INTRO TO DATA SCIENCE
LESSON 1: WHAT IS DATA SCIENCE?

WELCOME!

Instructors: Alfred Lee, Patrick McNamara

TA: Sean Quigley

Classes:

Tuesday & Thursday, 6:30-9:30

22 East 17th St, Floor 2

Outside of classwork: Roughly 3 hours a week.

Office Hours: To Be Determined (Today!)

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I. WHAT IS DATA SCIENCE?
II. THE DATA MINING WORKFLOW

LAB:
III. COMPUTER SETUP
IV. DATA PRACTICE

I. WHAT IS DATA SCIENCE?

3 Minutes:

Use paper/your computer to write down as many different definitions/associations you know about the term 'data science'.

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5 Minutes:

In a small group of four around you, introduce yourselves! We will hand out paper for each group.

Review definitions and associations from your group and write each one down on a different piece of paper.

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In a small group of four around you, introduce yourselves!
Joe and I will hand out a memo pad for each group.
Review all definitions and associations from your group and write each one down on a different piece of memo paper.
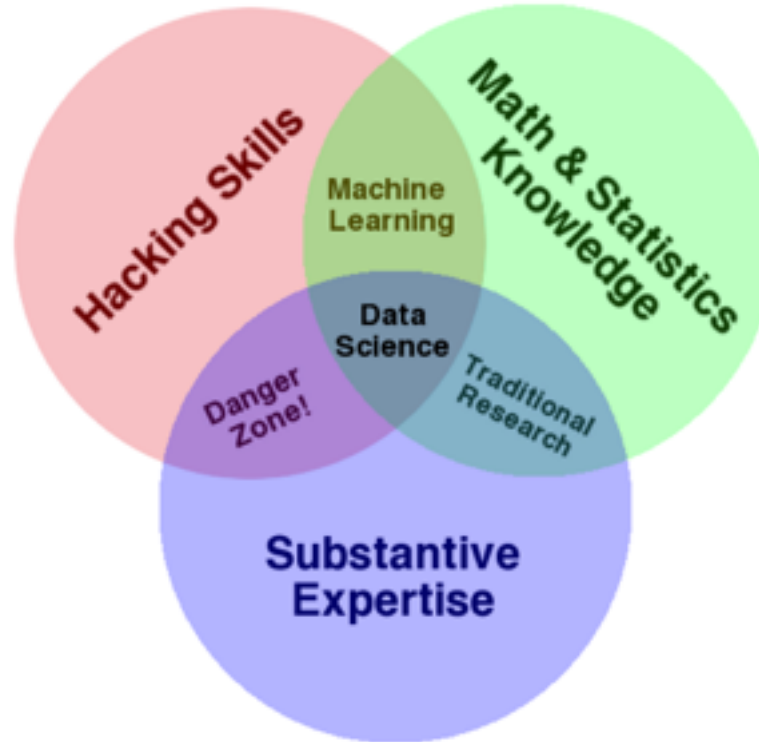
5 Minutes:

As a group, decide how to best "cluster" your definitions and associations. You can have as many different clusters as you want! Make sure you have a label for each cluster.
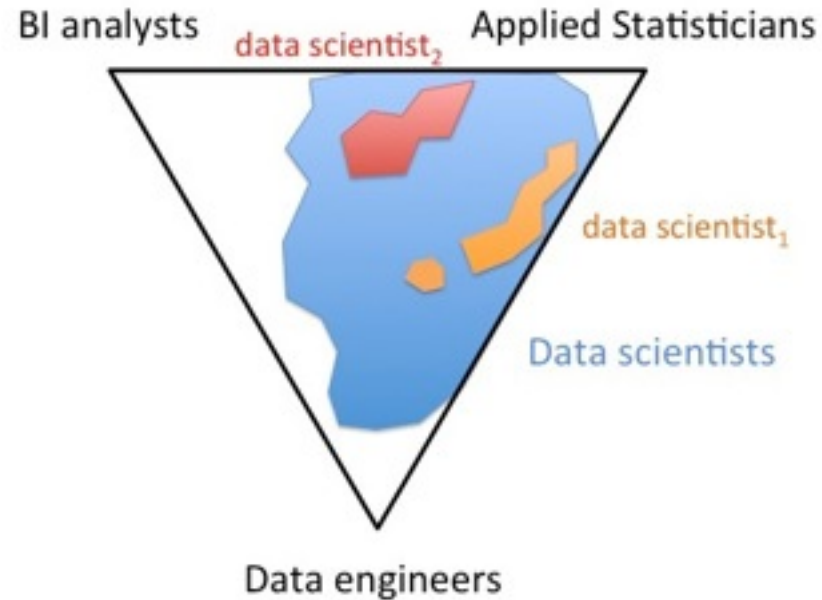
Cluster review!

A set of tools and techniques used to extract useful information from data.

