Plan for Today

- 9:00 Intro
- 9:30 Visual Variables
- **10:15 Break**
- 10:30 Sketching
- 11:30 Vis Software & Tools
- **12:00 Lunch**
- 1:00 Tableau
- **2:30 Break**
- 3:30 Vis in the Library & Professional Practice
- 4:00 Work with Data

http://bit.ly/tfdlvis

Tableau

Goals

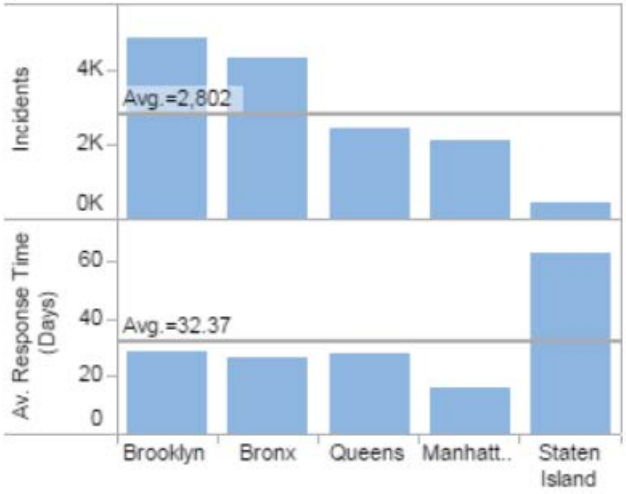
1. What is Tableau?
2. What your data should look like
3. How to change between chart types
4. Interactive visualization
5. “Real” data w/ Tableau

1. What is Tableau?

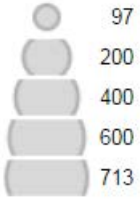
- Developed out of Stanford student's PhD project
- Designed for exploration of large multi-dimensional datasets
- Pick the data you are interested in, **then** explore to find the best chart type
- When Excel just isn't enough …

Graffiti in NYC

Graffiti by Borough: Select to Filter



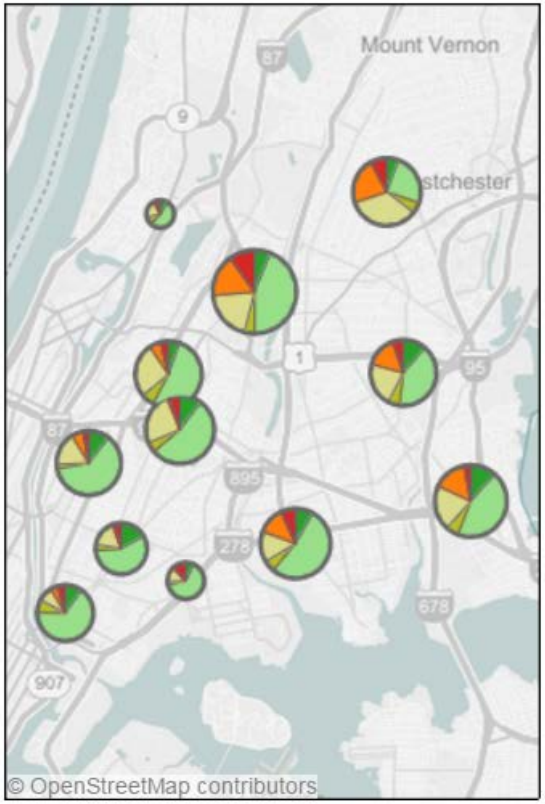
Incidents



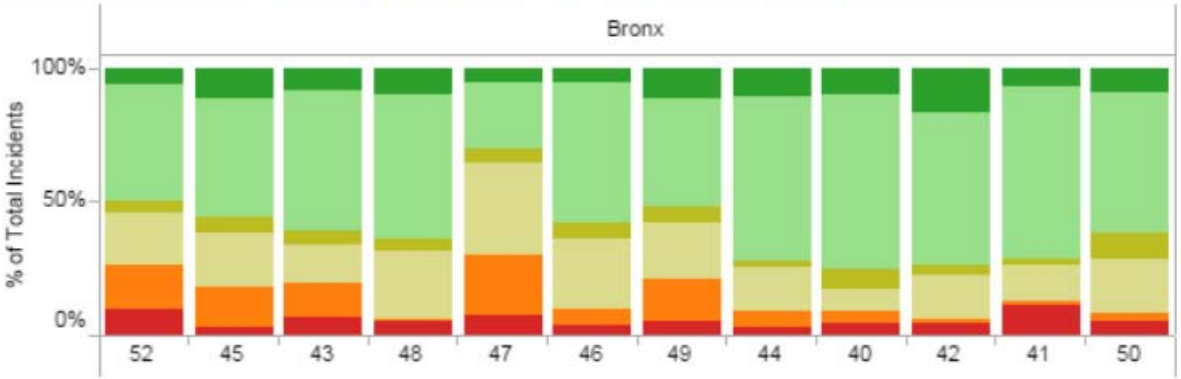
Resolution Action:

- Crew dispatched, no graffiti
- Crew dispatched, site cleaned
- Graffiti intentional
- Pending inspection
- Reported by a non-owner
- Site to be cleaned

Graffiti by Precinct and Resolution



Graffiti by Precinct (sorted by Count of Incidents)



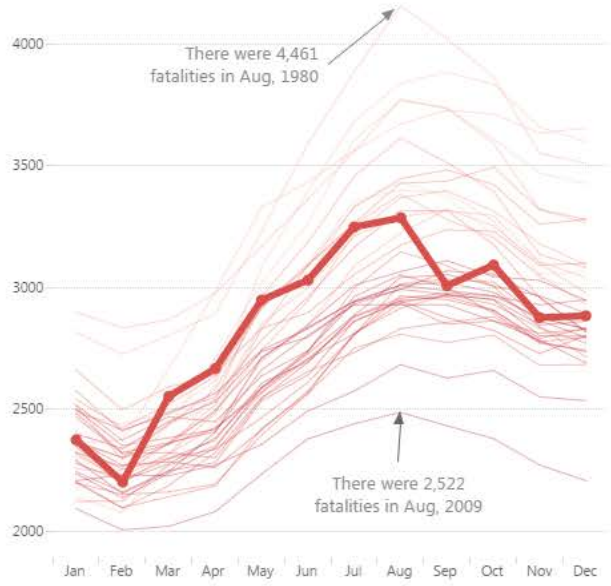
Fewer people are dying on US roads, but seasonal trends persist.

There have been 1,263,670 road fatalities in the US between 1979 and 2011. This dashboard explores the seasonality in the data.

Data from the National Highway Traffic Safety Administration: http://www-nrd.nhtsa.dot.gov/Cats/Index.aspx

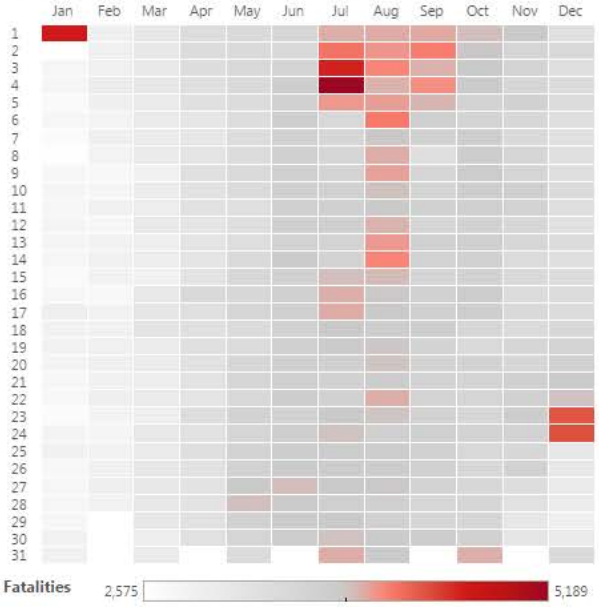
1. Every year sees the same peaks (**August**) and troughs (**February**) in fatalities

Fatalities by month. Single year Average (all years)



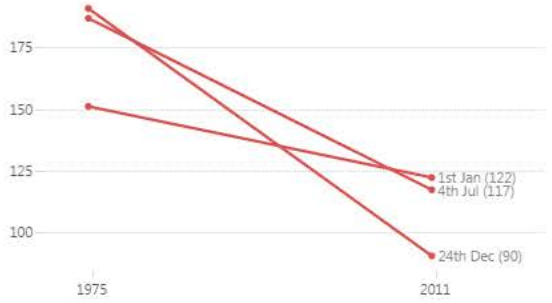
2. Three holidays (**New Year, July 4th, Christmas**) are particularly lethal

