MIS 0855 Fall 2016 – Data Science

Week 1 – Introduction

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Fighting Crimes with Data (1/2)

- What does she mean by "fighting a crime is all about information?"
  - What information?
  - Specifically, what information did NYPD use to catch "Sugar"?
- What does it mean by "connecting the dots"?

http://www.tomchaveslaw.com/wrongful-arrest-civil-rights-violations/

Fighting Crimes with Data (2/2)

- What if NYPD does not have the real-time crime information? How would or should its detectives solve the crimes?
  - Would it be effective?
- Where can NYPD get information they need for crime-solving?

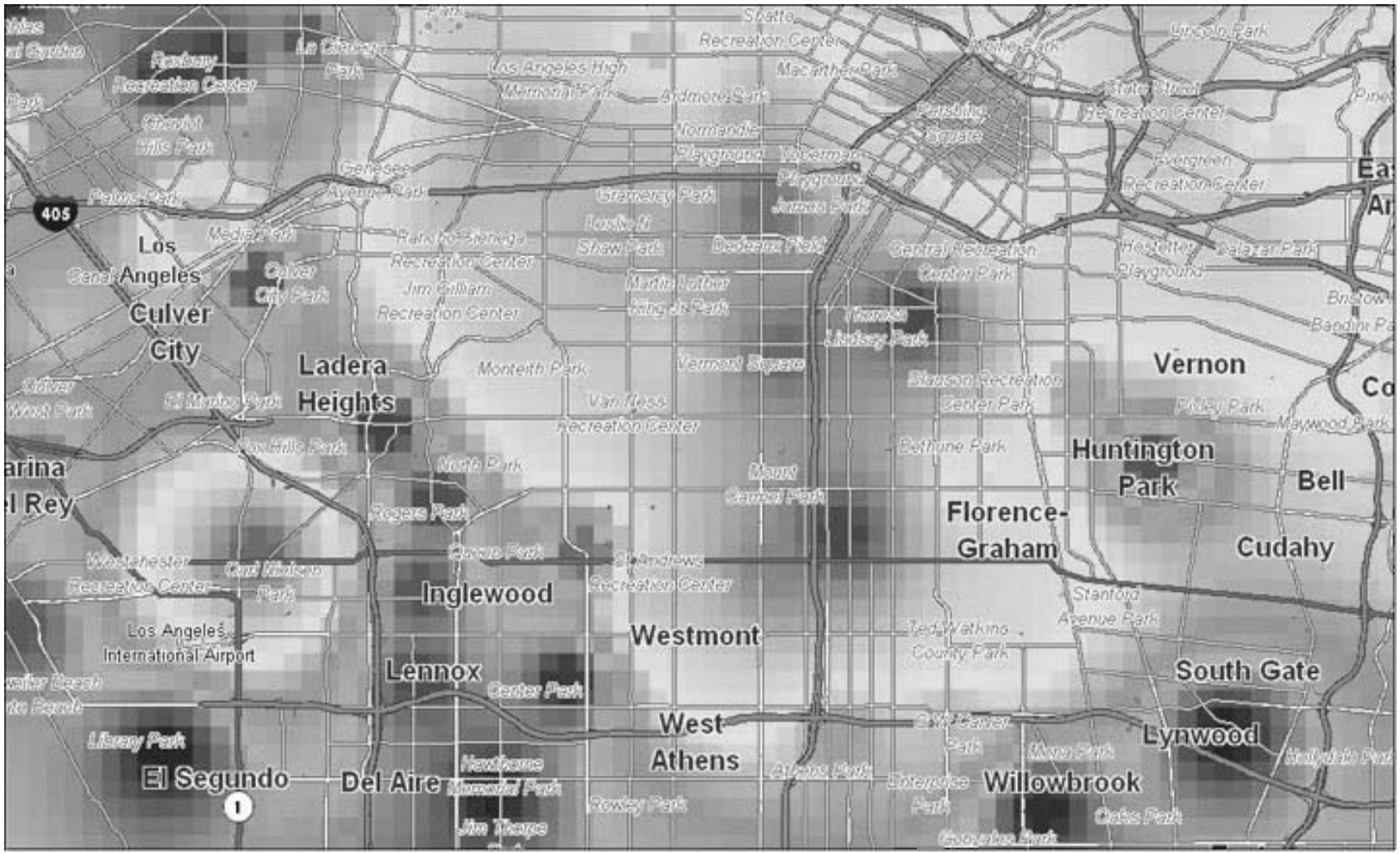
http://www.tomchaveslaw.com/wrongful-arrest-civil-rights-violations/

Why Information?

