

Read Chapter 5 (Data Visualization)
of the Textbook

Pictures worth a thousand word

Human brain is good at understanding information conveyed through visualizations than just text and numbers

Principle of good Data Visualizations

- Serve a reasonably one single clear purpose
- don't over-complicated your graphs
- Encourage viewer to compare different pieces of data
- Induce viewer to think of the substance of data
- Avoid distorting what the data have to say
- Show the data with easy to understand scale
- Reveal the data at several levels of detail

Data Visualizations Toolbox

Libraries

- Matplot lib
- Pandas plot
- **Seaborn**
- Plotly
- Geographic plots

Type of Plots

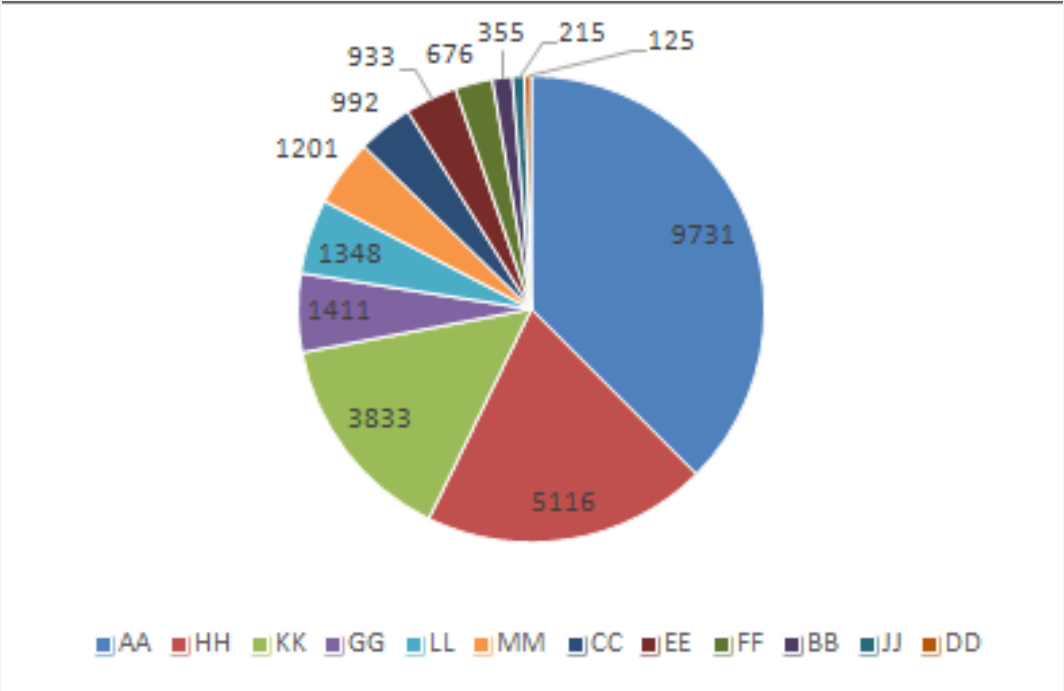
- Pie Chart / Bar Chart
- Scatter Plots
- Distribution Plots
- Box Plots
- **FacetGrid**
- Heatmap

More Advanced visualizations

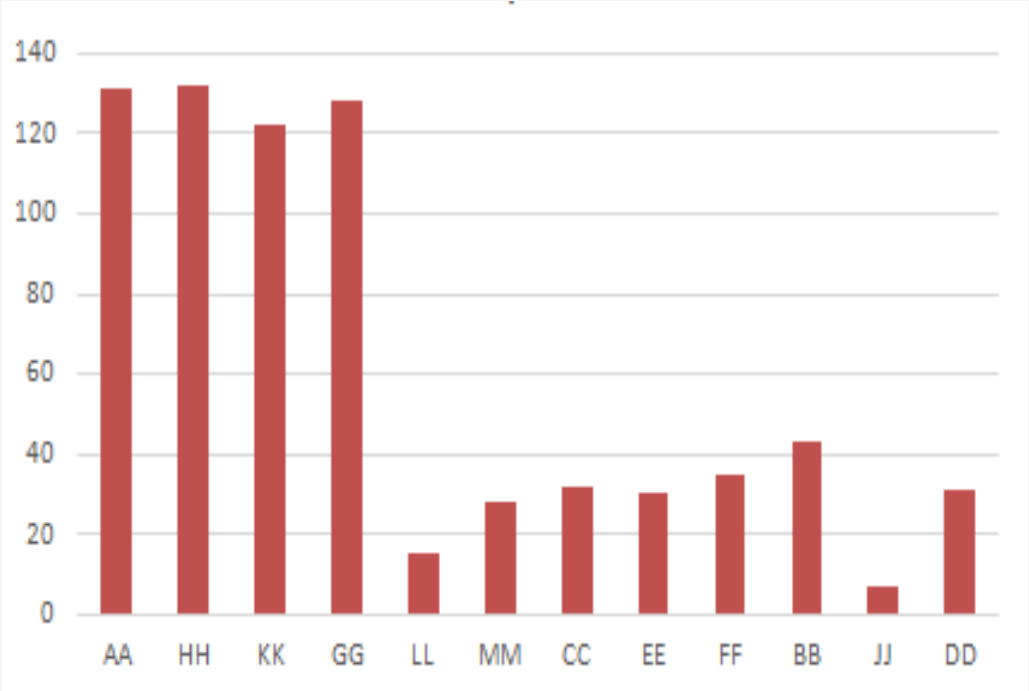
- Geographical Maps (KML)
- Interactive Plots
- Dash
- D3
- 3D plots
- **Folium**

