

BSAD 8700 - Business Analytics

Welcome to Business Analytics!

Instructor: Dusty White, PhD

Who am I?

- Economics Faculty Member
 - Undergrad in Economics, from Brigham Young University
 - PhD in Economics, from Washington State University
 - Data and Data Analytics are my passion!

Contacting me

Email: drwhite@unomaha.edu

Slack: datascienceuno.slack.com

- Use the `#businessanalytics` channel for this class
- Be sure to sign up with your UNO email

I am also happy to arrange meetings by Zoom if you would like a more personal interaction. We can and will find a time that works for both of us!

Course material

The entire course is accessible through [Canvas](#)!

- You will find lectures here
- You will submit assignments and projects here
- You will find links to all documents here

Software needed for class

- [Tableau Desktop](#) (we will provide a license for the duration of the course!)
- [Orange Data Mining](#)
- [SQLectron](#), a great and free SQL interface
- Microsoft Excel

What do you hope to get out of this course?

Let me know in the Slack channel!

How will this course help you?

- Learn the principles of analytics
- Learn to communicate with Data Analysts
- Learn when Data Analytics should be used
- Understand when Analytics is not being correctly applied.

I'm a Manager, not a Data Scientist...

"It is important to understand data science even if you never intend to apply it yourself. Data-analytic thinking enables you to evaluate proposals for data mining projects. For example, if an employee, a consultant, or a potential investment target proposes to improve a particular business application by extracting knowledge from data, you should be able to assess the proposal systematically and decide whether it is sound or flawed. ... [Y]ou should be able to spot obvious flaws, unrealistic assumptions, and missing pieces."

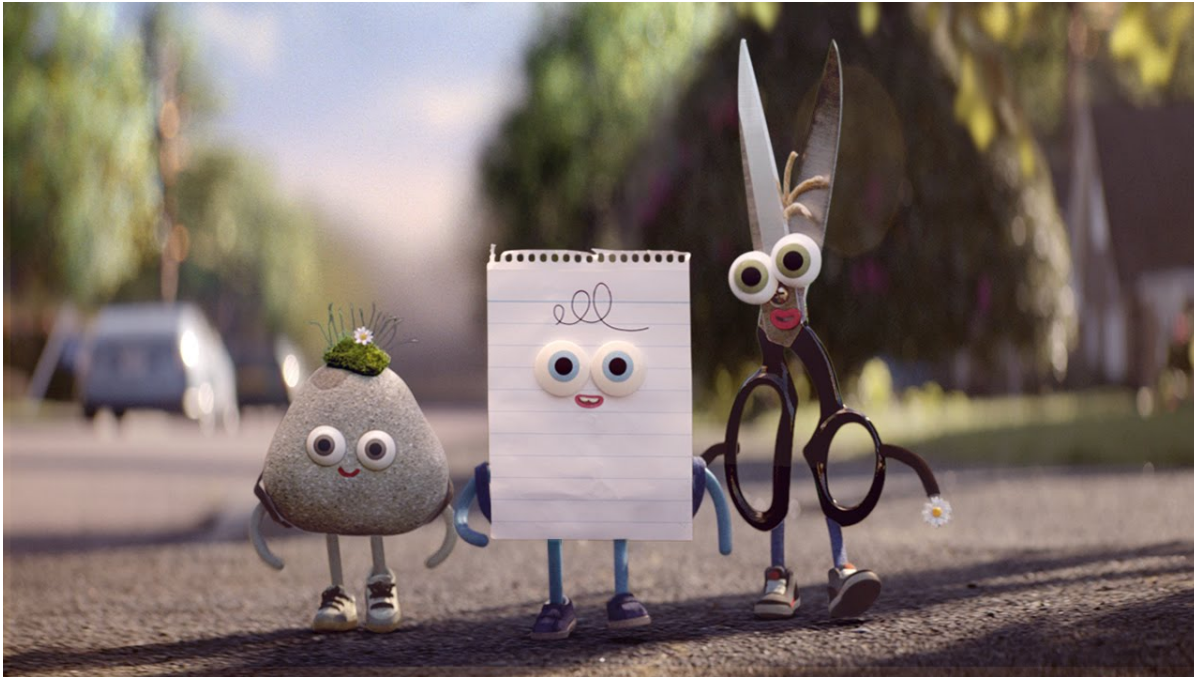
-- Data Science for Business

How can you be successful in this class?