Highlight table of fatalities by day and month for years: **All**

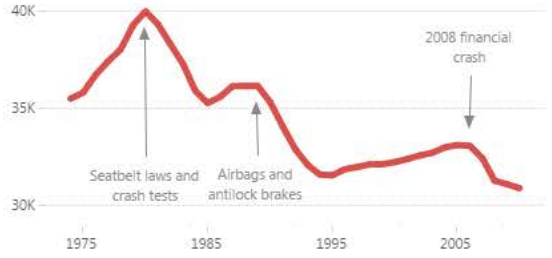


3. Fortunately, those holidays are getting safer...

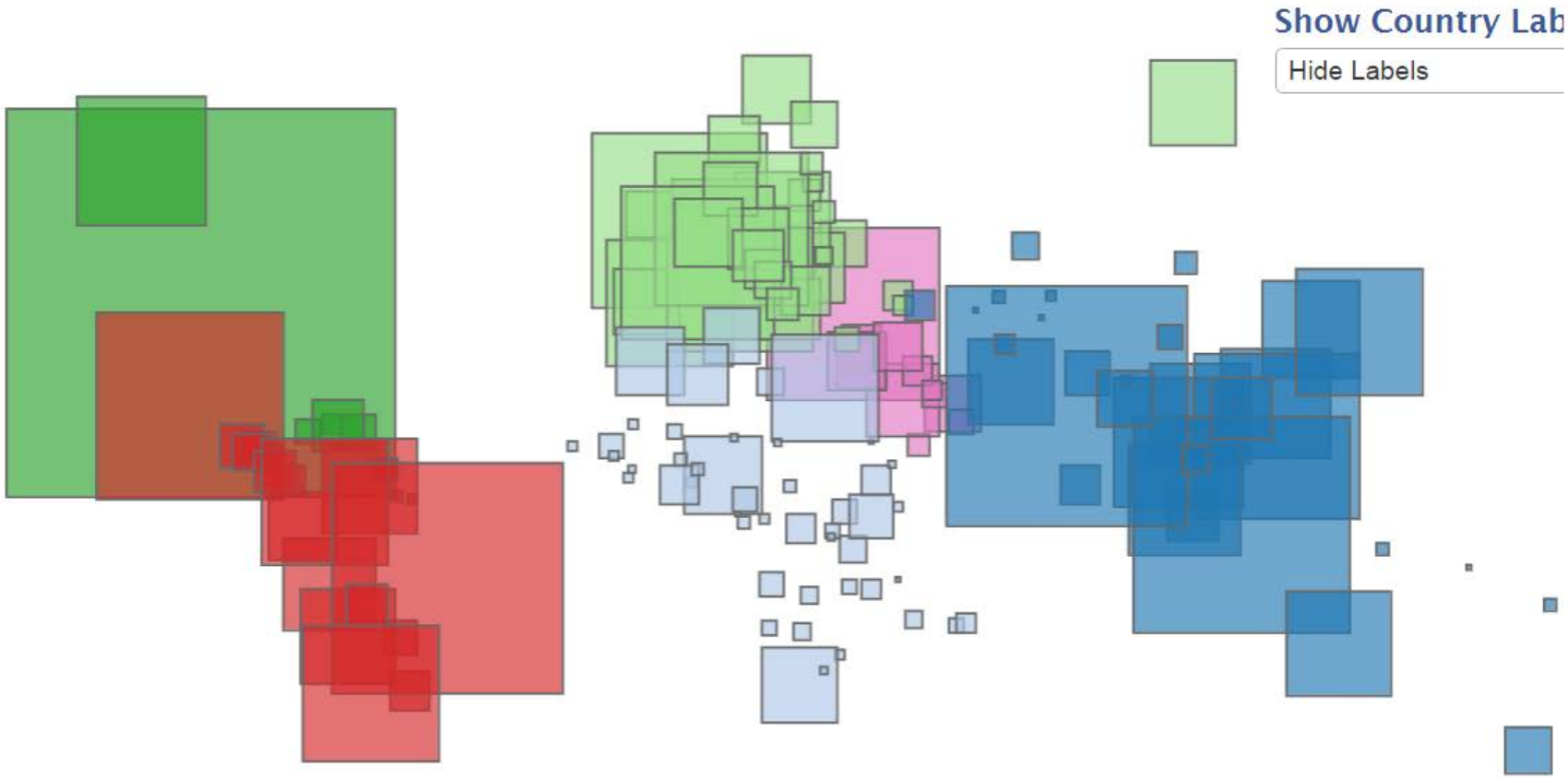
Slope chart of deaths on 3 most dangerous days



... which is part of an overall reduction in fatalities



new map of the world, countries sized by facebook population



Do a Presidential candidate's Twitter followers peak before they rise in the polls? Decide for yourself with this viz.

Twitter Peaks, Polls Shift?

140ELECT

Choose Candidate

- (•) Bachmann
- ( ) Cain
- ( ) Gingrich
- ( ) Paul
- ( ) Perry
- ( ) Romney

Hover over blue peaks to see Top Tweets.

Poll % (moving avg 5 prior polls) New Twitter Followers

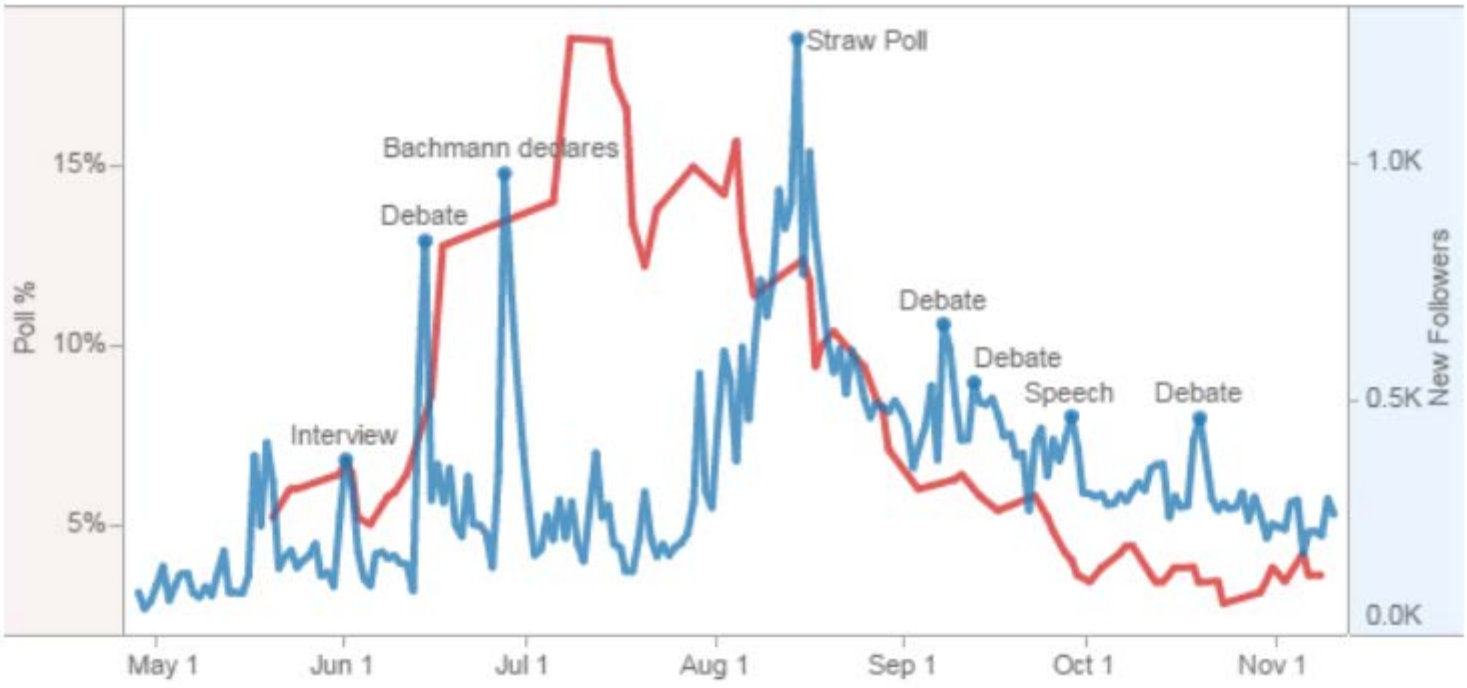


Tableau Versions

Server $10,000+
- All capabilities
- Can publish results to web & restrict access
- UCalgary IT has a license for this