Basic Business Data Visualization

Revenue by Products

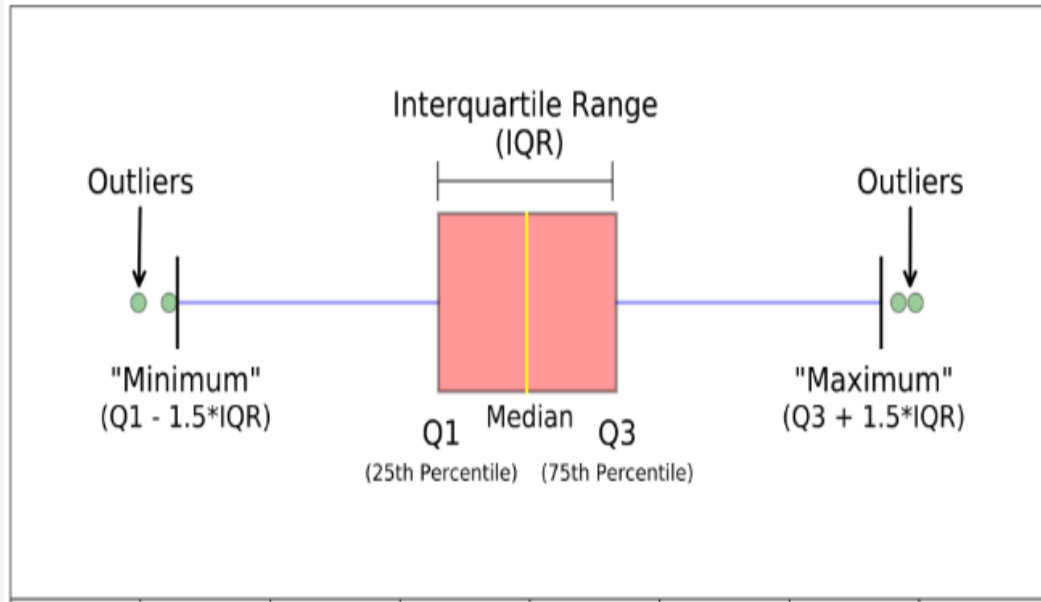


Orders by Products

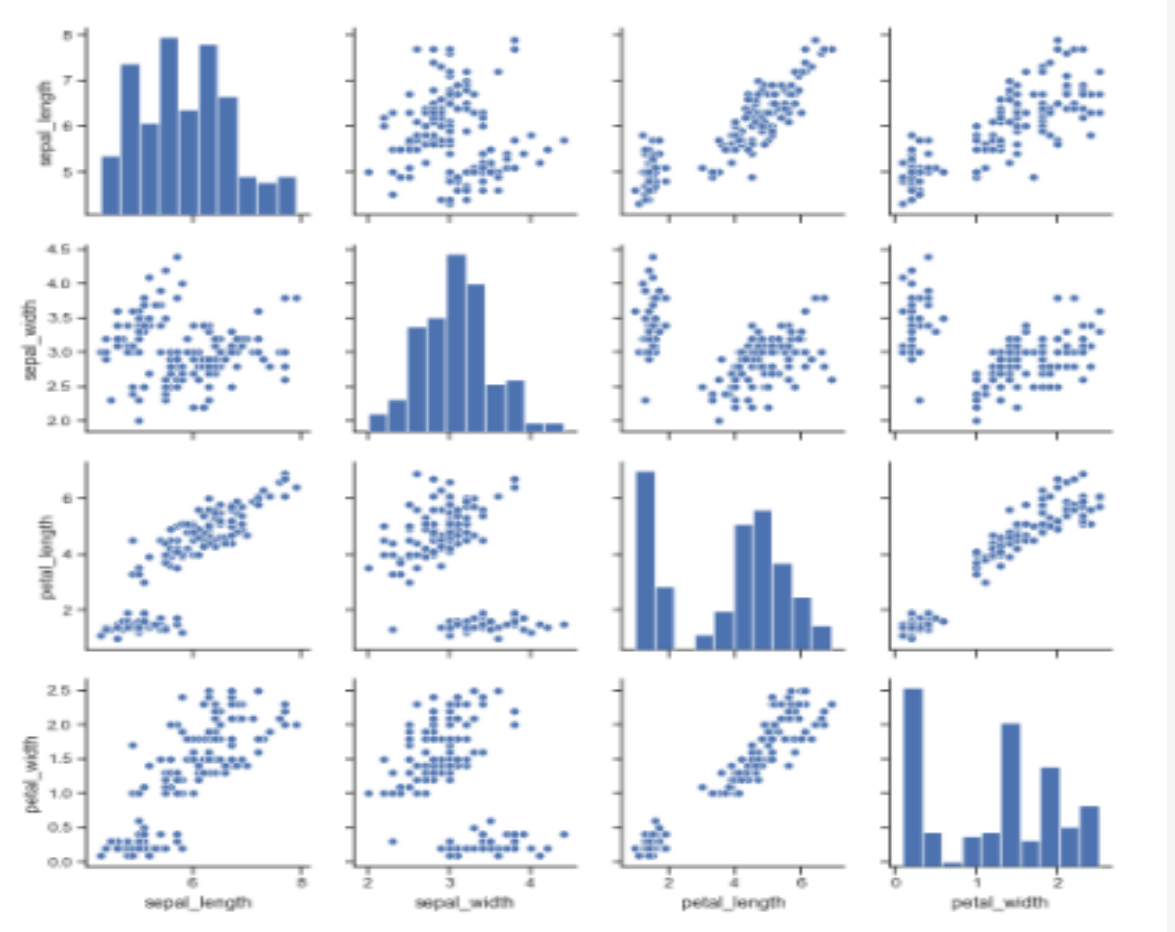


Common Plot type

Box Plot



Pairs Plot



Common Plot type

