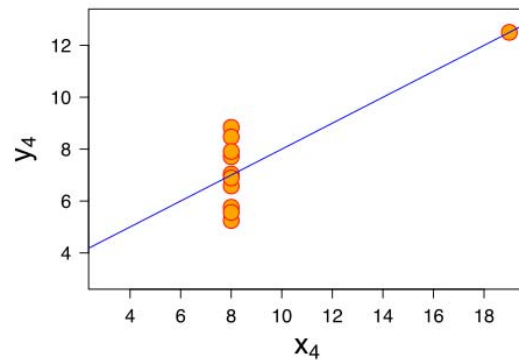
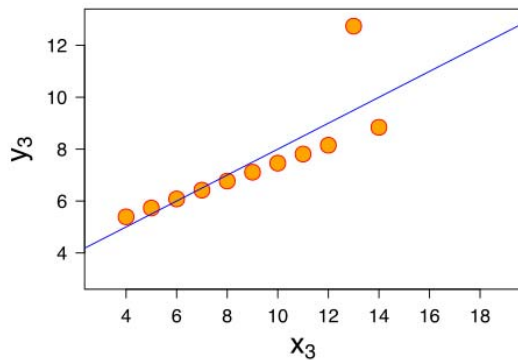
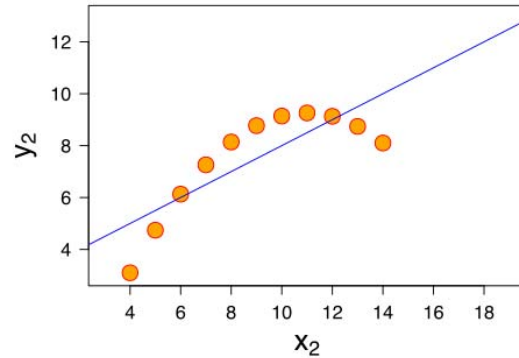
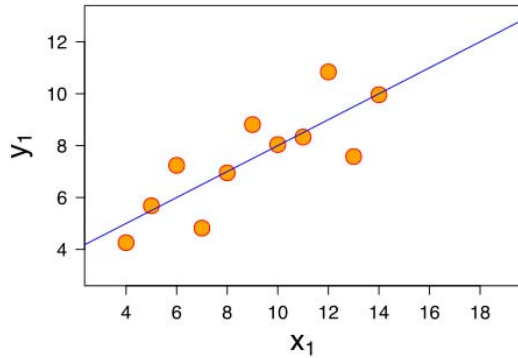


Introduction to Visualization

1. Anscombe's Quartet



Which of the data sets above matches the following summary statistics:

Property	Value
Mean of x	9
Sample variance of x	11
Mean of y	7.50
Sample variance of y	4.125
Correlation between x and y	0.816

They all match the statistics.

2. Visualization: Art and Science

Optimization algorithms can be used in engineering design to choose a particular design to solve a problem. For example, one can optimize the radius and height of a cylindrical can to minimize the amount of material used to enclose a specified volume. Why is it more difficult to make visualization design systematic?

The value to optimize is typically not obvious. What makes a visualization “good”?

3. Resource Allocation in Visualization

Human memory and attention are finite resources whose use must be considered in designing a visualization. It is often surprising how poor memory recall is. Look at the image below and then consider the image on the next page. Without looking back at the image below, what changes can you spot?



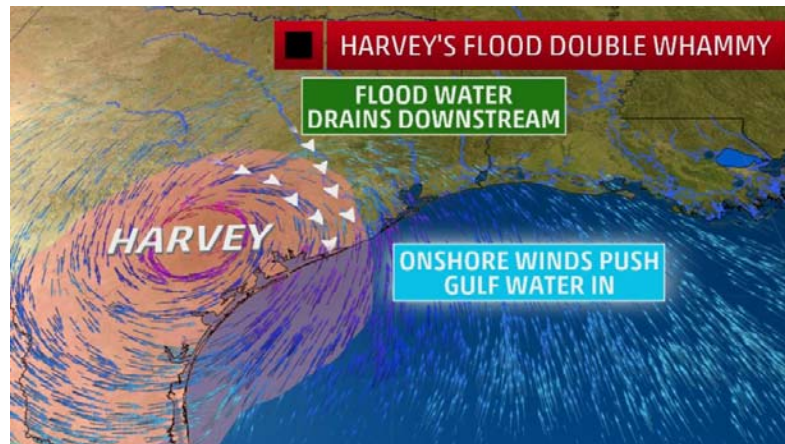


Tree branches removed, building across lake removed, people walking removed, fewer columns under the railing.

4. Types of Data

A visualization starts as data. Consider the following taxonomy (*taxonomy* means a classification scheme) and then use the terms in it to describe the data types in the following visualizations.





a. Geometry, (Vector) Field, Quantitative



b. Geometry, (Scalar) Field, Quantitative



c. Geometry, Categorical