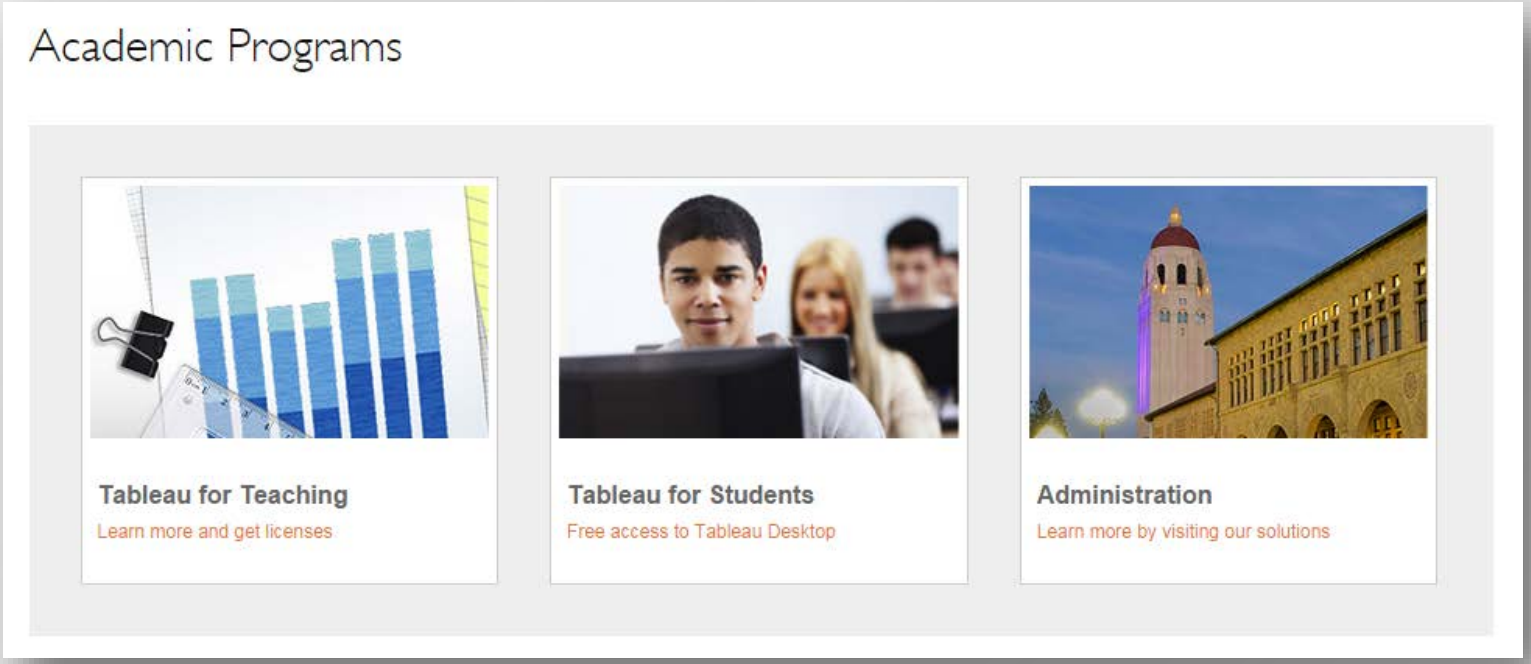
Desktop $1000/2000
- "Personal" version doesn't have server data connections
- For both Windows and Mac
- Can publish results to Tableau's website

Online $500
- Cloud version, hosted by Tableau

Public Free
- All data becomes publically available to anyone
- 1 GB of data

Student Program

- Tableau desktop **free** for post-secondary students.
- Also available for those who want to teach with it .
- http://www.tableau.com/academic



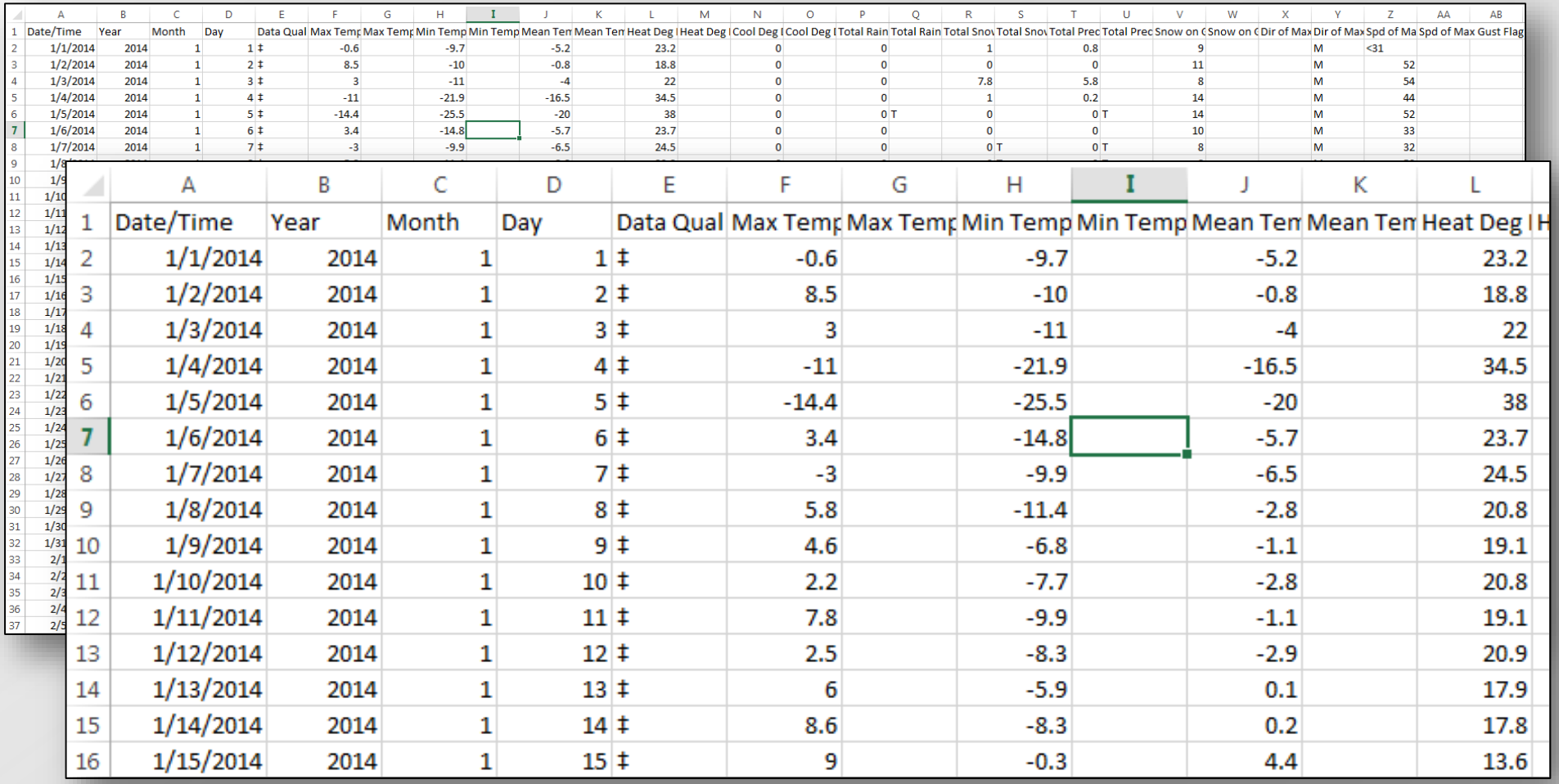
2. Tableau & Data

- File *(excel, csv)*
- Database *(Access, Oracle, MySQL)*
- Online Sources *(Google Analytics, Amazon Redshift)*