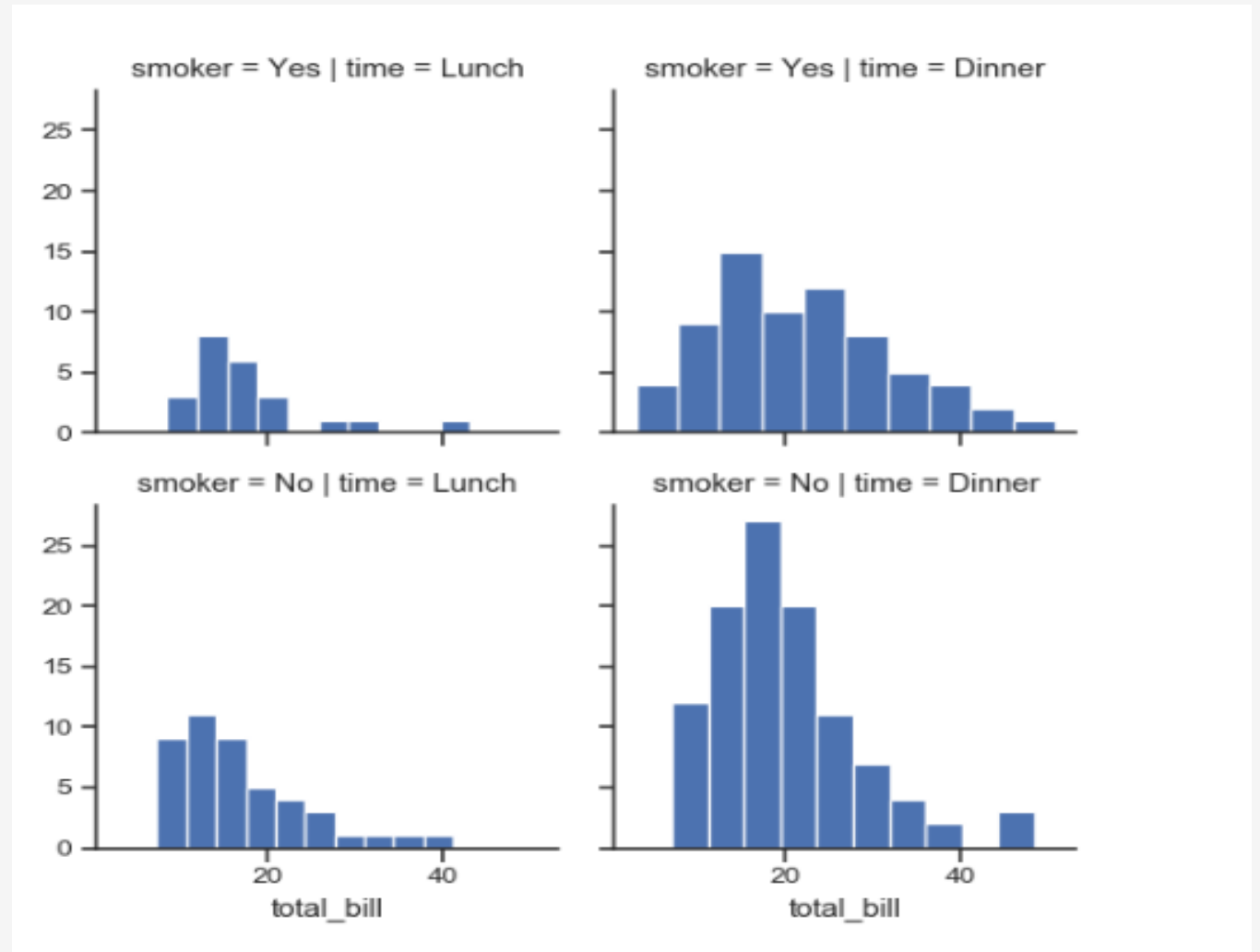
FacetGrid

Tips data set

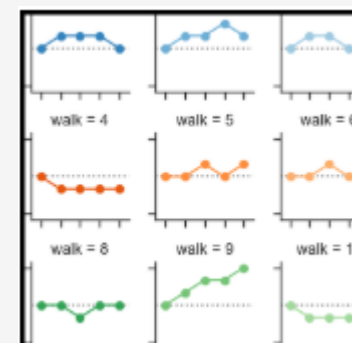
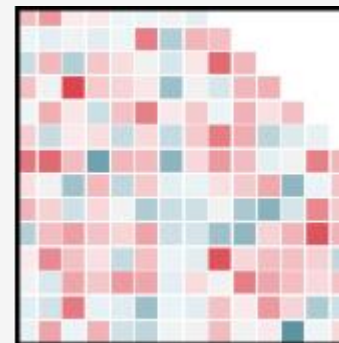
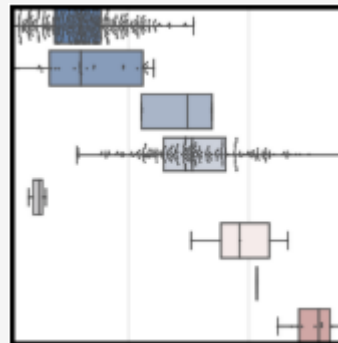
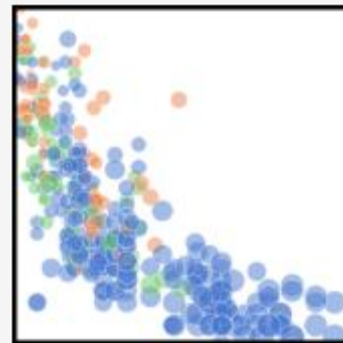