- Do the required readings, and then be active in discussions on Slack!
- Be ready to “get your hands dirty” in lab
- Collaborate with classmates (it's required!)
- Always ask questions!
 - I only know what is interesting to ME
 - Tell me what is interesting to YOU, and I can talk about it

Let's Get Started!

Play a Game



Start by playing a simple game (I recommend about 20 rounds) of [Rock, Paper, Scissors](#)

Where do we actually use models like this?

[The Economist](#) gives us a few examples:

- Predict Repeat Offenders
- Predict Heart Attacks in Hospital Patients
- Predict at-risk Students, Police Officers
- Find children at risk of lead poisoning

Why are these models so valuable to us?

Computers have the ability to "see" lots of data points at once, so if we use algorithms carefully, we can utilize vast amounts of data to inform our decisions.

What is data?

Data is a representation of objects or information from the real world

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Data is a representation of objects or information from the real world

- Census responses are data

DEPARTMENT OF COMMERCE—BUREAU OF THE CENSUS
FIFTEENTH CENSUS OF THE UNITED STATES: 1947
POPULATION SCHEDULE

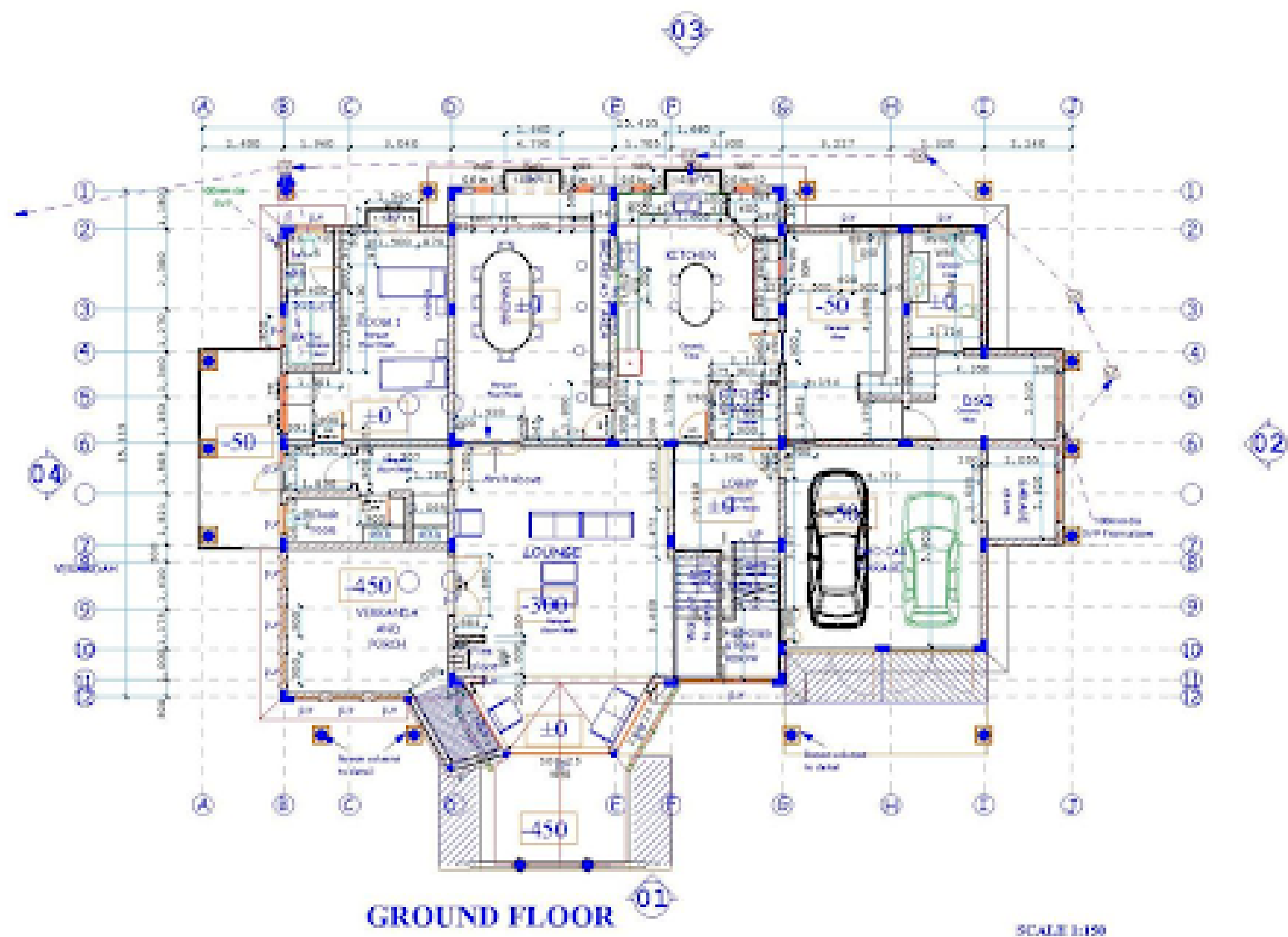
Examined by me on April 1, 1880, Samuel Beardsley, Clerk.