Data

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1	Date/Time	Year	Month	Day	Data Qual	Max Temp	Max Temp	Min Temp	Min Temp	Mean Ten	Mean Ten	Heat Deg	Heat Deg	Cool Deg	Cool Deg	Total Rain	Total Rain	Total Snov	Total Snov	Total Prec	Total Prec	Snow on G	Snow on G	Dir of Max	Dir of Max	Spd of Ma	Spd of Max	Gust Flag
2	1/1/2014	2014	1	1	‡	-0.6		-9.7		-5.2		23.2		0		0		1		0.8		9			M	<31		
3	1/2/2014	2014	1	2	‡	8.5		-10		-0.8		18.8		0		0		0		0		11			M	52		
4	1/3/2014	2014	1	3	‡	3		-11		-4		22		0		0		7.8		5.8		8			M	54		
5	1/4/2014	2014	1	4	‡	-11		-21.9		-16.5		34.5		0		0		1		0.2		14			M	44		
6	1/5/2014	2014	1	5	‡	-14.4		-25.5		-20		38		0		0	T	0		0	T	14			M	52		
7	1/6/2014	2014	1	6	‡	3.4		-14.8		-5.7		23.7		0		0		0		0		10			M	33		
8	1/7/2014	2014	1	7	‡	-3		-9.9		-6.5		24.5		0		0		0	T	0	T	8			M	32		
9	1/8/2014	2014	1	8	‡	5.8		-11.4		-2.8		20.8		0		0		0	T	0	T	8			M	50		
10	1/9/2014	2014	1	9	‡	4.6		-6.8		-1.1		19.1		0		0		0		0		7			M	59		
11	1/10/2014	2014	1	10	‡	2.2		-7.7		-2.8		20.8		0		0		0		0					M	44		
12	1/11/2014	2014	1	11	‡	7.8		-9.9		-1.1		19.1		0		0		0	T	0	T	4			M	83		
13	1/12/2014	2014	1	12	‡	2.5		-8.3		-2.9		20.9		0		0		2.9		1.2		4			M	59		
14	1/13/2014	2014	1	13	‡	6		-5.9		0.1		17.9		0		0		2.8		2.6		8			M	87		
15	1/14/2014	2014	1	14	‡	8.6		-8.3		0.2		17.8		0		0		0		0		8			M	76		
16	1/15/2014	2014	1	15	‡	9		-0.3		4.4		13.6		0		0		0		0		3			M	67		
17	1/16/2014	2014	1	16	‡	9.1		-3.3		2.9		15.1		0		0		0		0		2			M	32		
18	1/17/2014	2014	1	17	‡	9.8		-0.5		4.7		13.3		0		0		0		0		2			M	48		
19	1/18/2014	2014	1	18	‡	12.8		-4.2		4.3		13.7		0		0		0		0		0			M	50		
20	1/19/2014	2014	1	19	‡	6.6		-2		2.3		15.7		0		0		0		0		0			M	39		
21	1/20/2014	2014	1	20	‡	4.2		-7.6		-1.7		19.7		0		0		0		0		0			M	43		
22	1/21/2014	2014	1	21	‡	2.6		-5.4		-1.4		19.4		0		0	T	0		0	T	0			M	<31		
23	1/22/2014	2014	1	22	‡	-0.9		-8.2		-4.6		22.6		0		0		1.2		1.2		1			M	<31		
24	1/23/2014	2014	1	23	‡	8.9		-5.5		1.7		16.3		0		0	T	0		0	T	1			M	<31		
25	1/24/2014	2014	1	24	‡	12.4		0.9		6.7		11.3		0		0		0		0		0			M	32		
26	1/25/2014	2014	1	25	‡	11.2		0.5		5.9		12.1		0		0		0		0		0			M	56		
27	1/26/2014	2014	1	26	‡	3.5		-12.4		-4.5		22.5		0		0		0	T	0	T	0			M	78		
28	1/27/2014	2014	1	27	‡	-7.6		-14.7		-11.2		29.2		0		0		0		0		0			M	<31		
29	1/28/2014	2014	1	28	‡	6.3		-12.5		-3.1		21.1		0		0		0		0		0			M	44		
30	1/29/2014	2014	1	29	‡	2.8		-13.2		-5.2		23.2		0		0		6.4		3.2		0			M	43		
31	1/30/2014	2014	1	30	‡	-11.9		-17.4		-14.7		32.7		0		0		0	T	0	T	5			M	46		
32	1/31/2014	2014	1	31	‡	-7.2		-19.2		-13.2		31.2		0		0		0.2		0.2		5			M	50		
33	2/1/2014	2014	2	1	‡	-7.5		-17.5		-12.5		30.5		0		0		0		0		3			M	<31		
34	2/2/2014	2014	2	2	‡	-8.4		-15.5		-12		30		0		0		0	T	0	T	0			M	39		
35	2/3/2014	2014	2	3	‡	-12.1		-20.9		-16.5		34.5		0		0		3		1.7		0			M	50		
36	2/4/2014	2014	2	4	‡	-20.2		-23.1		-21.7		39.7		0		0		0.2		0.2		8			M	37		
37	2/5/2014	2014	2	5	‡	-20.2		-28.2		-24.2		42.2		0		0		0	T	0	T	4			M	<31		

Data



	A	B	C	D	E	F	G	H	I	J	K	L
1	Date/Time	Year	Month	Day	Data Qual	Max Temp	Max Temp	Min Temp	Min Temp	Mean Tem	Mean Tem	Heat Deg
2	1/1/2014	2014	1	1	‡	-0.6		-9.7		-5.2		23.2
3	1/2/2014	2014	1	2	‡	8.5		-10		-0.8		18.8
4	1/3/2014	2014	1	3	‡	3		-11		-4		22
5	1/4/2014	2014	1	4	‡	-11		-21.9		-16.5		34.5
6	1/5/2014	2014	1	5	‡	-14.4		-25.5		-20		38
7	1/6/2014	2014	1	6	‡	3.4		-14.8		-5.7		23.7
8	1/7/2014	2014	1	7	‡	-3		-9.9		-6.5		24.5
9	1/8/2014	2014	1	8	‡	5.8		-11.4		-2.8		20.8
10	1/9/2014	2014	1	9	‡	4.6		-6.8		-1.1		19.1
11	1/10/2014	2014	1	10	‡	2.2		-7.7		-2.8		20.8
12	1/11/2014	2014	1	11	‡	7.8		-9.9		-1.1		19.1
13	1/12/2014	2014	1	12	‡	2.5		-8.3		-2.9		20.9
14	1/13/2014	2014	1	13	‡	6		-5.9		0.1		17.9
15	1/14/2014	2014	1	14	‡	8.6		-8.3		0.2		17.8
16	1/15/2014	2014	1	15	‡	9		-0.3		4.4		13.6

Normalize Data

Normalized Data (you want your data shaped this way):

Company	Year	Net Income ($millions)
Citi Group	2010	10602
Citi Group	2009	-1606
Citi Group	2008	-27684
General Electric	2010	11644
General Electric	2009	11025
General Electric	2008	17410
Siemens AG	2010	5554
Siemens AG	2009	3650
Siemens AG	2008	8504
Koninklijke Philips Electronic	2010	1948
Koninklijke Philips Electronic	2009	608
Koninklijke Philips Electronic	2008	-262

Crosstab Data (you don't want it shaped like this):

Net Income (millions of dollars)			
Company	2010	2009	2008
Citi Group	10602	-1606	-27684
General Electric	11644	11025	17410
Siemens AG	5554	3650	8504
Koninklijke Philips Electronic	1948	608	-262

While crosstabs make sense to people, it makes our software's head hurt because each row contains three pieces of data -- in this case the company's net income in 2010, 2009 and 2008. Tableau feels much more comfortable when data is in a normalized format, where each row contains only one net income figure.