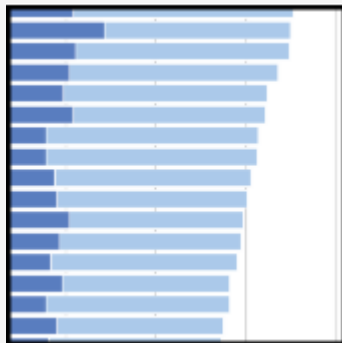
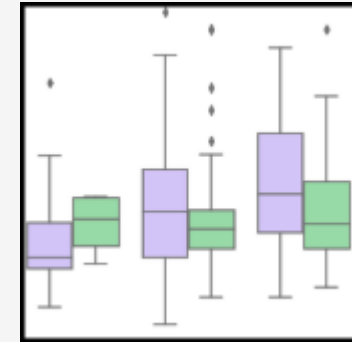
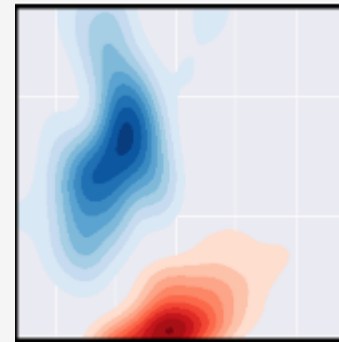
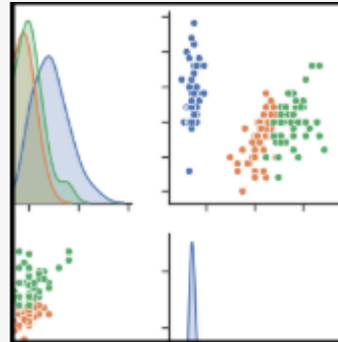
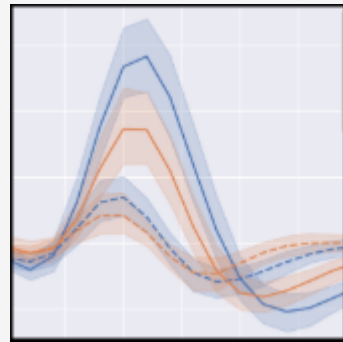
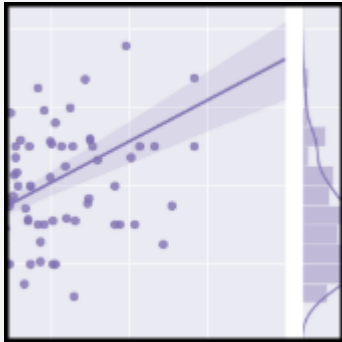
Total_bill