DATE	NAME	ADDRESS	CITY	STATE	COUNTRY	OCCUPATION	EDUCATION	RELIGION	POLITICAL	SOCIAL	FAMILY	MARRIAGE	CHILDREN	PROPERTY	VEHICLE	MILITARY	REMARKS
1910-01-01	John Doe	123 Main St	New York	NY	USA	Teacher	High School	Protestant	Republican	Member	Married	2 Children	House	Car			
1910-02-15	Jane Smith	456 Elm St	Chicago	IL	USA	Nurse	College	Catholic	Democrat	Member	Single	0 Children	Apartment				
1910-03-10	Robert Johnson	789 Oak St	Los Angeles	CA	USA	Engineer	University	Methodist	Republican	Member	Married	3 Children	House	Car			
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1910-09-03	Charles Davis	369 Walnut St	Seattle	WA	USA	Engineer	University	Catholic	Republican	Member	Married	2 Children	House	Car			
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1913-01-13	Grace Wilson	470 Elm St	Denver	CO	USA	Nurse	High School	Protestant	Democrat	Member	Single	0 Children	Apartment				
1913-02-21	Frank Moore	581 Oak St	San Jose	CA	USA	Engineer	College	Methodist	Republican	Member	Married	3 Children	House	Car			
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Data is a representation of objects or information from the real world

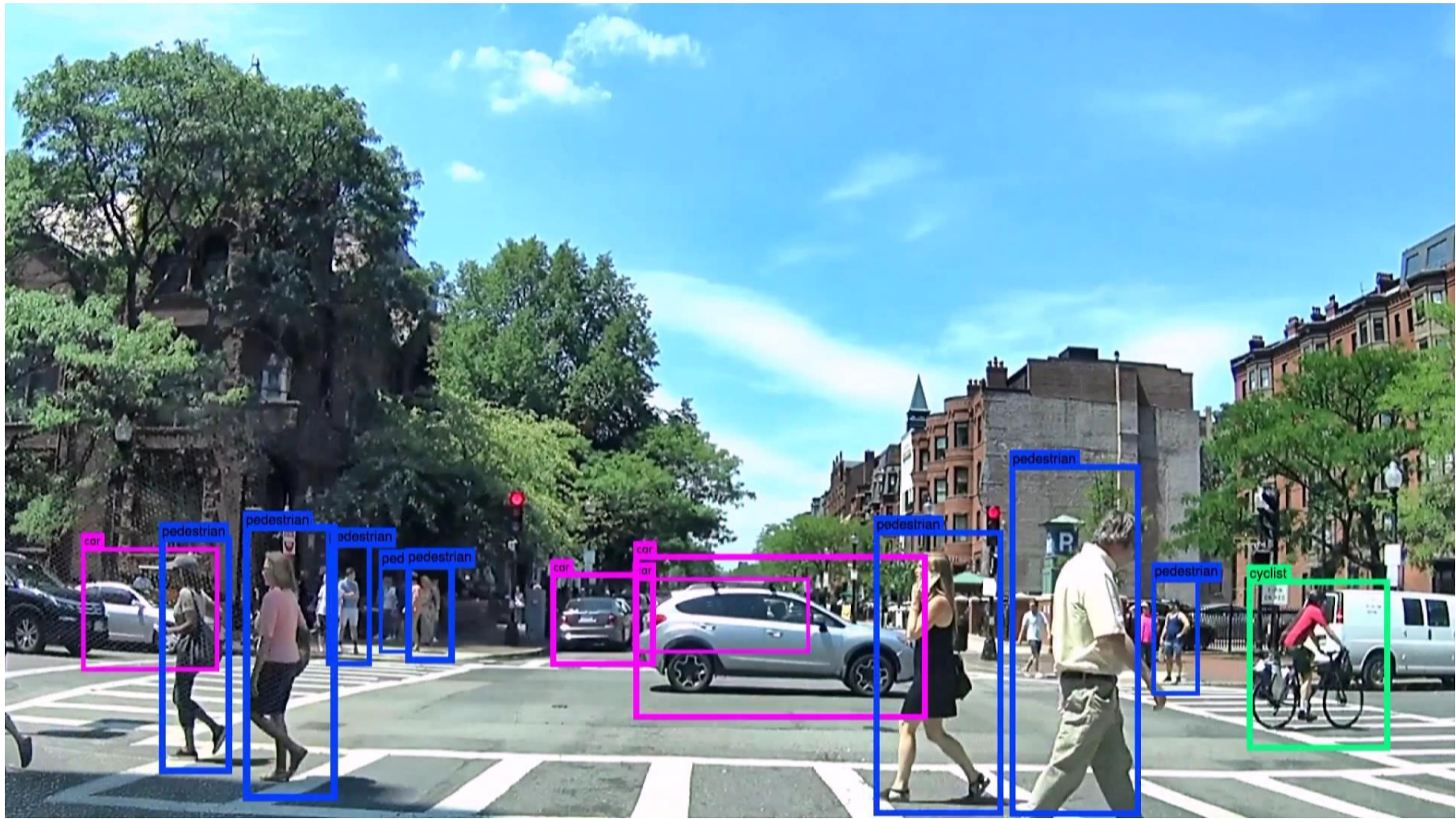
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- Images are data
- Financial records are data