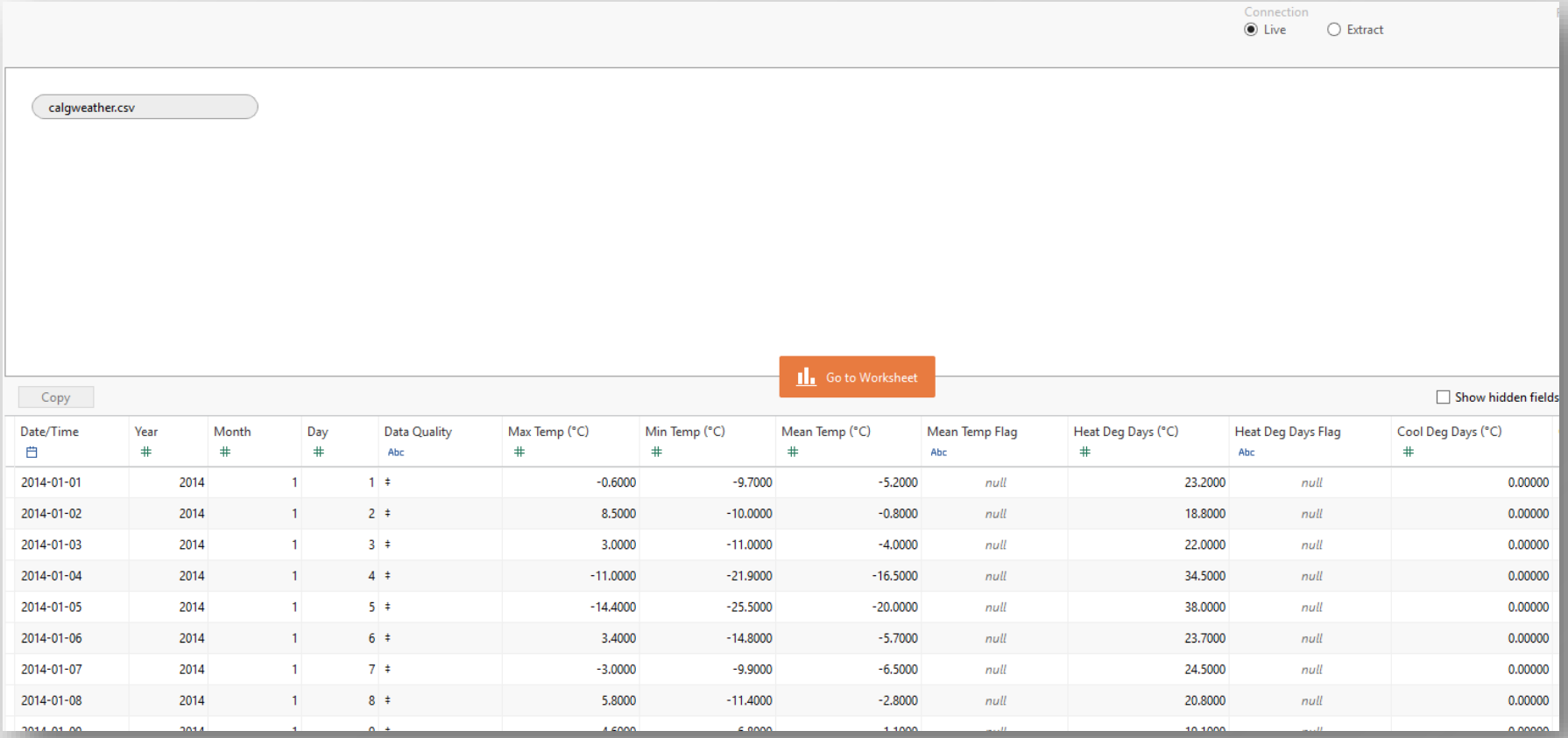
Data

- Numbers
- Text
- Dates (expects year, month, & day)
- Times
- Geography (attempts to automatically recognize)
  - Latitude & Longitude
  - Country
  - City
  - Phone area codes

Data

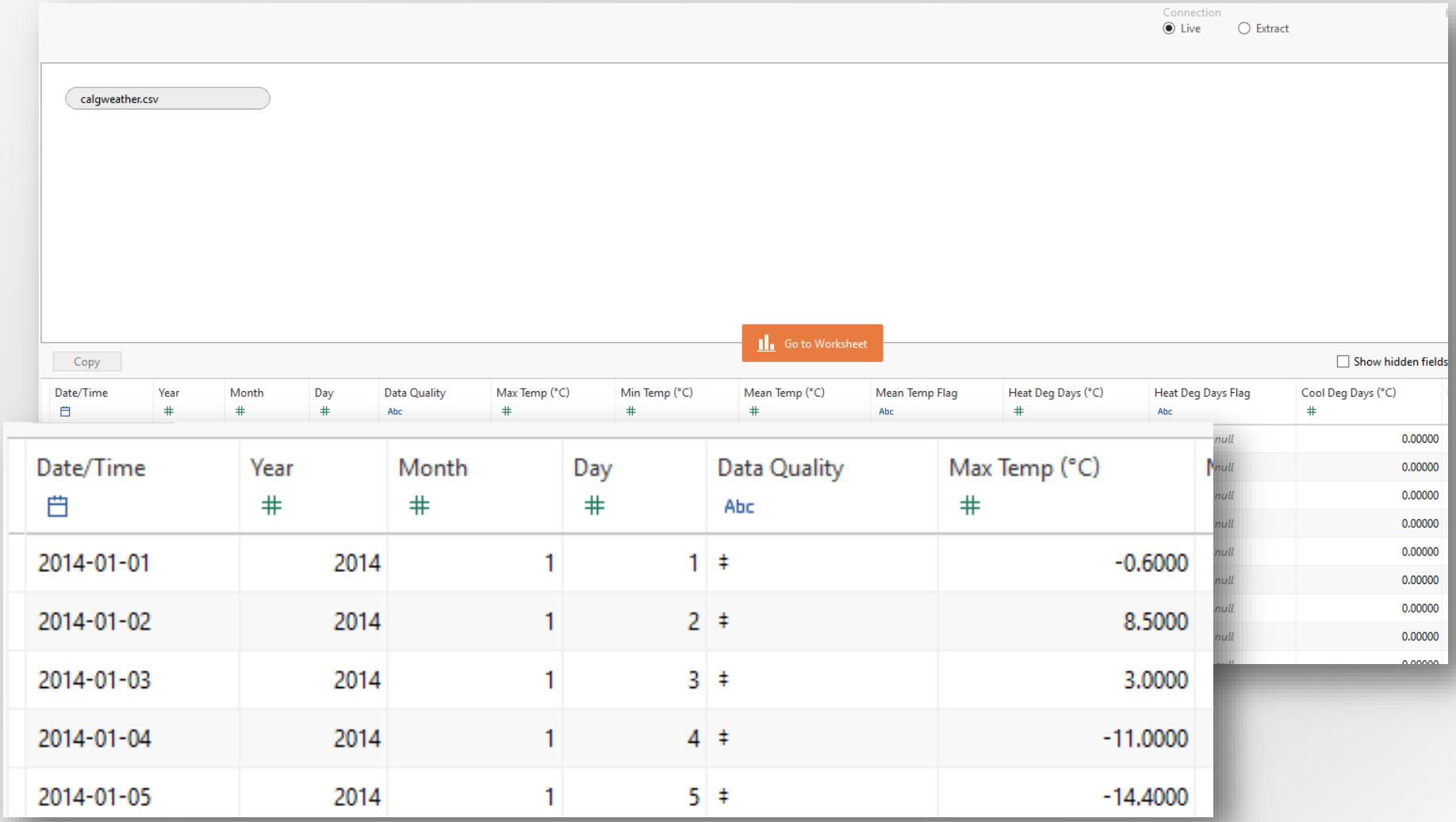
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1	Date/Time	Year	Month	Day	Data Qual	Max Temp	Max Temp	Min Temp	Min Temp	Mean Ten	Mean Ten	Heat Deg	Heat Deg	Cool Deg	Cool Deg	Total Rain	Total Rain	Total Snov	Total Snov	Total Prec	Total Prec	Snow on G	Snow on G	Dir of Max	Dir of Max	Spd of Ma
2	1/1/2014	2014	1	1	‡	-0.6		-9.7		-5.2		23.2		0		0		1		0.8		9			M	<31
3	1/2/2014	2014	1	2	‡	8.5		-10		-0.8		18.8		0		0		0		0		11			M	52
4	1/3/2014	2014	1	3	‡	3		-11		-4		22		0		0		7.8		5.8		8			M	54
5	1/4/2014	2014	1	4	‡	-11		-21.9		-16.5		34.5		0		0		1		0.2		14			M	44
6	1/5/2014	2014	1	5	‡	-14.4		-25.5		-20		38		0		0	T	0		0	T	14			M	52
7	1/6/2014	2014	1	6	‡	3.4		-14.8		-5.7		23.7		0		0		0		0		10			M	33
8	1/7/2014	2014	1	7	‡	-3		-9.9		-6.5		24.5		0		0		0	T	0	T	8			M	32
9	1/8/2014	2014	1	8	‡	5.8		-11.4		-2.8		20.8		0		0		0	T	0	T	8			M	50
10	1/9/2014	2014	1	9	‡	4.6		-6.8		-1.1		19.1		0		0		0		0		7			M	59
11	1/10/2014	2014	1	10	‡	2.2		-7.7		-2.8		20.8		0		0		0		0					M	44
12	1/11/2014	2014	1	11	‡	7.8		-9.9		-1.1		19.1		0		0		0	T	0	T	4			M	83
13	1/12/2014	2014	1	12	‡	2.5		-8.3		-2.9		20.9		0		0		2.9		1.2		4			M	59
14	1/13/2014	2014	1	13	‡	6		-5.9		0.1		17.9		0		0		2.8		2.6		8			M	87
15	1/14/2014	2014	1	14	‡	8.6		-8.3		0.2		17.8		0		0		0		0		8			M	76
16	1/15/2014	2014	1	15	‡	9		-0.3		4.4		13.6		0		0		0		0		3			M	67
17	1/16/2014	2014	1	16	‡	9.1		-3.3		2.9		15.1		0		0		0		0		2			M	32
18	1/17/2014	2014	1	17	‡	9.8		-0.5		4.7		13.3		0		0		0		0		2			M	48
19	1/18/2014	2014	1	18	‡	12.8		-4.2		4.3		13.7		0		0		0		0		0			M	50
20	1/19/2014	2014	1	19	‡	6.6		-2		2.3		15.7		0		0		0		0		0			M	39
21	1/20/2014	2014	1	20	‡	4.2		-7.6		-1.7		19.7		0		0		0		0		0			M	43
22	1/21/2014	2014	1	21	‡	2.6		-5.4		-1.4		19.4		0		0	T	0		0	T	0			M	<31
23	1/22/2014	2014	1	22	‡	-0.9		-8.2		-4.6		22.6		0		0		1.2		1.2		1			M	<31
24	1/23/2014	2014	1	23	‡	8.9		-5.5		1.7		16.3		0		0	T	0		0	T	1			M	<31
25	1/24/2014	2014	1	24	‡	12.4		0.9		6.7		11.3		0		0		0		0		0			M	32
26	1/25/2014	2014	1	25	‡	11.2		0.5		5.9		12.1		0		0		0		0		0			M	56
27	1/26/2014	2014	1	26	‡	3.5		-12.4		-4.5		22.5		0		0		0	T	0	T	0			M	78
28	1/27/2014	2014	1	27	‡	-7.6		-14.7		-11.2		29.2		0		0		0		0		0			M	<31
29	1/28/2014	2014	1	28	‡	6.3		-12.5		-3.1		21.1		0		0		0		0		0			M	44
30	1/29/2014	2014	1	29	‡	2.8		-13.2		-5.2		23.2		0		0		6.4		3.2		0			M	43
31	1/30/2014	2014	1	30	‡	-11.9		-17.4		-14.7		32.7		0		0		0	T	0	T	5			M	46
32	1/31/2014	2014	1	31	‡	-7.2		-19.2		-13.2		31.2		0		0		0.2		0.2		5			M	50
33	2/1/2014	2014	2	1	‡	-7.5		-17.5		-12.5		30.5		0		0		0		0		3			M	<31
34	2/2/2014	2014	2	2	‡	-8.4		-15.5		-12		30		0		0		0	T	0	T	0			M	39
35	2/3/2014	2014	2	3	‡	-12.1		-20.9		-16.5		34.5		0		0		3		1.7		0			M	50
36	2/4/2014	2014	2	4	‡	-20.2		-23.1		-21.7		39.7		0		0		0.2		0.2		8			M	37
37	2/5/2014	2014	2	5	‡	-20.2		-28.2		-24.2		42.2		0		0		0	T	0	T	4			M	<31
38	2/6/2014	2014	2	6	‡	-9.7		-25.4		-17.6		35.6		0		0		0		0		4			M	<31
39	2/7/2014	2014	2	7	‡	-12.8		-21.6		-17.2		35.2		0		0		0	T	0	T	3			M	37

