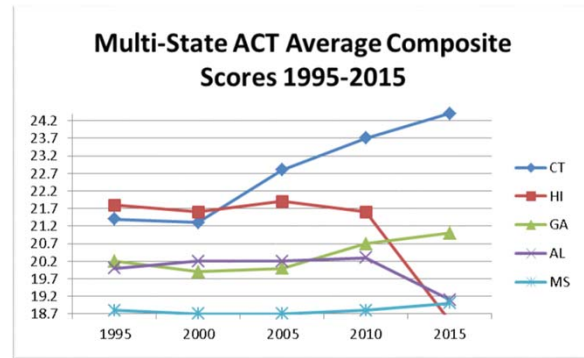
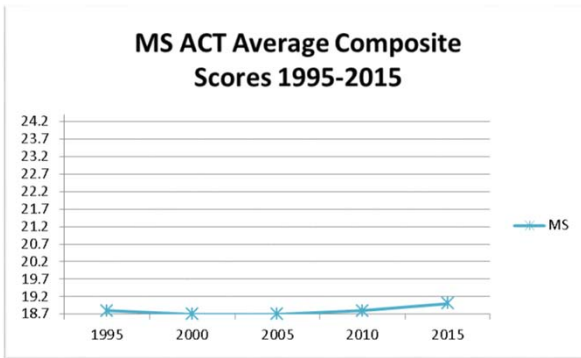
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## Tufte's Principle of Graphical Integrity 5



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## Tufte's Principle of Graphical Integrity 6



<http://www.act.org/newsroom/act-national-and-state-scores/>

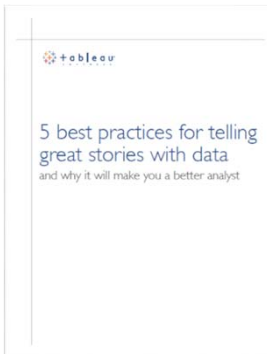
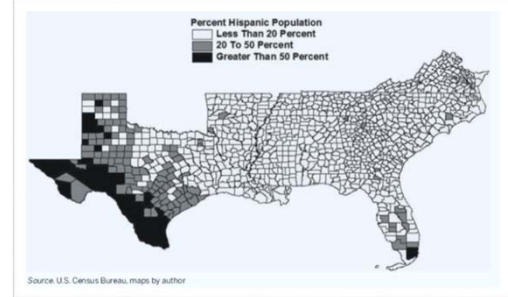
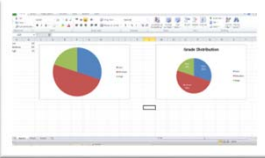
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### 3. Technology Tools for Data Visualization

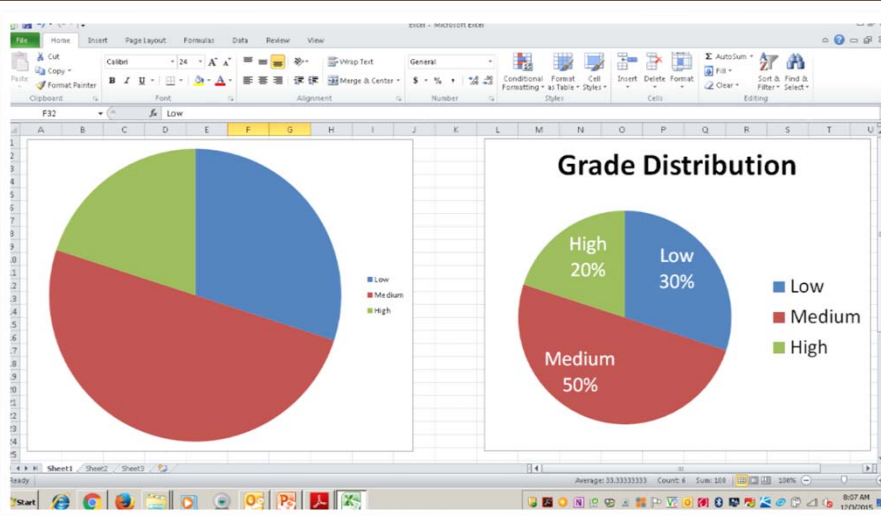
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# Overview of Tools for Data Visualization