Cash Flow

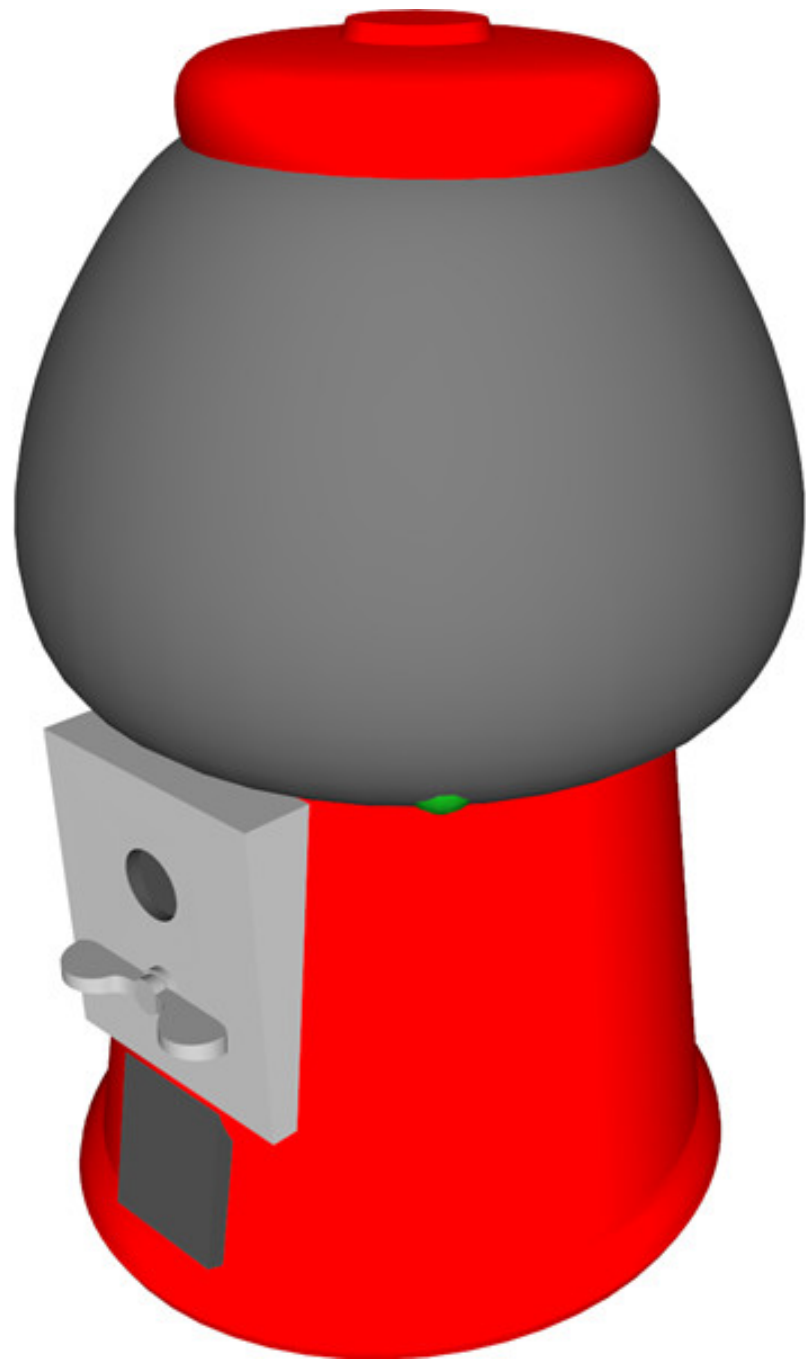
Date: February 2013

Account	Description	March 2000	February 2000	Current Change	YTD March 2000
Cash Flow From Operations					
0	Net Income	365,102	361,218	3,884	3,884,060
1100	Net change in Accounts receivable - trade	202,826	(299,201)	502,028	(3,067,762)
1110	Net change in Accounts receivable - other	1,310	1,179	131	14,938
1199	Net change in Allowance for bad debts	4,373	4,327	47	46,523
1200	Net change in Inventory	(5,386)	(10,027)	4,642	(208,522)
1900	Net change in Other current assets	(1,804)	(2,035)	231	(22,825)
3000	Net change in Accounts payable	40,428	40,086	342	595,083
3100	Net change in Accrued payroll	(491)	(406)	(85)	(5,492)
3400	Net change in Other current liabilities	12,819	12,146	673	141,702
Total	Cash Flow From Operations	619,177	107,286	511,891	1,377,705
Cash Flow From Investments					
2900	Increases in Other assets	(398)	(420)	22	(5,126)
2000	Decreases in Fixed assets	354	346	8	4,027
2100	Decreases in Accumulated depreciation	23,107	22,862	246	245,823
Total	Cash Flow From Investments	23,063	22,788	276	244,724
Cash Flow From Financing					
3500	Increases in Long-term notes	279	318	(39)	4,163
3900	Increases in Other liabilities	261	189	72	2,506
4000	Increases in Capital stock	211	203	8	2,501
Total	Cash Flow From Financing	751	710	41	9,170
Total Cash Flow		642,991	130,783	512,208	1,631,599

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- Census responses are data
- Blueprints are data
- Images are data
- Financial records are data
- CAD designs are data



Defining Data Analytics

Good luck! 😜

But seriously, **Data Analytics** is a notoriously broad term describing pretty much anything that uses some data with any amount of analysis of that data to make decisions. Let's try some better terminology...

Definitions

Predictive Analytics - Using data to predict outcomes on an individual level