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An interdisciplinary, problem-oriented subject.

source: http://www.dataists.com/2010/09/the-data-science-venn-diagram/

source: http://www.p-value.info/2012/12/what-is-data-scientist.html

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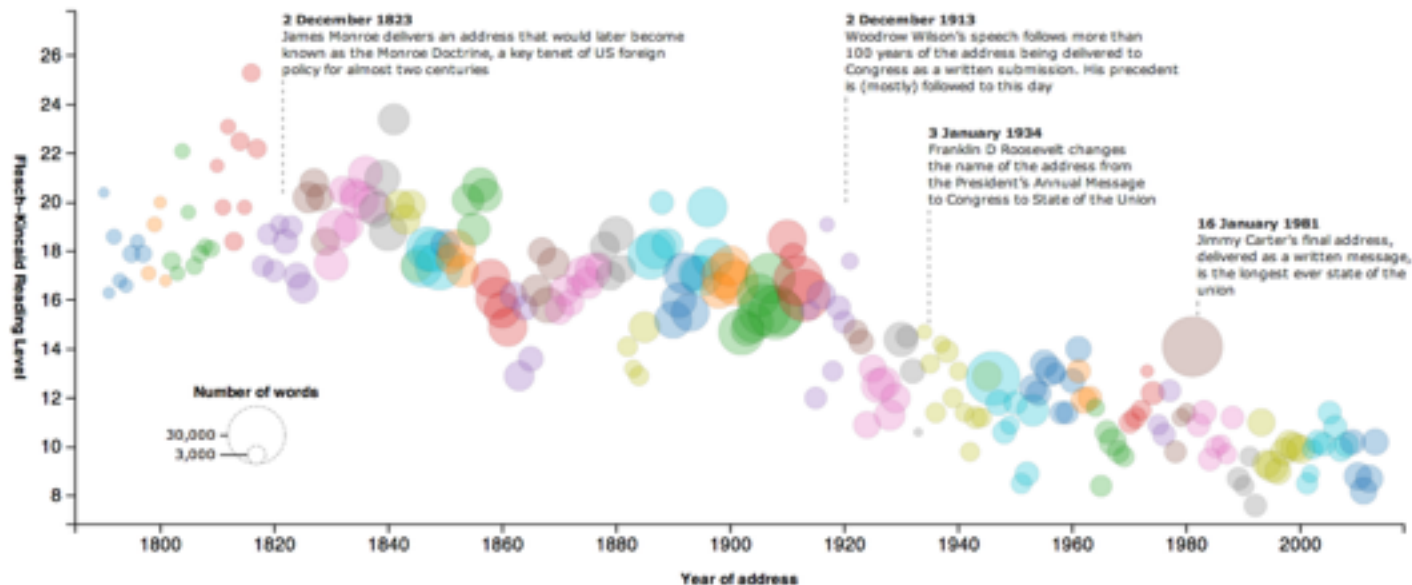
A rapidly growing field.

The state of our union is ... dumber:
How the linguistic standard of the presidential address has declined

Using the Flesch-Kincaid readability test the Guardian has tracked the reading level of every state of the union

Music + Data:
http://bit.ly/echonest

"'Data Scientist' is a Data Analyst who lives in California"

"A data scientist is someone who is better at statistics than any software engineer and better at software engineering than any statistician."

"A data scientist is a business analyst who lives in New York."

"A data scientist is a statistician who lives in San Francisco."

"Data Science is statistics on a Mac."

source: http://www.youtube.com/watch?v=h9vQIPfe2uU

Michael E. Driscoll
@medriscoll

Following

Data scientists: better statisticians than most programmers & better programmers than most statisticians bit.ly/NHmRqu @peteskomoroch

← Reply   ⇄ Retweet   ★ Favorite   ••• More   ▼ Pocket

- Statistical and machine learning knowledge

- Computer Science and Engineering experience

- Academic curiosity

- Product sense

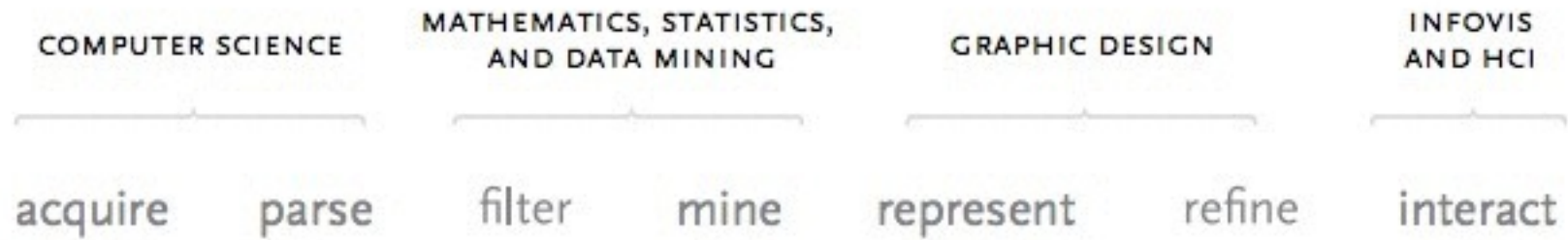- Storytelling and communication skills

II. THE DATA SCIENCE WORKFLOW

Dataists blog

1. Obtain

2. Scrub

3. Explore

4. Model

5. Interpret

source: http://berkeleydatascience.files.wordpress.com/2012/01/20120117berkeley1.pdf