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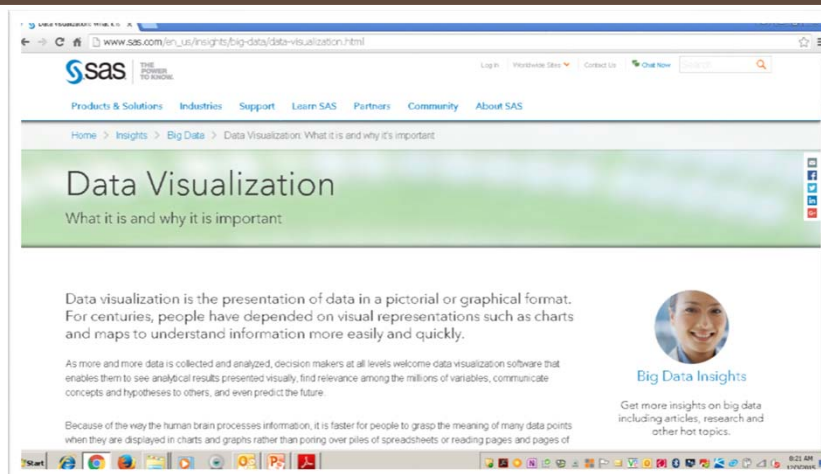
## Excel



Low	30
Medium	50
High	20

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# SAS



[http://www.sas.com/en\\_us/insights/big-data/data-visualization.html](http://www.sas.com/en_us/insights/big-data/data-visualization.html)

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# STATA

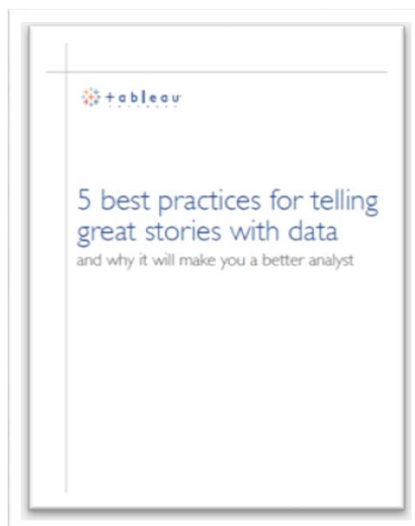


<http://www.stata.com/>

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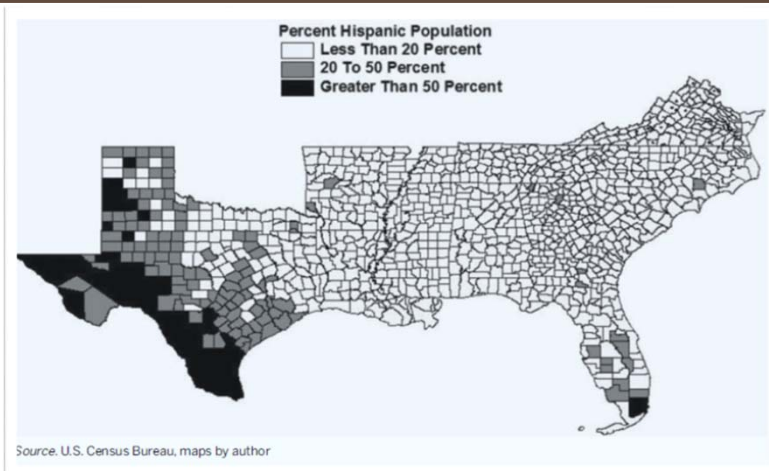
## Tableau



<http://www.tableau.com/>

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## GIS - ESRI



Peralta, J. S. & Larkin, G. R. (2011). Counting those who count: The impact of Latino population growth on redistricting in southern states. *PS: Political Science & Politics*, 44, 552-561.