- What kind of information do we need?
- Why do we need information at all?
- Without information, what would happen?

http://www.blackcareerzone.com/
http://www.bankingsense.com/buying-a-house-5-great-tips-for-getting-a-great-deal/

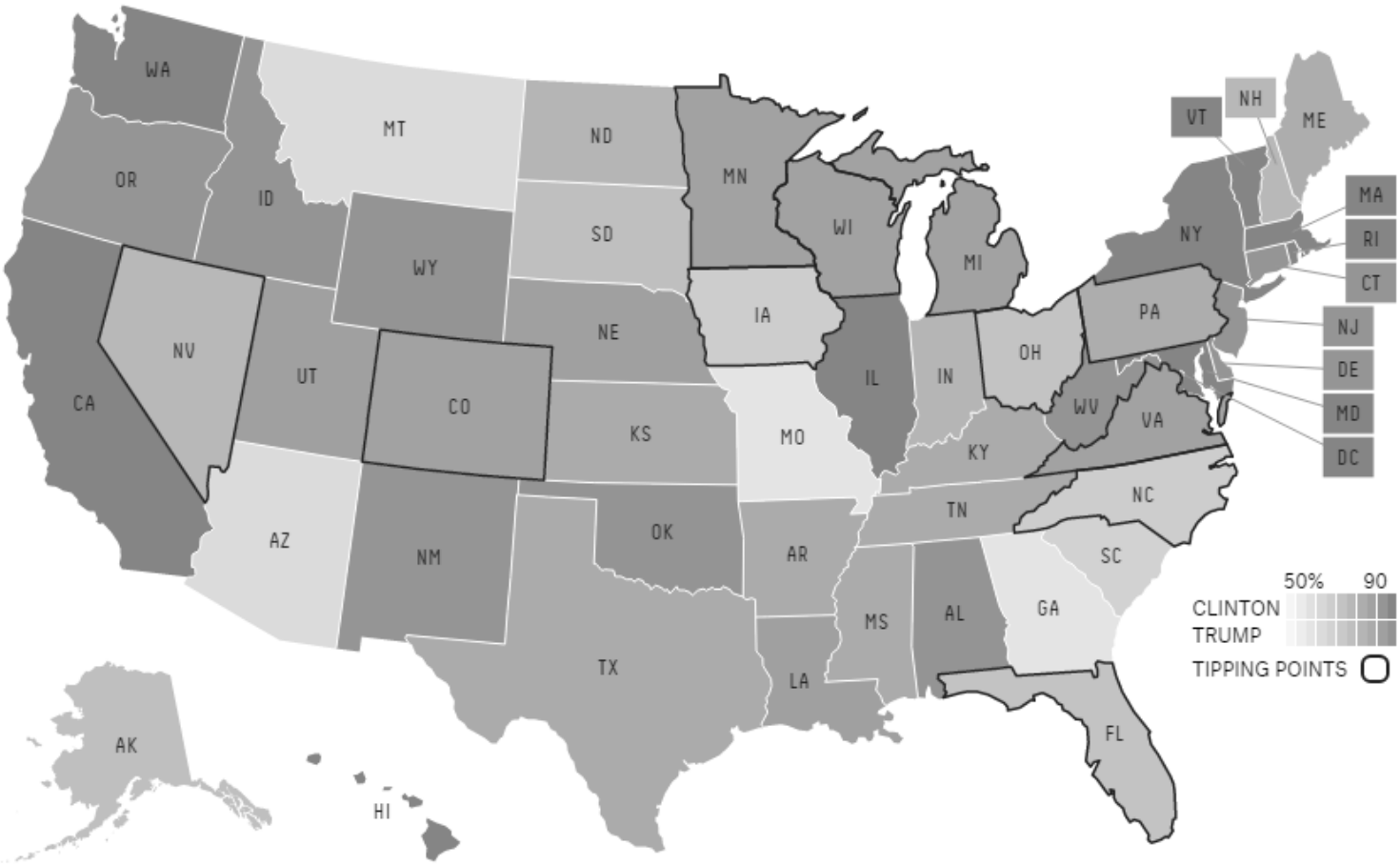
Crime Hotspots



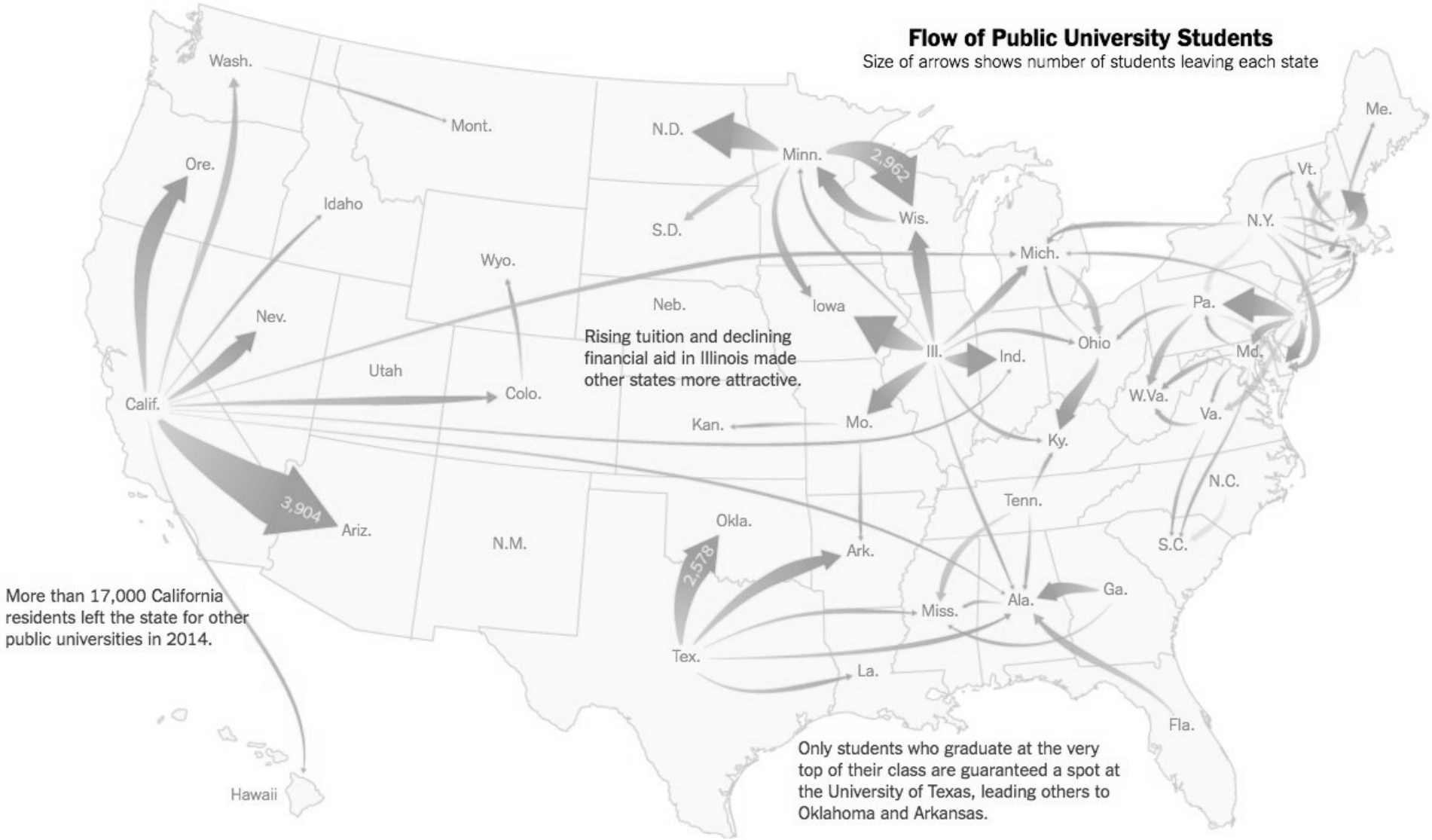
http://helper.ipam.ucla.edu/programs/chs2007/

Who will win the presidency?