Jeff Hammerbacher: Chief Scientist, Cloudera

1. Identify problem
2. Instrument data sources
3. Collect data
4. Prepare data (integrate, transform, clean, impute, filter, aggregate)
5. Build model
6. Evaluate model
7. Communicate results

Ben Fry: Principal, Fathom

COMPUTER SCIENCE		MATHEMATICS, STATISTICS, AND DATA MINING		GRAPHIC DESIGN		INFOVIS AND HCI
acquire	parse	filter	mine	represent	refine	interact

source: http://benfry.com/phd/dissertation-110323c.pdf

acquire — parse — filter — mine — represent — refine — interact

source: http://benfry.com/phd/dissertation-110323c.pdf

Zip Decode
http://benfry.com/zipdecode/

source: Phillip Guo - BLOG@CACM Data Science Workflow: Overview and Challenge
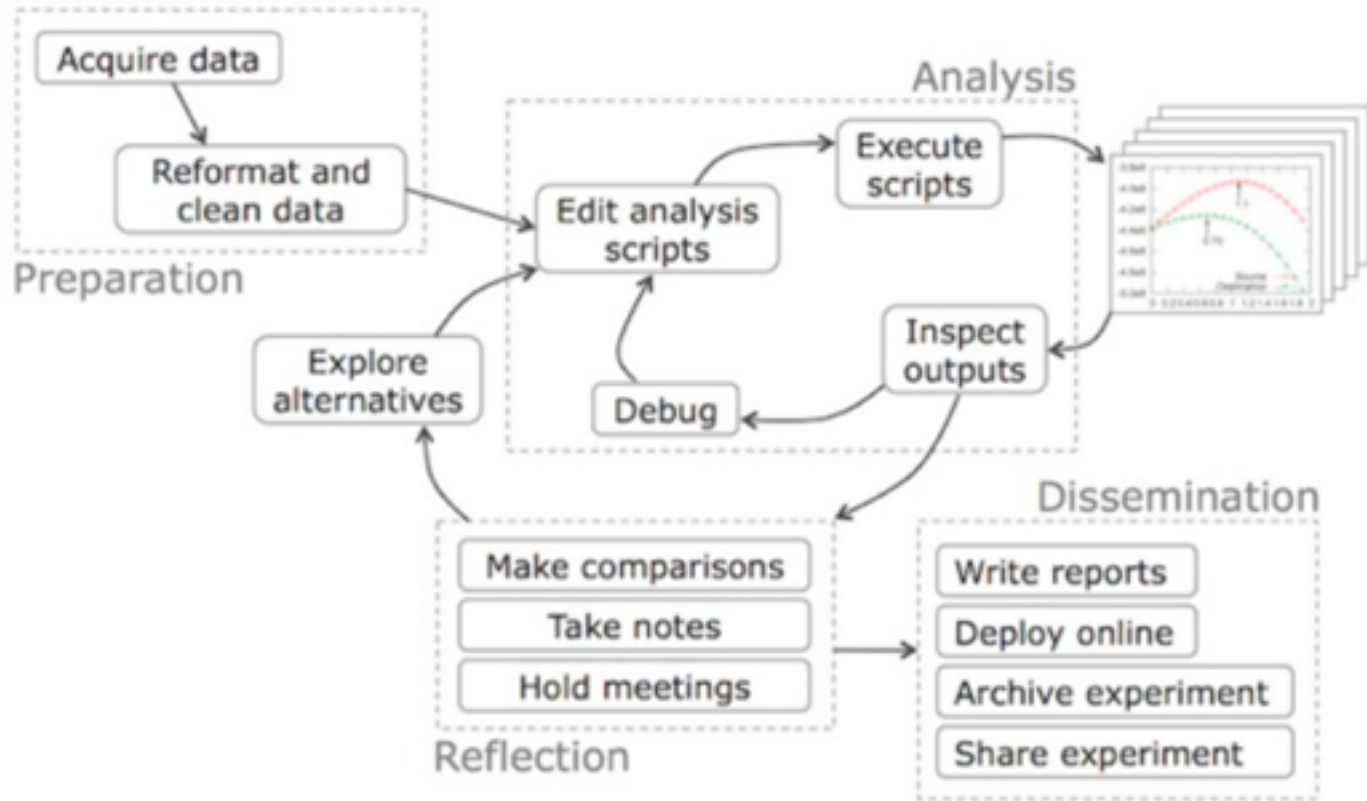
BUILDING AN ANALYTICS TEAM

1. Define the top priorities of the organization
2. Determine the data you'd like to collect

What will your greatest challenges be?
What products could you build?
What studies could you run?
How would these influence the organization?

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4. Extract new meaning to predict if user would purchase again
5. Share results (and probably also go back to the drawing board)

PROBLEM: HOW TO DEFINE "MORE ITEMS TO CONSIDER" IN AMAZON?

10 Minutes: In the same small group, define the flow an Amazon Data Scientist would work through to curate the "More items to consider" list for a particular user.

III. COMPUTER SETUP

LAB. DATA WORKFLOW

DISCUSSION