<http://www.esri.com/>

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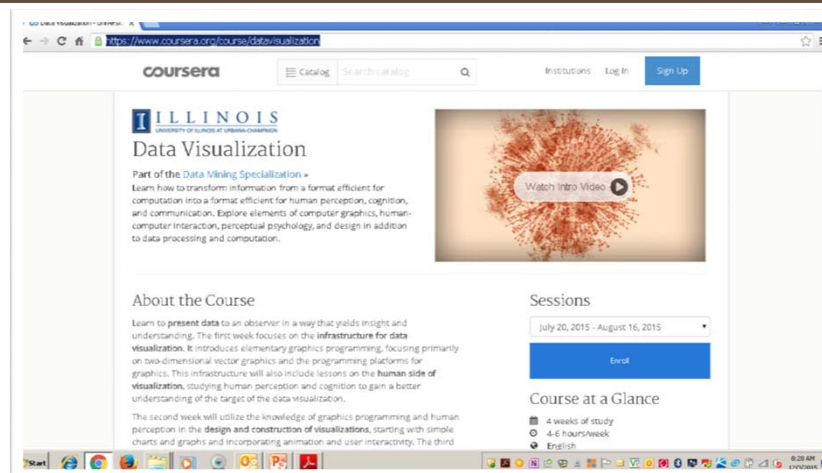
## William Jacoby's Home Page



<http://polisci.msu.edu/jacoby/>

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## Coursera



<https://www.coursera.org/course/datavisualization>

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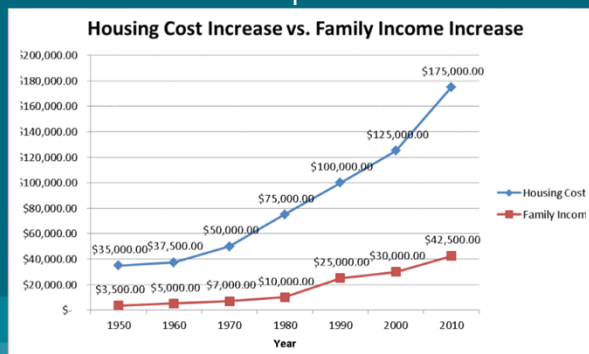
## 4. Collaborative Activities

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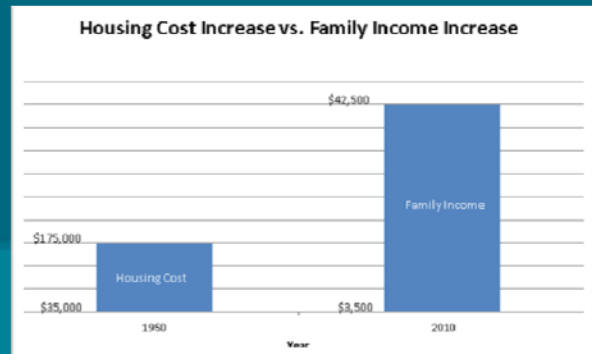
# Collaborative Activity 1A

A newspaper runs the following headline: Family Income Increases Faster than Housing Cost. Below are two graphs that illustrate the claim made in the headline. Both graphs display the same information. Which one of the graphs best represents Tufte's Principle 1 that the representation of numbers, as physically measured on the surface of the graph itself, should be directly proportional to the numerical quantities represented. Explain your answer.