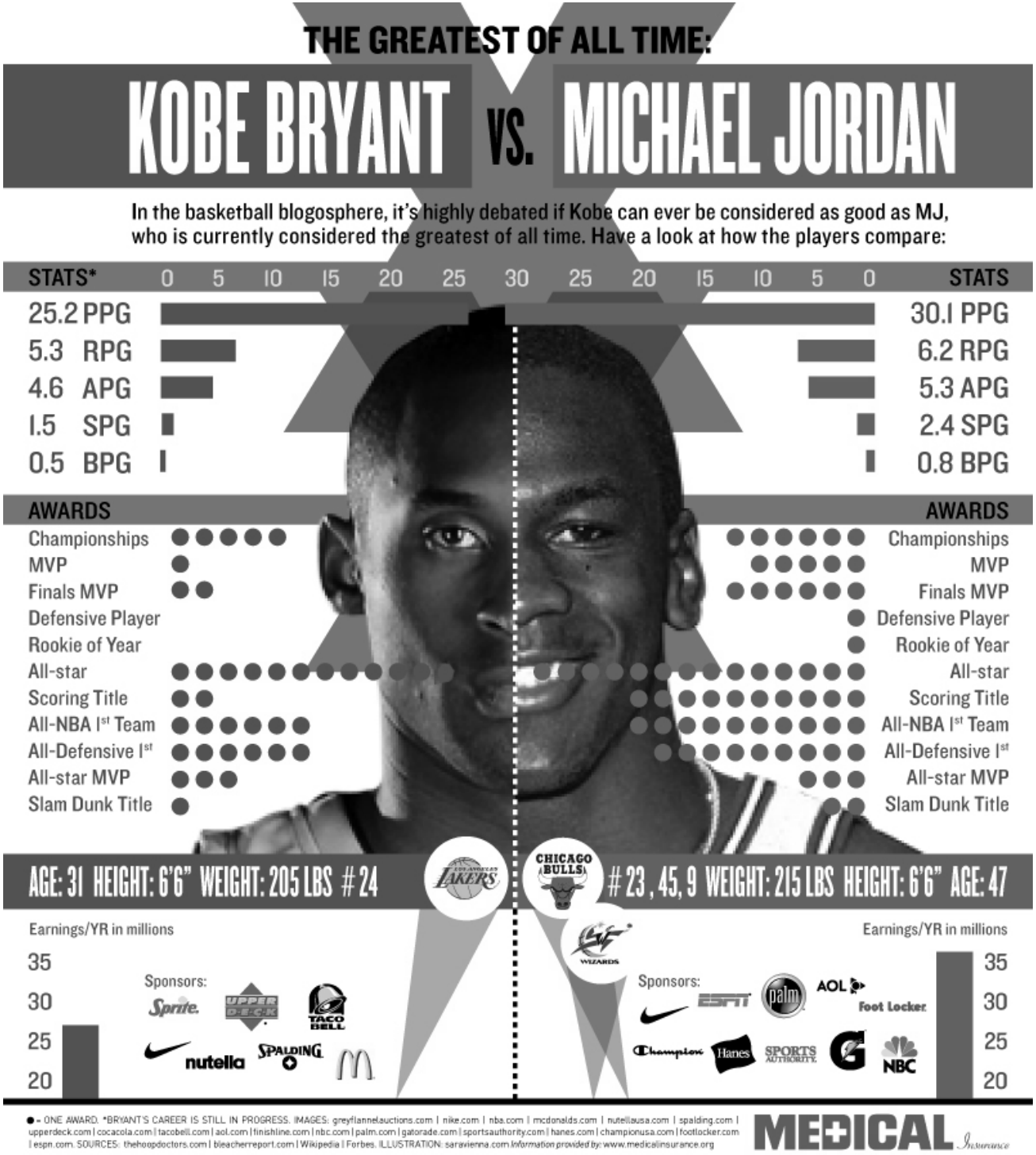
Chance of winning



http://projects.fivethirtyeight.com/2016-election-forecast/

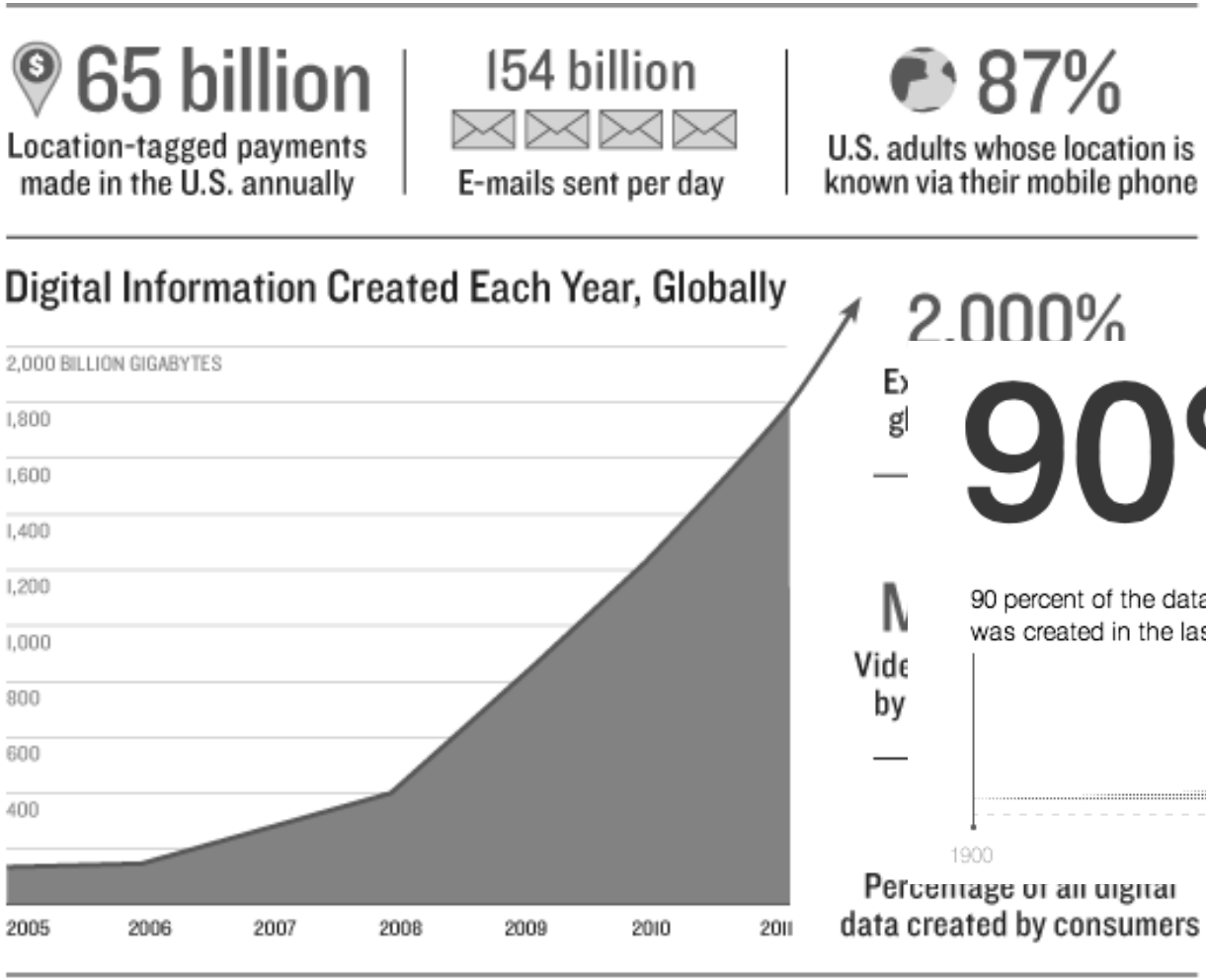


http://www.nytimes.com/interactive/2016/08/26/us/college-student-migration.html?smid=tw-share&_r=0



http://webdesignertricks.com/20-nice-sports-infographics-template/

Data is Exploding!



