

Welcome to Statistics

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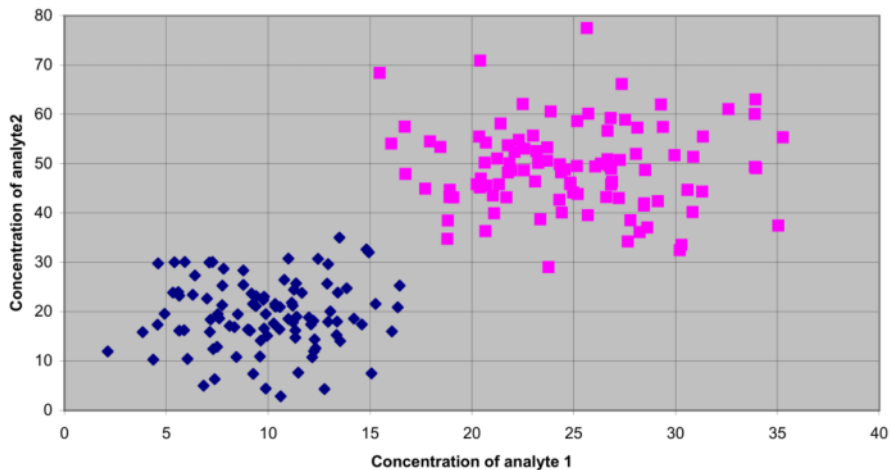
Statistics is a useful tool, not an end in itself.

“Statistics is a lively and fascinating subject, but studying it is too often excruciatingly dull.”

Wallis and Roberts, **Statistics, a New Approach**

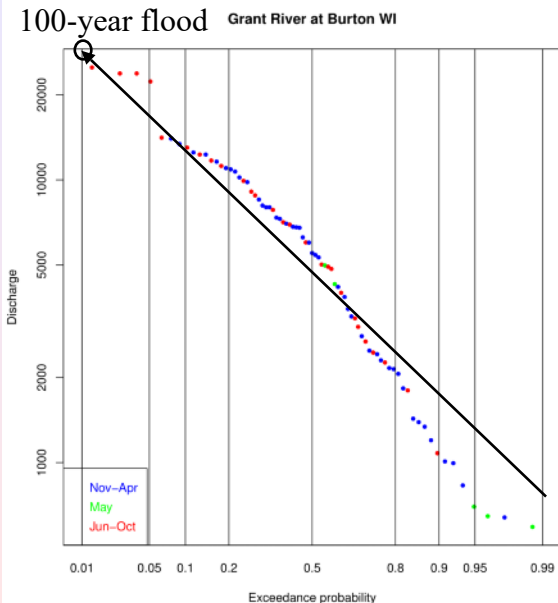
Descriptive statistics: Looking for patterns

The use of two analytes allows the separation of sources



Inferential statistics: making predictions

- Probability model
- Estimate
- Classification
- Confidence intervals
- Hypothesis testing



What do you see?



Determine what matters



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A Winning Culture Keeps Score

by John Case and Bill Fotsch | 11:00 AM December 23, 2013

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People often think of corporate culture as “soft” because it involves squishy things like values and expectations. That’s true as far as it goes—but winning cultures have a hard, metrics-driven element as well. A culture that feels upbeat and positive but doesn’t contribute to profitable growth or beating the competition is destined for the dustbin.

In sports, everyone gets that and knows what winning looks like. It’s reflected in your score, plain and simple. Sure, you track other numbers—what you might think of as key performance indicators—such as on-base percentage. The Boston Red Sox, the 2013 world champs in baseball, are known for their **sabermetrics**. But nobody in the organization thinks those stats are more important than outscoring opponents.