Graph A



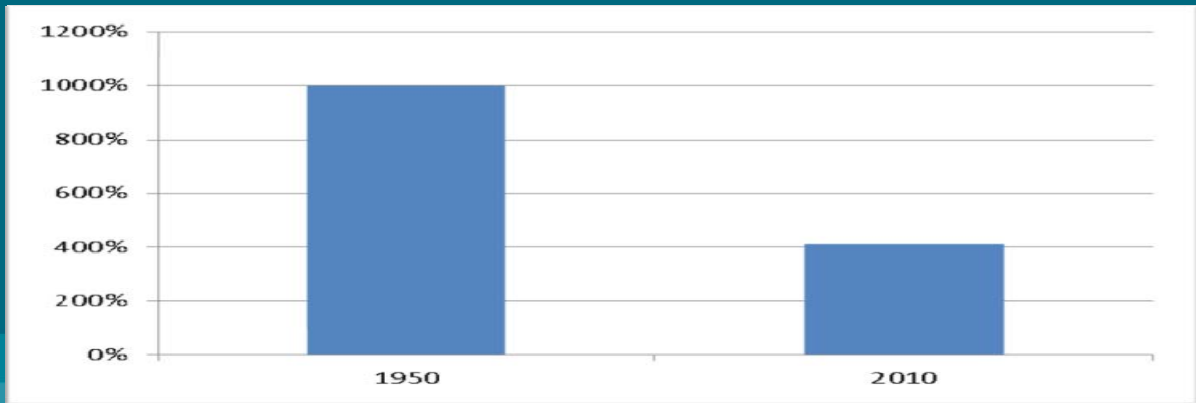
Graph B



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## Collaborative Activity 1B

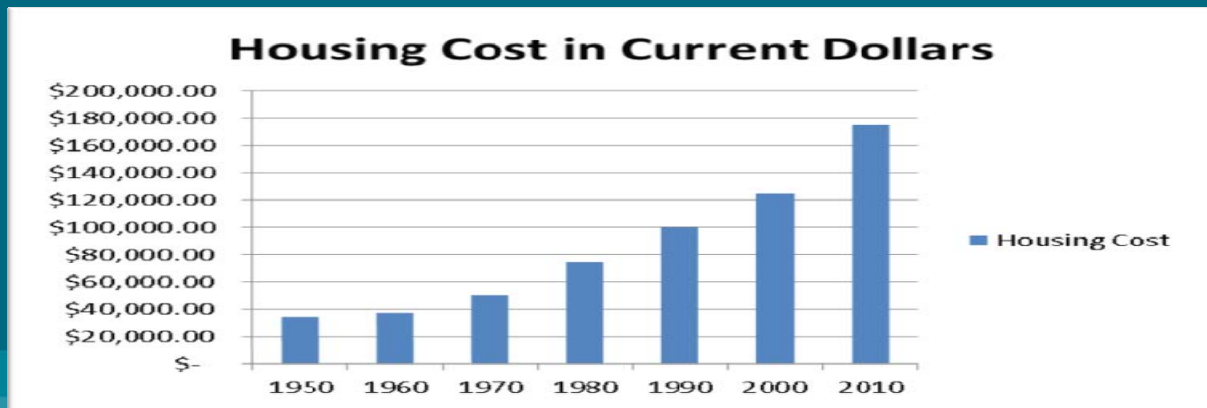
The same newspaper uses the following graph to show housing cost as a percent of family income. What is wrong with the graph?



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## Collaborative Activity 1C

If there were any doubts about the newspaper needing a new graphic design editor, the following graph should remove all doubt. What advice would you give to the newspaper regarding the following graph?



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## Collaborative Activity 1D

The final newspaper graph adds insult to injury. What is wrong with the graph?



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## Collaborative Activity 2

Design a visual representation of the following data. Do not concentrate on artistic perfection, instead try to design a visual representation of the data that incorporates one or more of Tufte's Principles. Explain your work and the principles you highlighted to the group.

Year	Average Family Income	College Tuition Cost
1975	\$ 37,500.00	\$ 1,687.50
1985	\$ 40,000.00	\$ 3,375.00
1995	\$ 42,500.00	\$ 6,750.00
2005	\$ 45,000.00	\$ 12,500.00
2015	\$ 47,500.00	\$ 25,000.00

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## Conclusion

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<http://www.personal.psu.edu/users/n/y/nyl5096/Assignment%206.html>

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