Smoker = Yes or No

Time = Dinner or Lunch



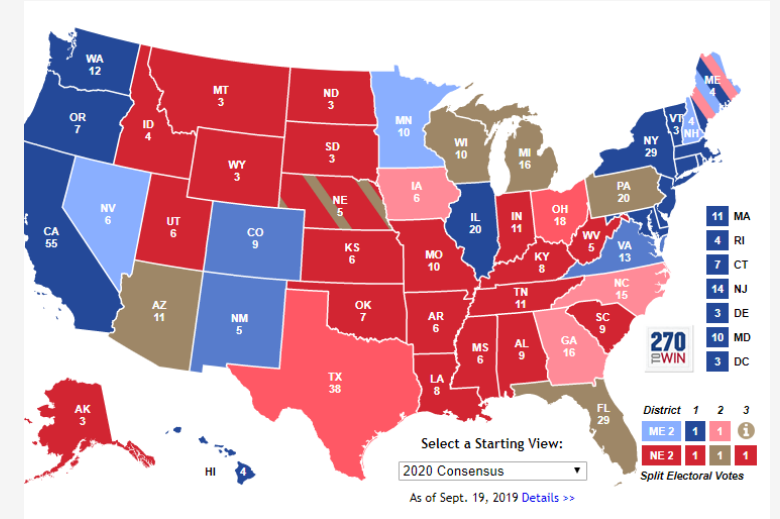
More advanced Types of Visualizations



More advanced Types of Visualizations

Geographical Data Visualizations

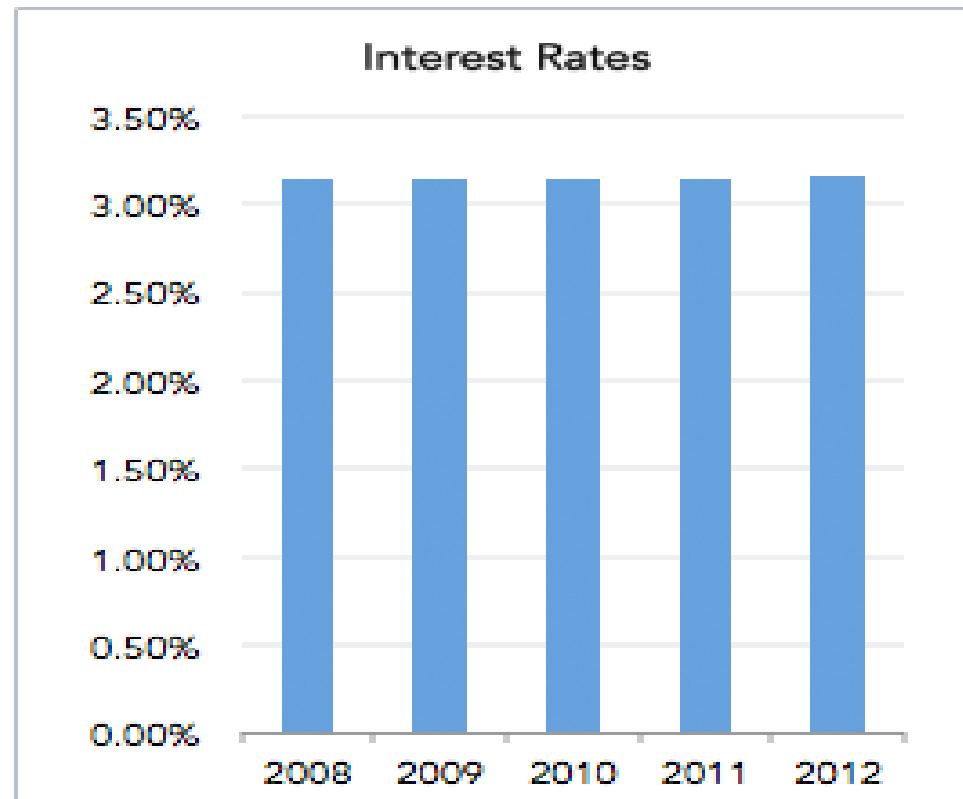
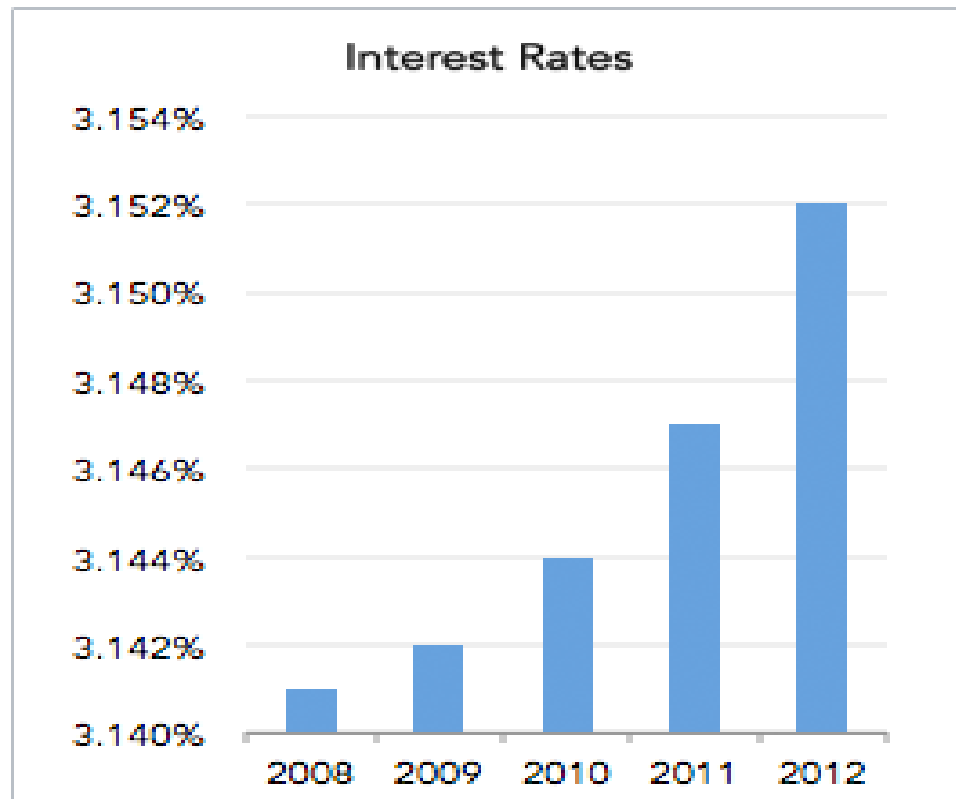
- Google Map
- Folium Python library (pip install folium)
<https://python-visualization.github.io/folium/quickstart.html>
- KML (pip install simplekml)
<https://pypi.org/project/simplekml/>
- Google Earth
<https://www.google.com/earth/versions/#earth-pro>