Data

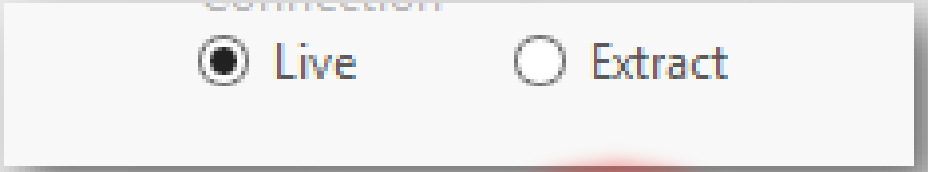


Date/Time	Year	Month	Day	Data Quality	Max Temp (°C)	Min Temp (°C)	Mean Temp (°C)	Mean Temp Flag	Heat Deg Days (°C)	Heat Deg Days Flag	Cool Deg Days (°C)
2014-01-01	2014	1	1	ǂ	-0.6000	-9.7000	-5.2000	null	23.2000	null	0.00000
2014-01-02	2014	1	2	ǂ	8.5000	-10.0000	-0.8000	null	18.8000	null	0.00000
2014-01-03	2014	1	3	ǂ	3.0000	-11.0000	-4.0000	null	22.0000	null	0.00000
2014-01-04	2014	1	4	ǂ	-11.0000	-21.9000	-16.5000	null	34.5000	null	0.00000
2014-01-05	2014	1	5	ǂ	-14.4000	-25.5000	-20.0000	null	38.0000	null	0.00000
2014-01-06	2014	1	6	ǂ	3.4000	-14.8000	-5.7000	null	23.7000	null	0.00000
2014-01-07	2014	1	7	ǂ	-3.0000	-9.9000	-6.5000	null	24.5000	null	0.00000
2014-01-08	2014	1	8	ǂ	5.8000	-11.4000	-2.8000	null	20.8000	null	0.00000

Data


Connection
Live
Extract
calgweather.csv
Go to Worksheet
Copy
Show hidden fields
Date/Time
Year
Month
Day
Data Quality
Max Temp (°C)
Min Temp (°C)
Mean Temp (°C)
Mean Temp Flag
Heat Deg Days (°C)
Heat Deg Days Flag
Cool Deg Days (°C)
2014-01-01 2014 1 1 -0.6000
2014-01-02 2014 1 2 8.5000
2014-01-03 2014 1 3 3.0000
2014-01-04 2014 1 4 -11.0000
2014-01-05 2014 1 5 -14.4000

