GENERAL ASSEMBLY

DATA SCIENCE
INTRO TO DATA SCIENCE

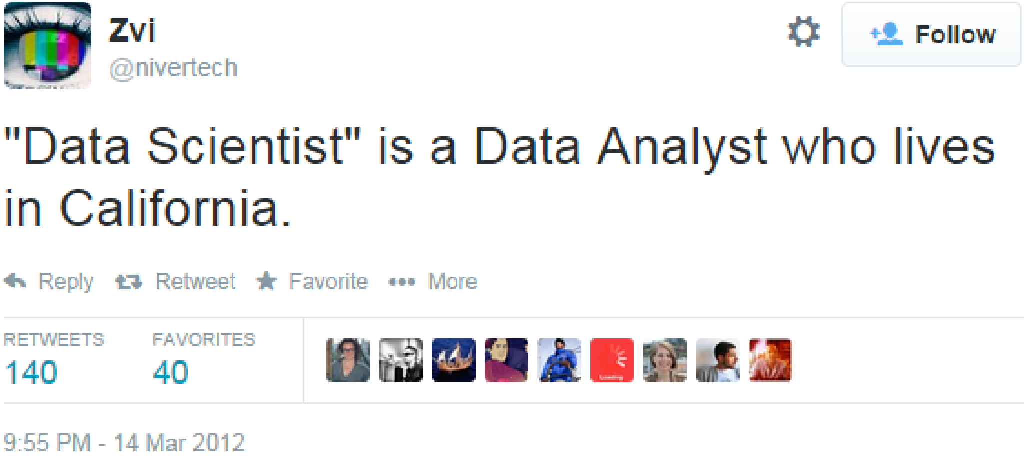
AGENDA

I. WHAT IS A DATA SCIENTIST?

II. DATA SCIENCE WORKFLOW

I. WHAT IS A DATA SCIENTIST?

WHAT IS A DATA SCIENTIST?



Zvi
@nivertech

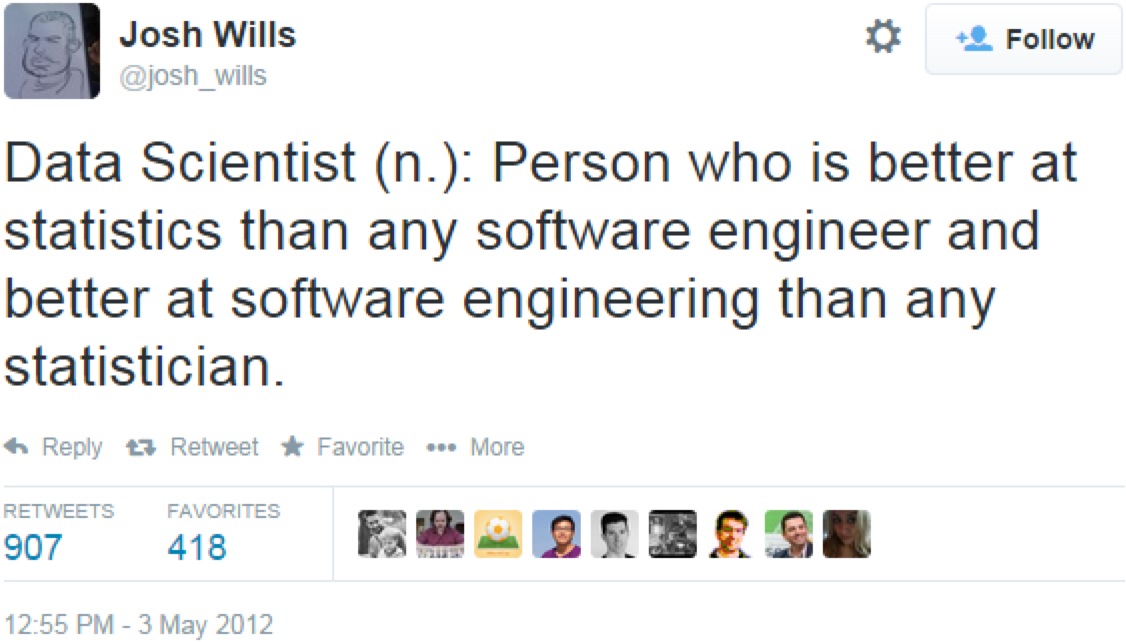
"Data Scientist" is a Data Analyst who lives in California.

RETWEETS 140

FAVORITES 40

9:55 PM - 14 Mar 2012

WHAT IS A DATA SCIENTIST?