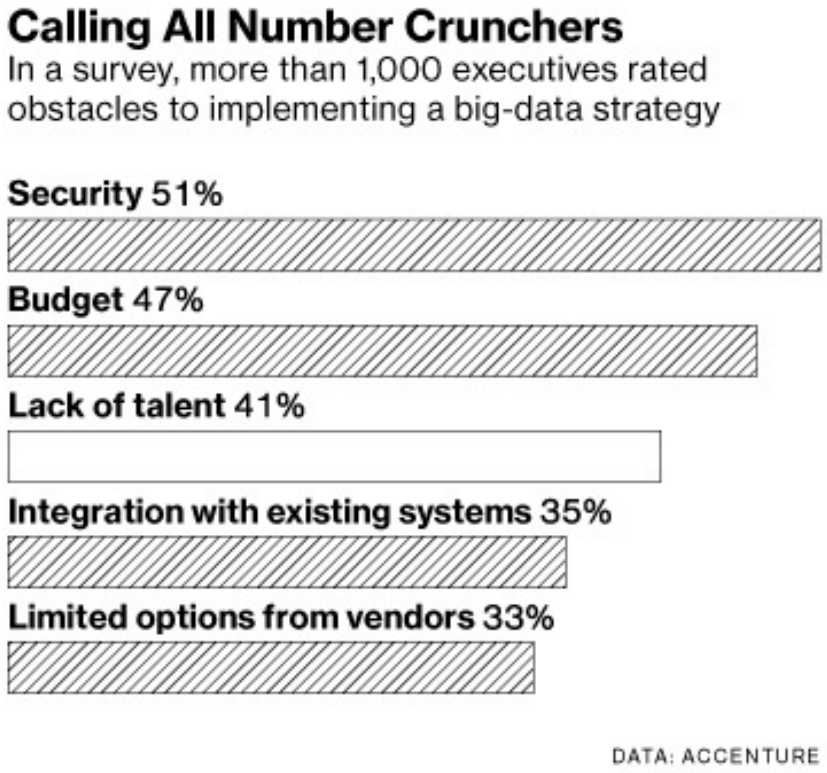
http://www.klcommunications.com/blog/anonymity-in-a-big-data-world/
https://www.novell.com/events/data-governance-webinars/

ANALYTICS

Data Scientist: The Sexiest Job of the 21st Century

by Thomas H. Davenport and D.J. Patil

FROM THE OCTOBER 2012 ISSUE



https://hbr.org/2012/10/data-scientist-the-sexiest-job-of-the-21st-century/
http://www.bloomberg.com/news/articles/2015-06-04/help-wanted-black-belts-in-data

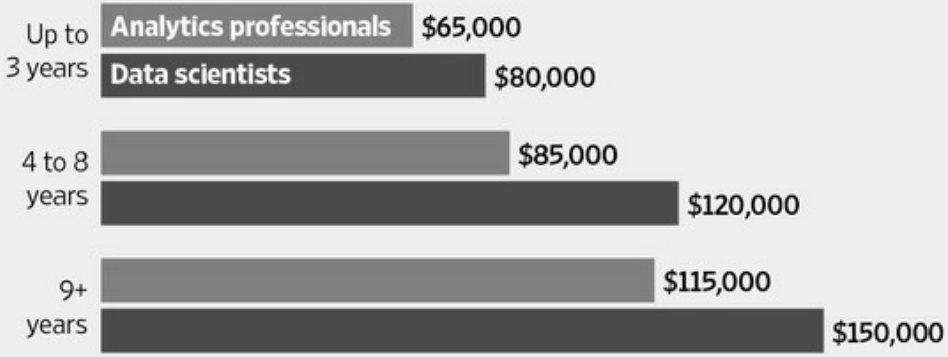
CAREER PROFILE

Data Scientist

ROLES	Data scientist, business analyst, Chief Data Officer, analytics manager, DevOps
MINIMUM EDUCATION	Master's degree recommended
RELEVANT AREAS OF STUDY	Statistics, analytics, mathematics, computer science, engineering, physics
TECHNOLOGY SKILLS	Data analytics, algorithms, neural networks, machine learning, artificial intelligence
POTENTIAL COMPANIES TO WORK FOR	Academia, healthcare, SMBs, large enterprises, PR/Advertising/Marketing agencies, research firms, technology companies, manufacturing, retail.
NATIONAL MEDIAN SALARY	**$93,146**

Big Data, Big Paycheck

Median salary for analytics professionals and those specifically within data science, by level of experience.