Data



Connection
Live
Extract

calgweather.csv

Go to Worksheet

Copy

Show hidden fields

Date/Time	Year	Month	Day	Data Quality	Max Temp (°C)	Min Temp (°C)	Mean Temp (°C)	Mean Temp Flag	Heat Deg Days (°C)	Heat Deg Days Flag	Cool Deg Days (°C)
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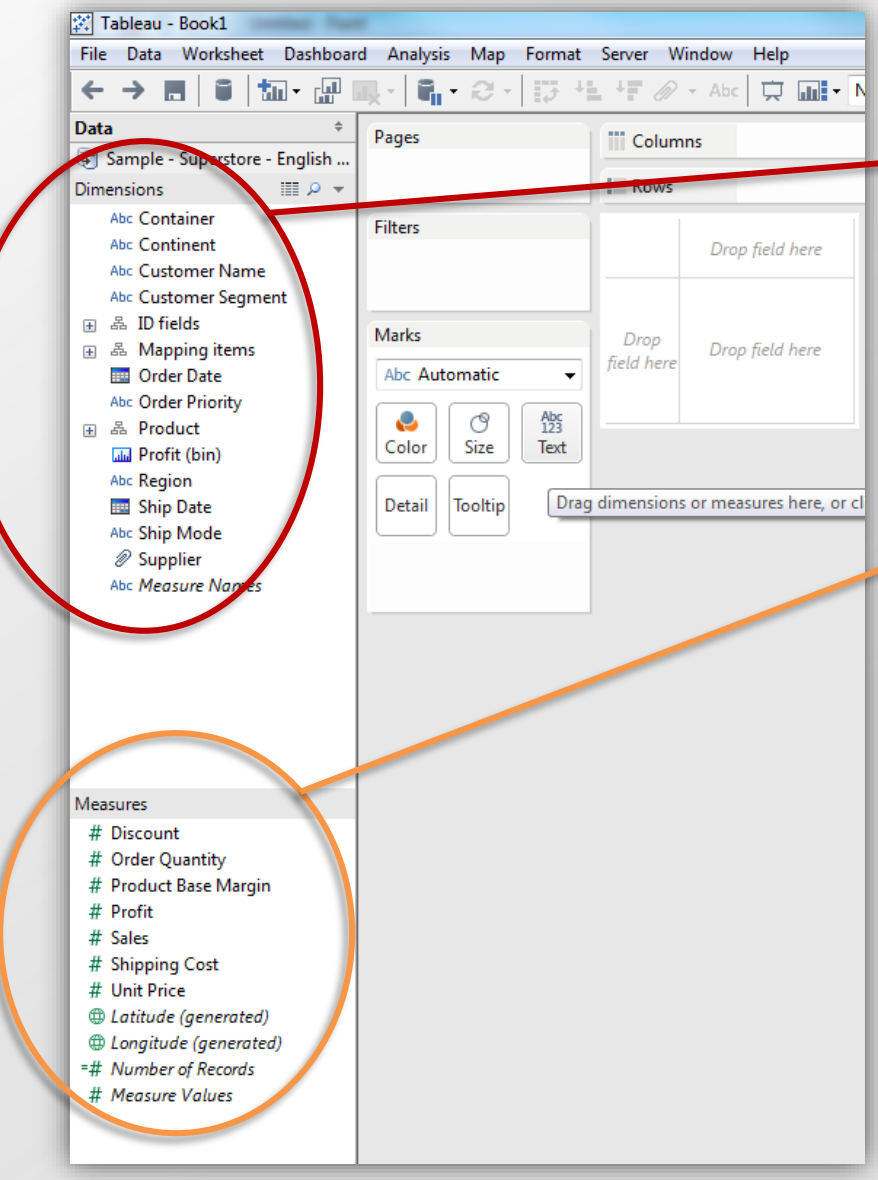
2014-01-02	2014	1	2	ǂ	8.5000	-10.0000	-0.8000	null	18.8000	null	0.00000
2014-01-03	2014	1	3	ǂ	3.0000	-11.0000	-4.0000	null	22.0000	null	0.00000
2014-01-04	2014	1	4	ǂ	-11.0000	-21.9000	-16.5000	null	34.5000	null	0.00000
2014-01-05	2014	1	5	ǂ	-14.4000	-25.5000	-20.0000	null	38.0000	null	0.00000
2014-01-06	2014	1	6	ǂ	3.4000	-14.8000	-5.7000	null	23.7000	null	0.00000
2014-01-07	2014	1	7	ǂ	-3.0000	-9.9000	-6.5000	null	24.5000	null	0.00000
2014-01-08	2014	1	8	ǂ	5.8000	-11.4000	-2.8000	null	20.8000	null	0.00000

Data



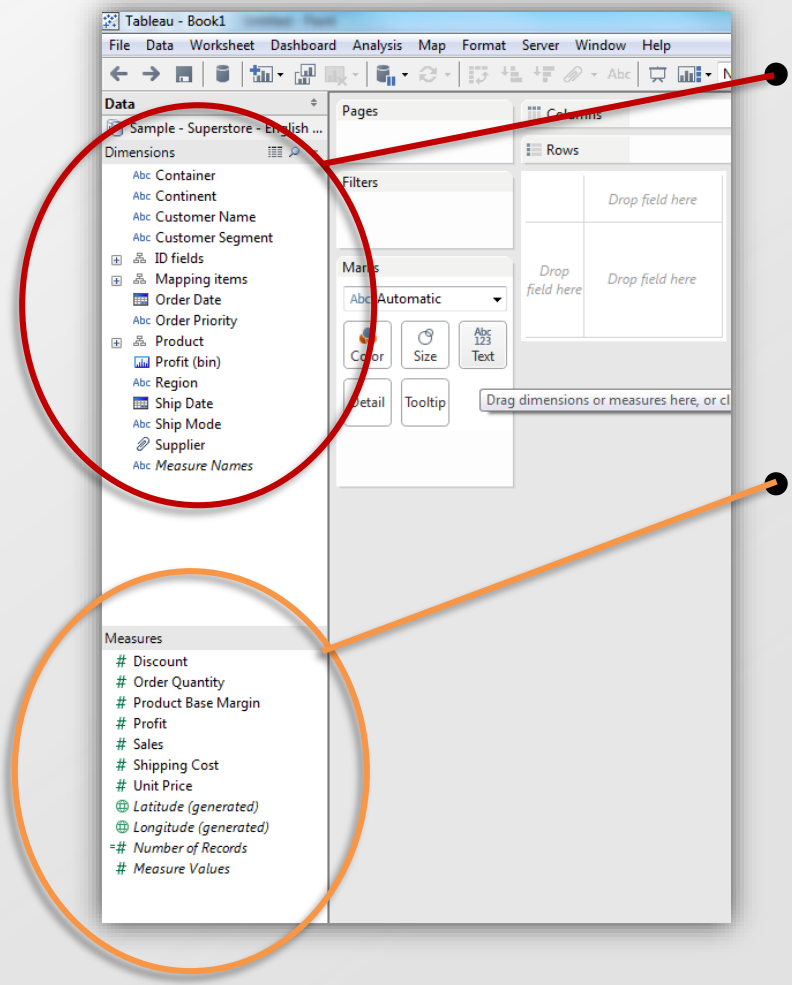
- Dimensions:
  - These are items that we might want to categorize our data by.
- Measures:
  - The numbers & metrics that we want to analyze.

2. How to Load Data

- File
- Database
- Online Source

- Import all at once
- Or connect "live" . . . Tableau will use latest values.

3. Interactive Visualizations



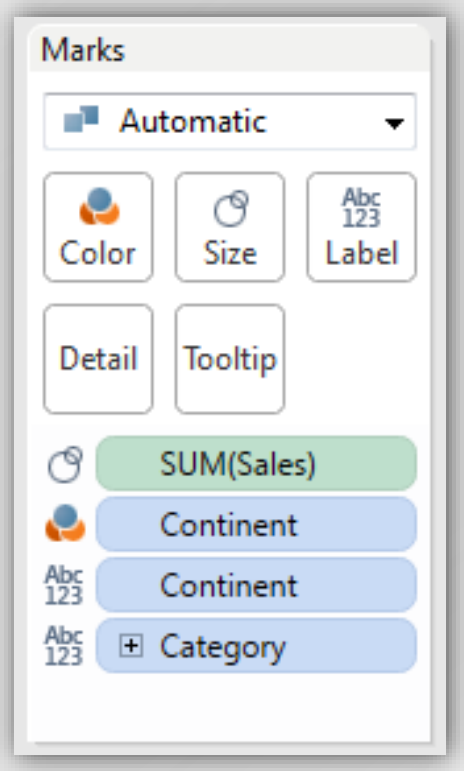
- Dimensions:
  - These are items that we might want to categorize our data by.
- Measures:
  - The numbers & metrics that we want to analyze.