How to misuse or even lie Data Visualization

Mess around with your scale in the axis

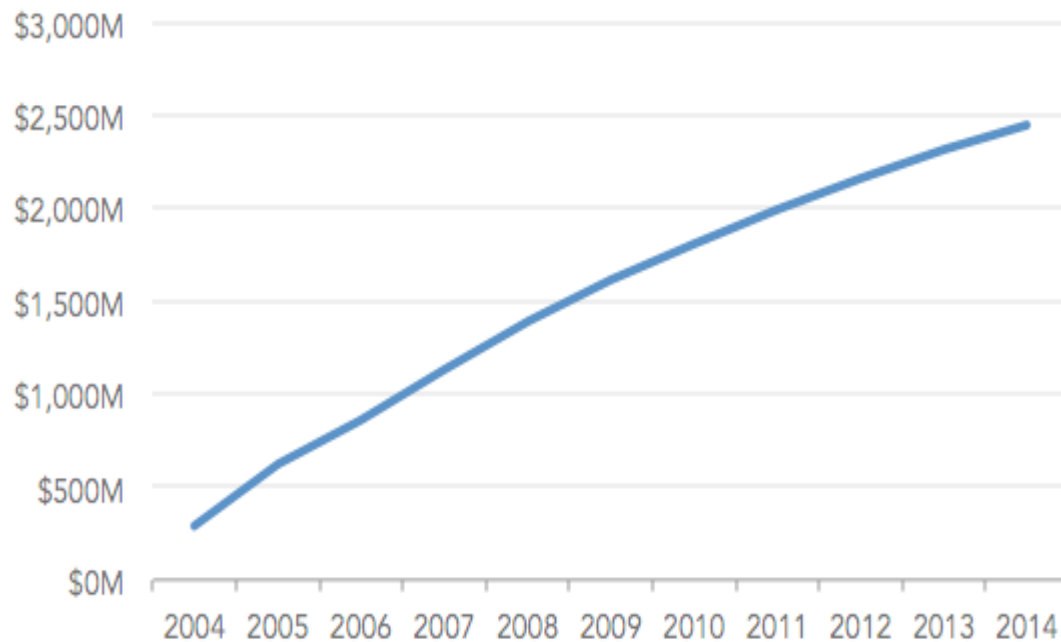
Same Data, Different Y-Axis



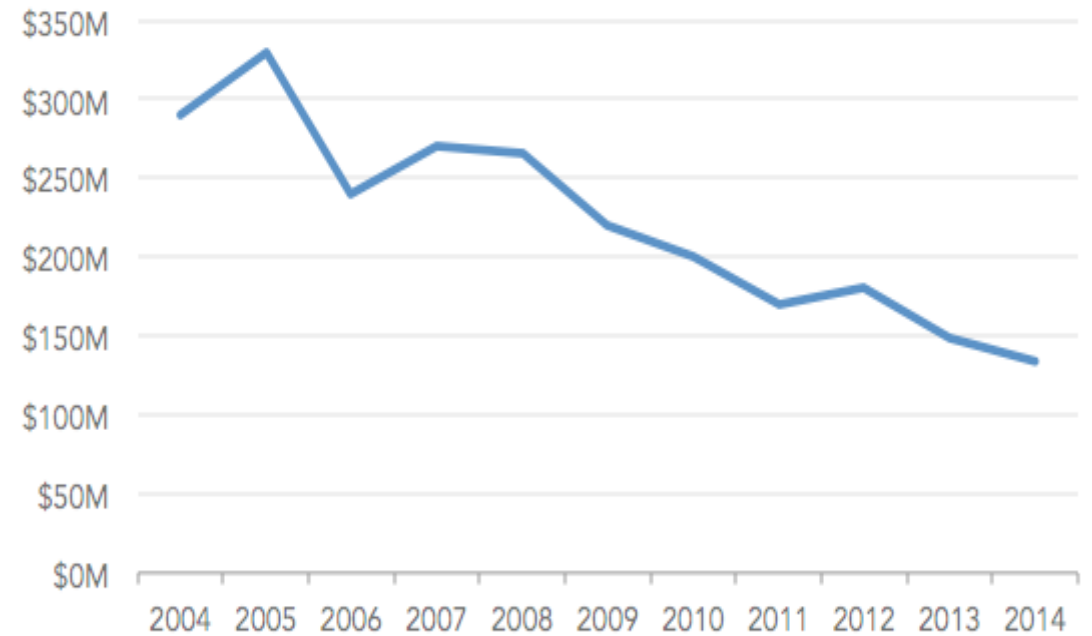
How to misuse or even lie with Data Visualization