Josh Wills
@josh_wills

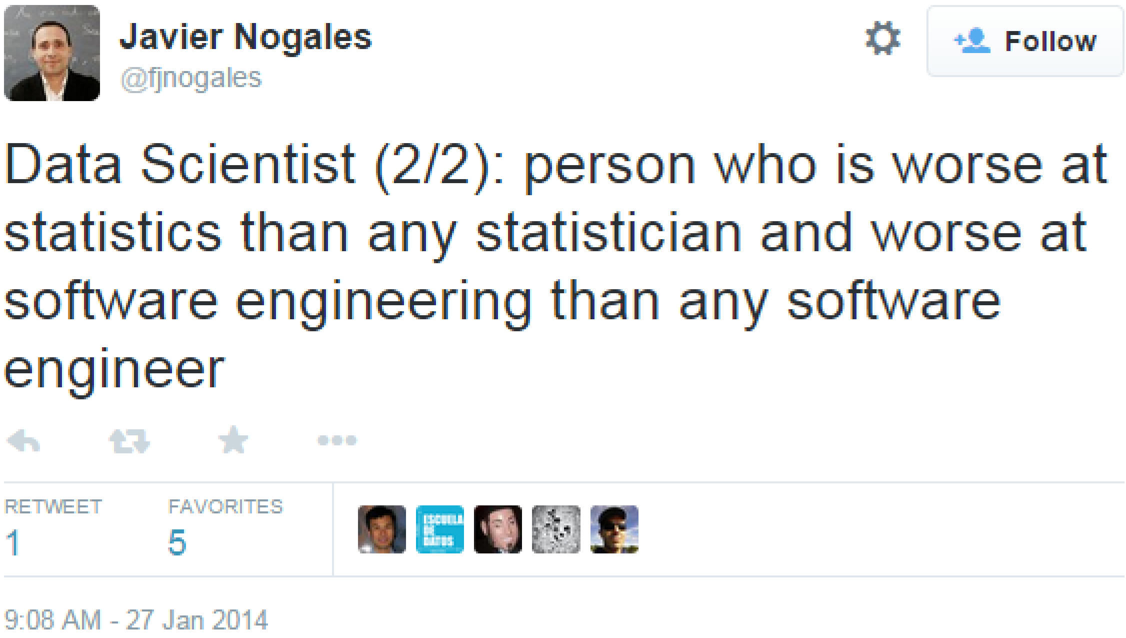
Data Scientist (n.): Person who is better at statistics than any software engineer and better at software engineering than any statistician.

RETWEETS 907

FAVORITES 418

12:55 PM - 3 May 2012

WHAT IS A DATA SCIENTIST?



Javier Nogales
@fjnogales

Data Scientist (2/2): person who is worse at statistics than any statistician and worse at software engineering than any software engineer

RETWEET 1

FAVORITES 5

9:08 AM - 27 Jan 2014

WHAT IS YOUR DEFINITION?

WHAT IS A DATA SCIENTIST?

“Data Scientists are people with some mix of **coding and statistical skills** who work on **making data useful** in various ways.”

Data Scientist Type A (for Analysis):

- Primarily concerned with **making sense of data** or working with it in a fairly **static** way.
- Similar to a statistician, but knows all the **practical details of working with data** that aren't taught in statistics: data cleaning, dealing with large data sets, visualization, domain knowledge, etc.

Source: https://www.quora.com/What-is-data-science/answer/Michael-Hochster

WHAT IS A DATA SCIENTIST?

“Data Scientists are people with some mix of **coding and statistical skills** who work on **making data useful** in various ways.”

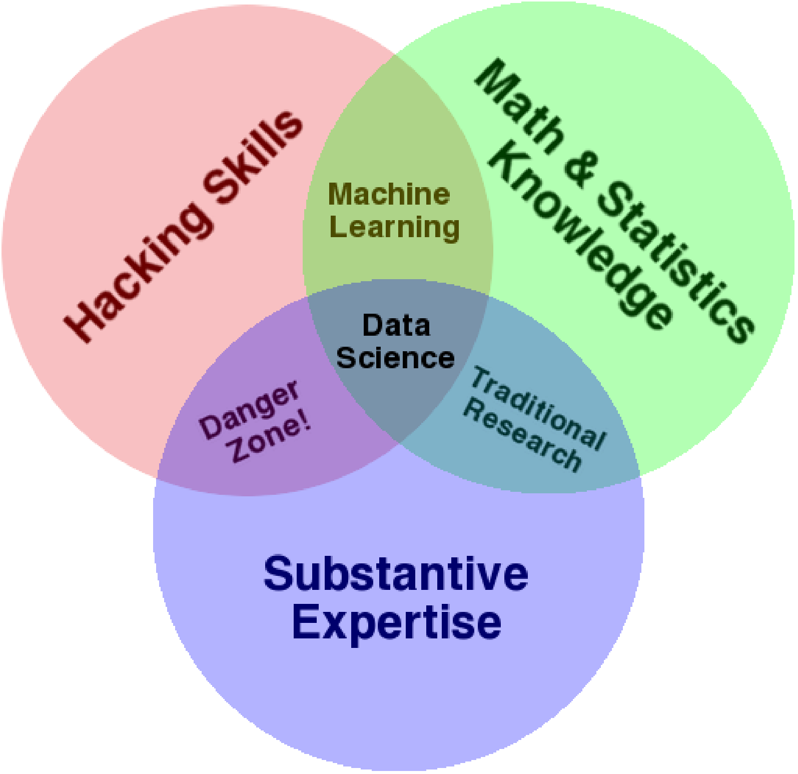
Data Scientist Type B (for Building):