Note: Data do not include managers Source: Burtch Works The Wall Street Journal

http://www.cio.com/article/3057574/careers-staffing/it-career-roadmap-data-scientist.html
http://www.wsj.com/articles/SB10001424052702304819004579489541746990638

Course Goal (1/2)

- After taking this course, you are expected to be able to
- Make sense of the world through data
  - Select the right data
  - Prepare the data for analysis
  - Derive insights and knowledge that are useful for decision making
  - Communicate analyses and insights via visualization

Course Goal (2/2)

- After taking this course, you are expected to be able to
- Be able to "do it" by
  - Hands-on work with real tools (Tableau Desktop, Piktochart, Excel)
  - Retrieve the real-world data and clean them
  - Analyze and visualize the data with tools

Schedule (1/3, subject to change)

Week	Date	Topic
1	Sep-01	Introduction Data and Science
2	Sep-08	Data and Metadata In Data We (Mis)Trust
3	Sep-15	Introduction to Tableau (I)
4	Sep-22	Introduction to Tableau (II) Viewing Data
5	Sep-29	Visualizing Data (I) Exam #1 Review
6	Oct-06	Exam #1 Storytelling with Infographics

Schedule (2/3, subject to change)

Week	Date	Topic
7	Oct-13	Visualizing Data (II)
8	Oct-20	Dirty Data Data Cleansing
9	Oct-27	Choosing Relevant Data Key Performance Indicators Exam #2 Review
10	Nov-03	Exam #2 Creating Interactive Dashboards
11	Nov-10	Beyond Numbers Twitter Sentiment Analysis

Schedule (3/3, subject to change)

Week	Date	Topic
12	Nov-17	Integrating Data Aggregating Data
	Nov-24	Thanksgiving Day (No Class)
13	Dec-01	Predicting the Future Predictive Analytics Using Tableau
14	Dec-08	Data Science and Your Career Exam #3 Review
	Dec-15	Exam #3