Use Cumulative graph

Cumulative Annual Revenue

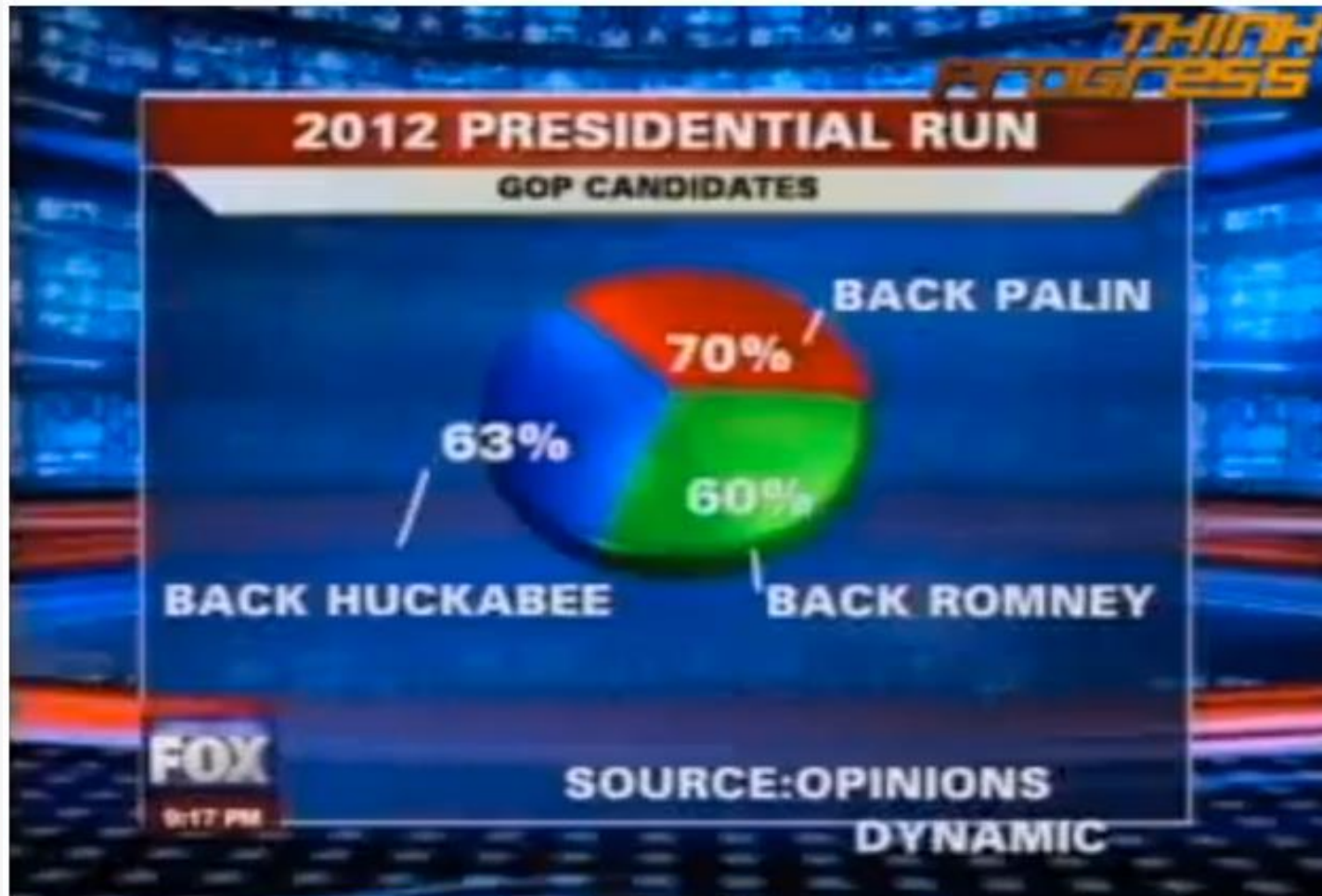


Annual Revenue



How to misuse or even lie with Data Visualization

Ignore convention



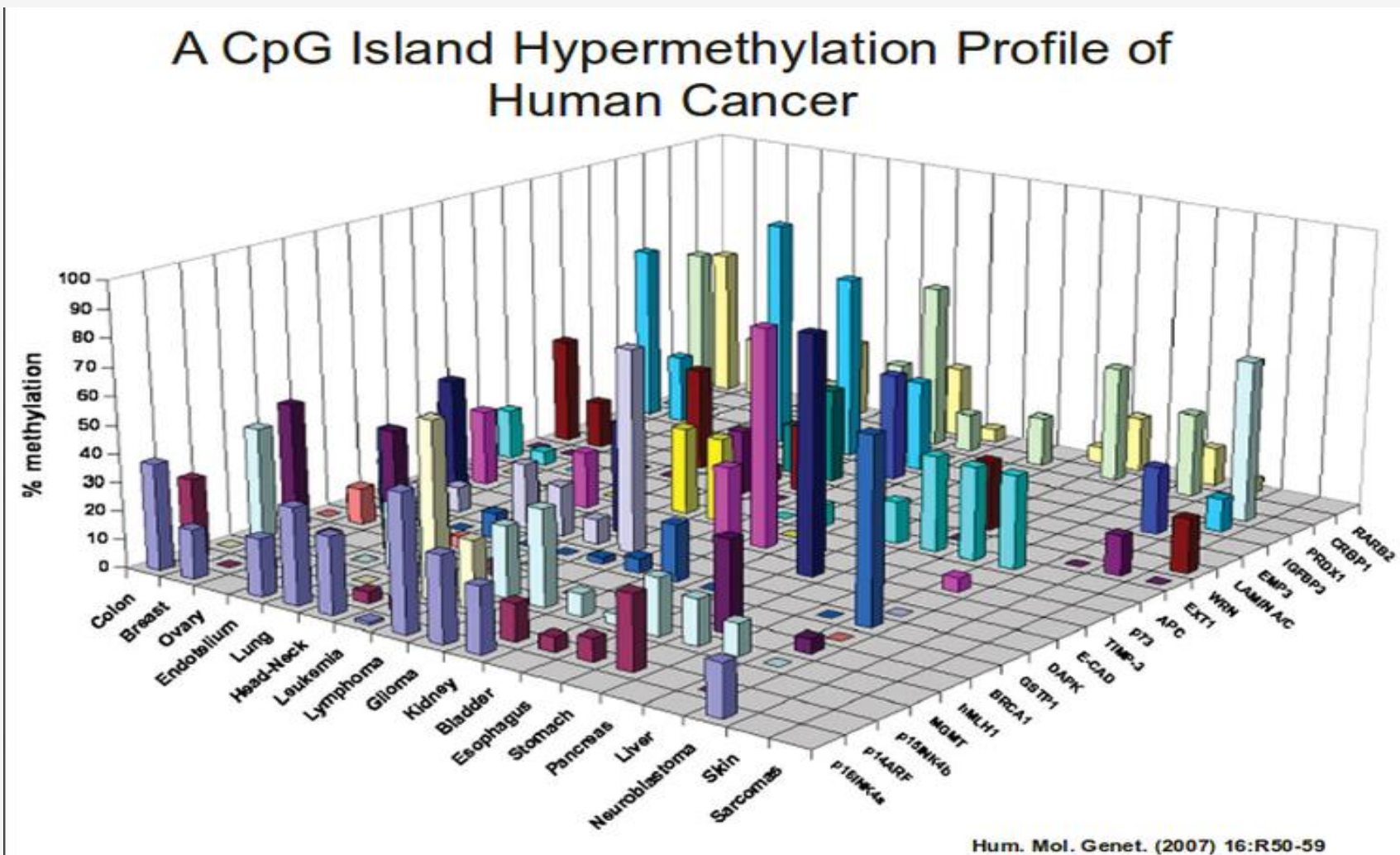
Bad way to tell a story from Data Visualization

Criteria for a bad plot:

Take more than 10 min
to understand and get
the takeaway from the
plot

Storytelling with Data

<https://www.amazon.com/Storytelling-Data-Visualization-Business-Professionals-ebook/dp/B016DHQSM2>



Hum. Mol. Genet. (2007) 16:R50-59

The other extreme

Tim Cook and other Apple leaders use this clever presentation hack to make their slides memorable — and they borrowed it from Steve Jobs

When Apple CEO Tim Cook began talking about a new release of Apple's mobile operating system (iOS 13), he said: "iOS has the highest customer satisfaction in the industry, with an incredible 97%." The slide had one number in large font — 97%. In smaller font beneath the number, a sentence read: "Customer satisfaction for iOS 12." That's it. One number and one sentence.



https://www.businessinsider.com/apples-leaders-use-this-presentation-hack-to-make-slides-memorable-2019-6?utm_content=buffer5934a&utm_medium=social&utm_source=facebook.com&utm_campaign=buffer-bi

Best showcase of how to use Data Visualization

Hans Rosling: Master of Data Visualizations

TED talk on Public health and longevity

<https://www.youtube.com/watch?v=hVimVzgtD6w>

Income disparities

<https://www.youtube.com/watch?v=DoSTNRhoceY>

<https://www.youtube.com/watch?v=AdSZJzb-aX8Ed/PBS>

Accenture talk at CWRU

<http://www.youtube.com/watch?v=qprHllzhgUk> .

Data Visualizations Toolbox

Learning by doing