- Some statistical background, but **strong coder or software engineer**.
- Primarily concerned with **using data “in production”**: building models which interact with users (by giving recommendations, for example).

Our course is focused primarily on **Type A**.

Source: https://www.quora.com/What-is-data-science/answer/Michael-Hochster

WHAT IS A DATA SCIENTIST?

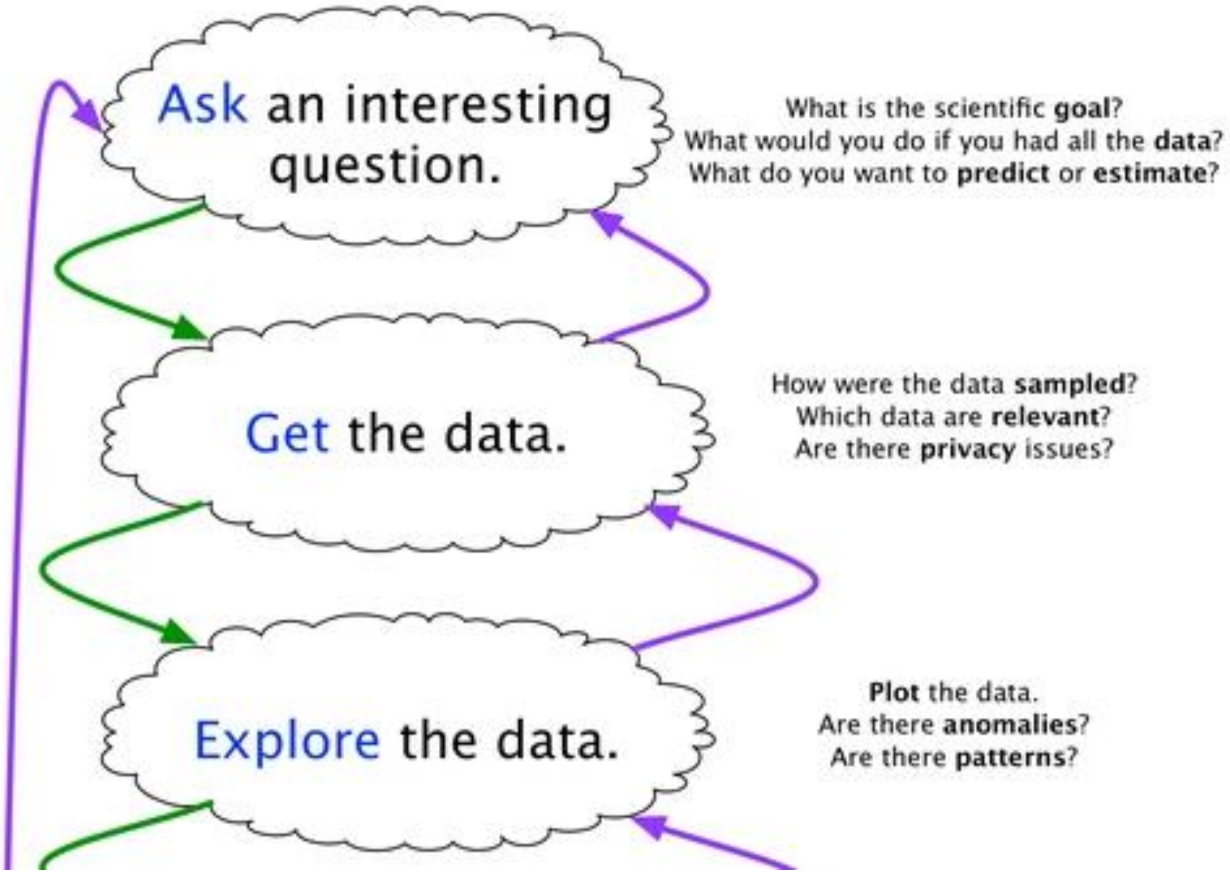


Wide variance in terms of skillsets: many job descriptions are more appropriate for a **team of data scientists!**

Source: http://drewconway.com/zia/2013/3/26/the-data-science-venn-diagram

II. DATA SCIENCE WORKFLOW

THE DATA SCIENCE WORKFLOW



Ask an interesting question.