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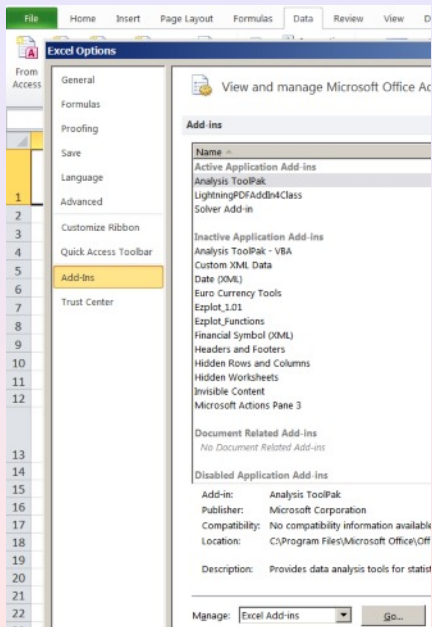
1. [How Netflix Reinvented HR](#)
2. [When You Criticize Someone, You Make It Harder for that Person to Change](#)
3. [The Eight Archetypes of Leadership](#)

Statistics gives us the tools to distinguish reality from wishful thinking



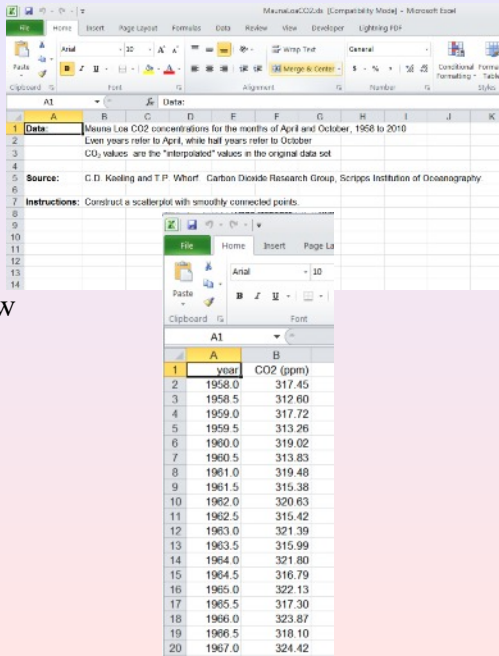
Now, the tools

- Under File → Options → Add-ins locate and load Analysis ToolPak
- A new menu item now shows up as Data with Data Analysis on the ribbon.
- We'll discuss together using this toolpak.



Putting data in Excel: Format for analysis

- Variables each in a column
- Short header on top row
- Cases/observation each in a row
- Information about data on a separate tab
- In-class exercise!



The screenshot shows a Microsoft Excel spreadsheet with the following content:

MaunaLoaCO2.xls (Compatibility Mode) - Microsoft Excel

File Home Insert Page Layout Formulas Data Review View Developer Lightning FDF

Clipboard Font Alignment Number Styles

1 Data: Mauna Loa CO2 concentrations for the months of April and October, 1958 to 2010
2 Even years refer to April, while half years refer to October
3 CO₂ values are the "interpolated" values in the original data set
4
5 Source: G.D. Keeling and T.P. Whorf, Carbon Dioxide Research Group, Scripps Institution of Oceanography
6
7 Instructions: Construct a scatterplot with smoothly connected points.
8
9
10
11
12
13
14

Zoomed-in view of the data table:

	A	B
1	year	CO ₂ (ppm)
2	1958.0	317.45
3	1958.5	312.60
4	1959.0	317.72
5	1959.5	313.26
6	1960.0	319.02
7	1960.5	313.83
8	1961.0	319.48
9	1961.5	315.38
10	1962.0	320.63
11	1962.5	315.42
12	1963.0	321.39
13	1963.5	315.99
14	1964.0	321.80
15	1964.5	316.79
16	1965.0	322.13
17	1965.5	317.30
18	1966.0	323.87
19	1966.5	318.10
20	1967.0	324.42

Old Faithful data set

1. What is the average time between eruptions?
2. What was the longest time recorded between eruptions? The shortest?
3. Create a histogram of eruptions.
4. How long does an eruption usually last?
5. How can we best predict the time to the next eruption?