Evaluation

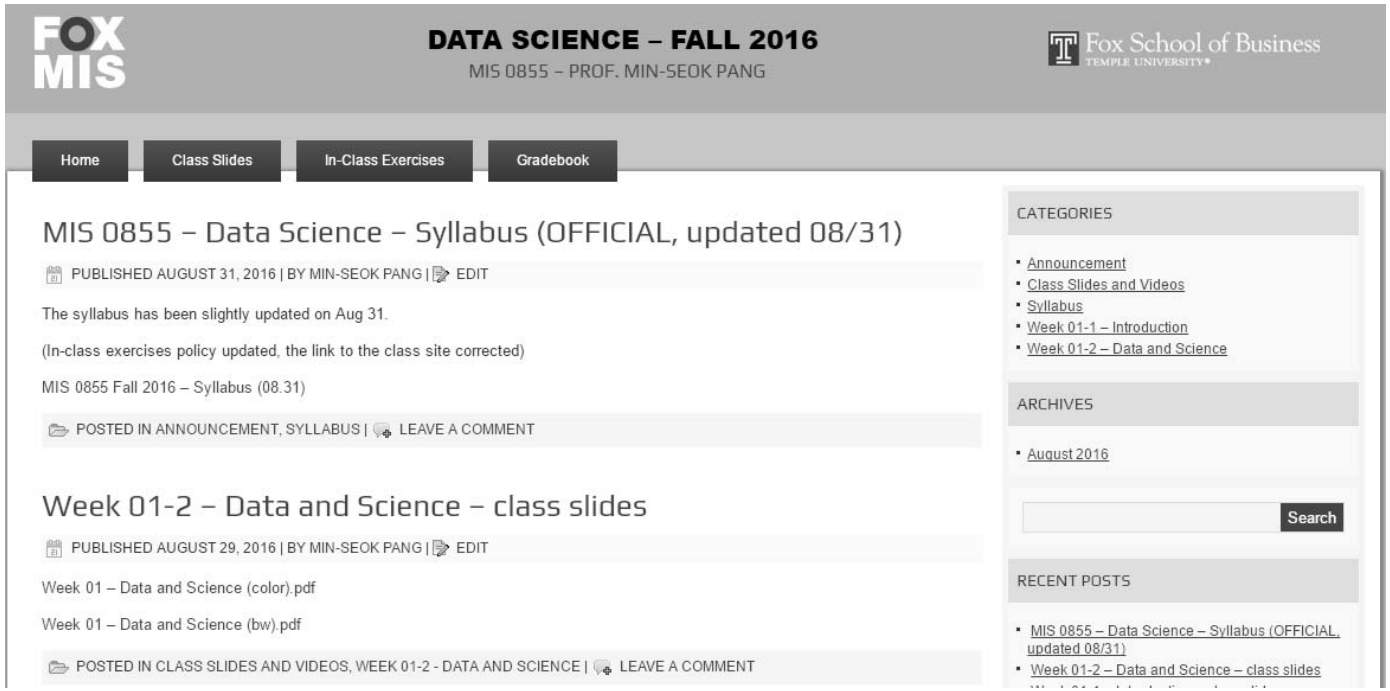
Assignments #1 - #4	35%
Assignment #5 (Term Project)	10%
Three Exams	45%
In-Class Exercise	10%

94% - 100%	A	73% - 76.99%	C
90% - 93.99%	A-	70% - 72.99%	C-
87% - 89.99%	B+	67% - 69.99%	D+
83% - 86.99%	B	63% - 66.99%	D
80% - 82.99%	B-	60% - 62.99%	D-
77% - 79.99%	C+	< 60%	F

Assignments (45%)

#	Assignment	Due Date
1	Create a Data Analysis Plan	Fri, Sep 16
2	Analyze a Data Set Using Tableau	Mon, Sep 26
3	Analytics Challenge	Mon, Oct 31
4	Cleaning a Data Set	Mon, Nov 14
5	Group Data Analysis (Term Project)	Fri, Dec 9

Class Site at MIS Community



- http://community.mis.temple.edu/mis0855sec005fall16/
- All class materials, announcements, and grades will be posted here.
- Blackboard is only for assignment submission.

Software Tools to Use

- Tableau Desktop 9.3 (A free education copy will be provided.)
- Microsoft Excel
- Piktochart (We will use a free version.)
- A basic-level of skills in Excel is desired.

Academic Integrity

- ZERO TOLERANCE
- Plagiarizing others' work without references will be reported to the University immediately.
- If deliverables submitted by multiple students are suspected to be work of one single person, the instructor will report to the University as a cheating.
- DO NOT SHARE ANY FILE THAT YOU CREATE WITH ANYONE.

Three Exams (15% each)

- Oct 6, Nov, 3 and Dec 15 (tentative)
- Based on readings, class slides, in-class exercises, and assignments
- Closed-books-closed-notes
- Exam #2 is not cumulative. Exam #3 covers the whole course.
- Consist of multiple-choices and short-answer questions
- Review sessions before the exams

In-Class Exercises (10%)

- There will be one or two in-class exercises (either group or individual) every week.
- All in-class exercises will be counted toward the grade.
- Deliverables from in-class exercises will be graded by success or fail.
- Up to three missing in-class exercises will be excused.
  - Use this opportunity only if it is necessary!

Class Policies (1/2)

- Keep monitoring announcements at the class site.
- Using laptops or tablets is allowed only for class-related activities.
  - Should close laptops while the instructor plays a video.
- Please use @temple.edu account for all correspondents with the instructor. Email messages sent from a non-Temple account may not be responded.

Class Policies (2/2)

- Please turn off or mute cell phones. Do not send emails, texts, or tweets during class.
- In case of severe weather, we will meet as long as the University is open.