Forecasting - Using data to predict macro-level outcomes

Why now? Why not when computers were invented?

- More Data
 - There has been a tremendous increase in the amount of data available to companies
- More Computer Power
 - In 2005, my laptop had $\frac{3}{4}$ GB of RAM, and cost over \$2000
 - As of 2014, my laptop (still at just over \$2000) had 16GB of RAM, nearly a 2000% increase! The same was true of the increase in processor performance.
 - Today, a similar laptop can be purchased for closer to \$1000

Why now?

- Synergy between Data and Computation Power
 - We now have enough data to make meaningful conclusions
 - We have enough computational power!
 - [OmniSci](#), [more OmniSci](#)
 - NVIDIA GTX 1080 Ti: ~11 TFlops (11 trillion operations per second)
 - Only costs \$599

So where can we get the data we need?

Anywhere that records are kept, if the owner is willing to share.

- Facebook, Twitter, and LinkedIn all collect very robust information on users and their interactions
- We could also record our own data if needed: surveys, usage statistics, credit card transactions, etc.

So where can we get the data we need?

Some of my all-time favorites:

- IPUMS.org
- Data.gov
- ICPSR@UMich

So the data will magically analyze itself, right?!

- Just like a book that is never read, data that is only recorded and never used is not that useful
- We need to find a way to UTILIZE data
- That is what we will learn about during the rest of this class!

We need to ask questions!

Exploring data helps us to find the questions we care about

Let's use Tableau to explore our data

For lab today

- Complete part 1 of the first project
 - Find a group (use Slack!)
 - Play with the [example data](#) in Tableau
 - Variable descriptions are available [here](#)
 - Choose a research question

If you need, remember that Tableau provides all sorts of great training videos. I have posted some of my favorites on Canvas.