What is the scientific **goal**?
What would you do if you had all the **data**?
What do you want to **predict** or **estimate**?

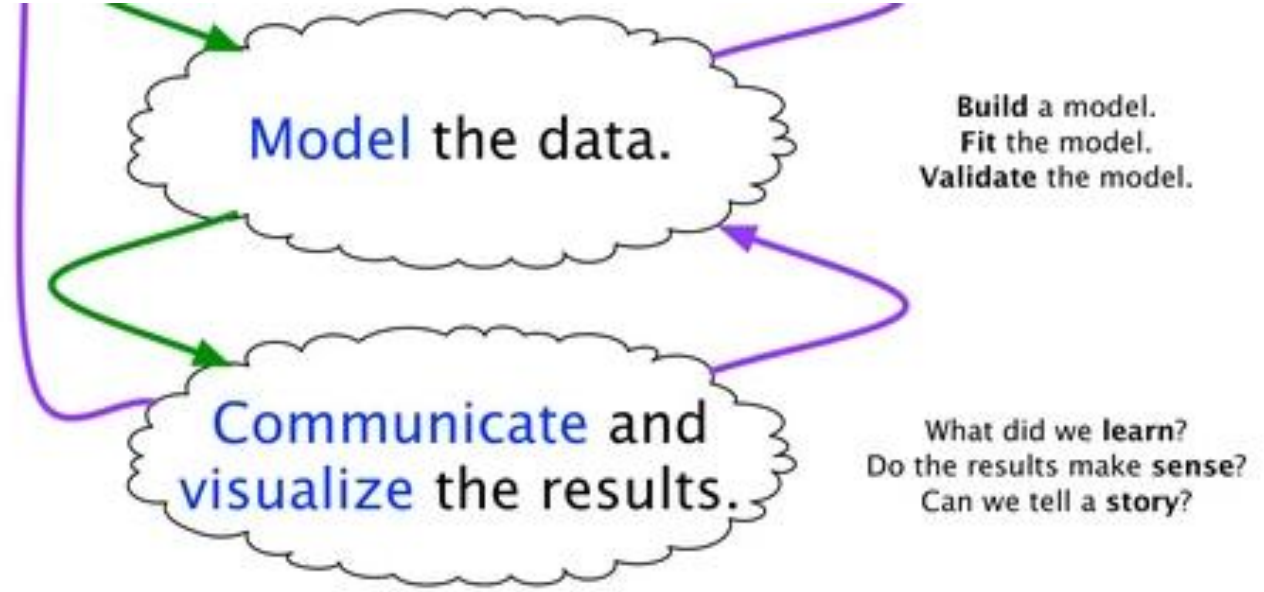
Get the data.

How were the data **sampled**?
Which data are **relevant**?
Are there **privacy** issues?

Explore the data.

Plot the data.
Are there **anomalies**?
Are there **patterns**?

THE DATA SCIENCE WORKFLOW



Model the data.

Build a model.
Fit the model.
Validate the model.

Communicate and visualize the results.

What did we **learn**?
Do the results make **sense**?
Can we tell a **story**?

Source: https://www.quora.com/What-is-the-work-flow-or-process-of-a-data-scientist-analyst-and-what-tools-do-you-use-for-this/answer/Ryan-Fox-Squire

EXAMPLE #1: PREDICTING NEONATAL INFECTION

Problem: Children born prematurely are at high risk of developing infections, many of which are not detected until after the baby is sick

Goal: Detect subtle patterns in the data that predicts infection before it occurs

Data: 16 vital signs such as heart rate, respiration rate, blood pressure, etc…

Impact: Model is able to predict the onset of infection 24 hours before the traditional symptoms of infection appear

Image: http://www.babycaretips4u.com/wp-content/uploads/2014/03/premature-baby.jpg
Case Study: http://www.amazon.com/Big-Data-Revolution-Transform-Think/dp/0544002695

EXAMPLE #2: AUTOMATING GOVERNMENT PAPER-PUSHING

Problem: Processing disability claims at the Social Security Administration is a time-intensive process, with many claims taking over 2 years to adjudicate

Goal: Automate the approval of a subset of the “simplest” disability claims

Data: Free text in the claims form

Impact: Able to fully automate 20% of the simplest claims. Rating accuracy of the algorithm is higher than the average claims examiner.

Case Study: http://dataminninglab.com/images/case-studies/ERI_Text_Mining_SSA_Claims_for_Disability_Approval.pdf