Pick a Visualization

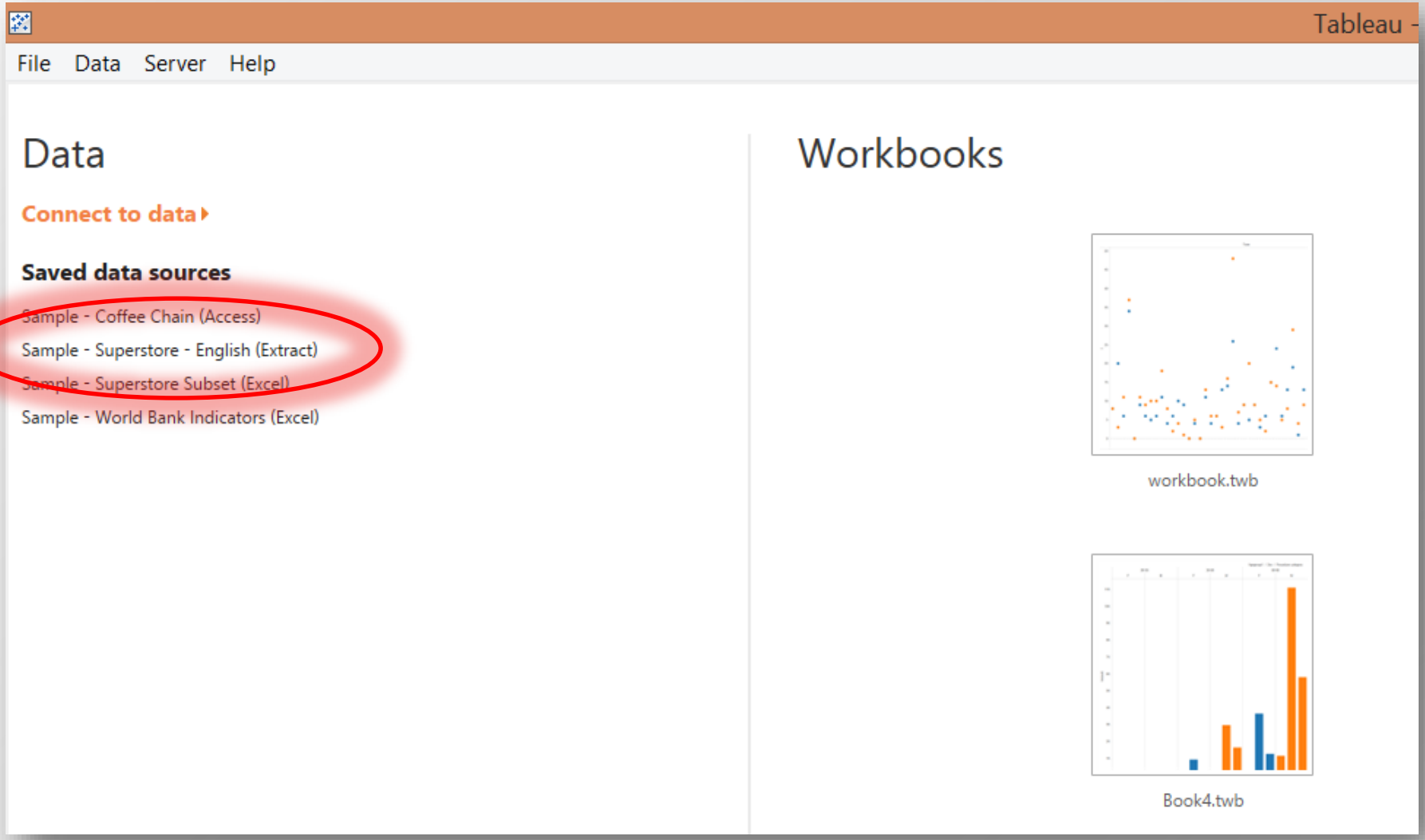
- Show Me Window
- Highlights valid alternatives
- Also can Ctrl-click dimensions & measures to get "Show Me" alternatives

Marks

- Map measure/dimension to different type of visual variable
  - Color/shade (when categorical vs ordered)
  - Size
  - Label
  - Detail
  - Tooltip
- Click to customize each element



Visualizations



Visualizations

- Drag & drop
  - Order Date (columns) & # of Records (rows)
- See your data (details & table)
- Tableau likes to add things up
- Menus / little triangles
- Forward / back buttons
- Break down dates

Visualizations

- Show Me Window
- Highlights valid alternatives
- Also can Ctrl-click dimensions & measures to get "Show Me" alternatives

Marks

- Map measure/dimension to different type of visual variable
  - Color/shade (when categorical vs ordered)
  - Size
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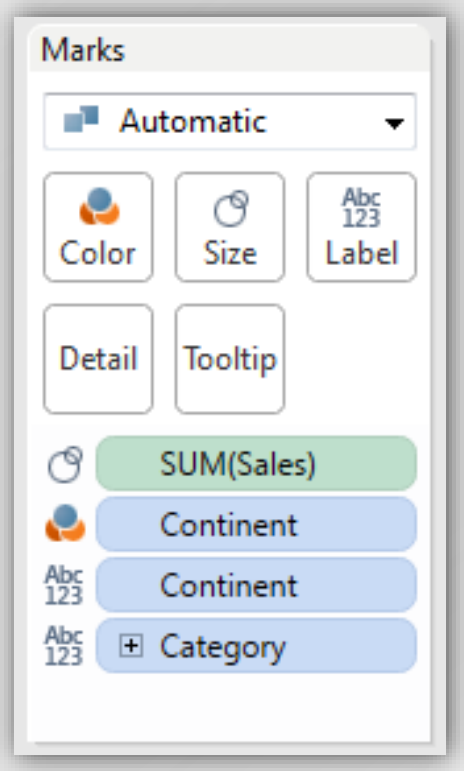


Output

- PDF / Screenshot
- Tableau workbook (can be read in free reader)
- Create an interactive webpage
  - Public
  - Server license

Plan for Today

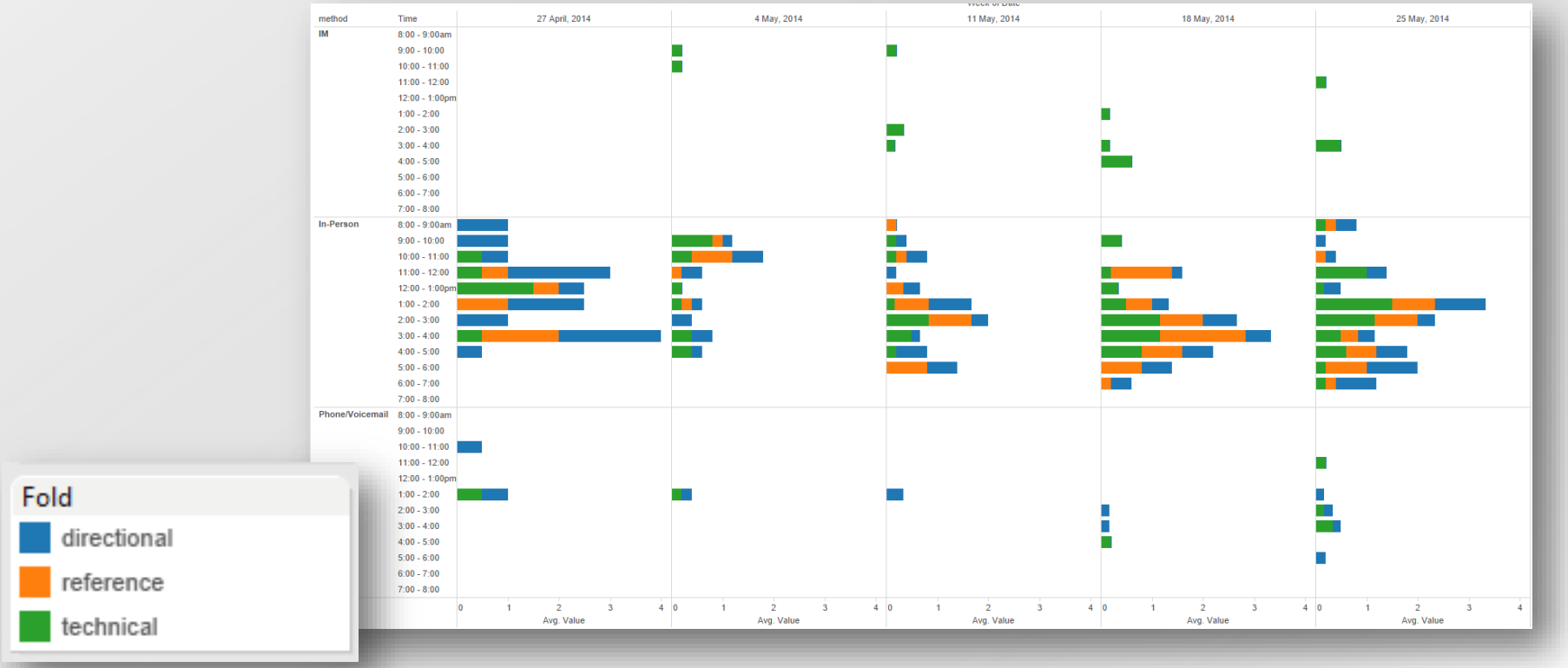
- 9:00 Intro
- 9:30 Visual Variables
- 11:00 Break
- 11:15 Vis Software & Tools
- 12:00 Lunch
- 1:00 Vis in the Library
- 1:30 Tableau
- 2:00 Break
- 2:15 Tableau Examples
- 3:00 Vis & Librarians' Profession Practice
- 3:30 Wrap-up

http://bit.ly/aladatavisworkshop

http://bit.ly/aladatavisworkshop

Examples

- Business Library – Interaction Counts
- Original data: BUSINESSLIB.xlsx
- Wrangled data: businesslib.csv

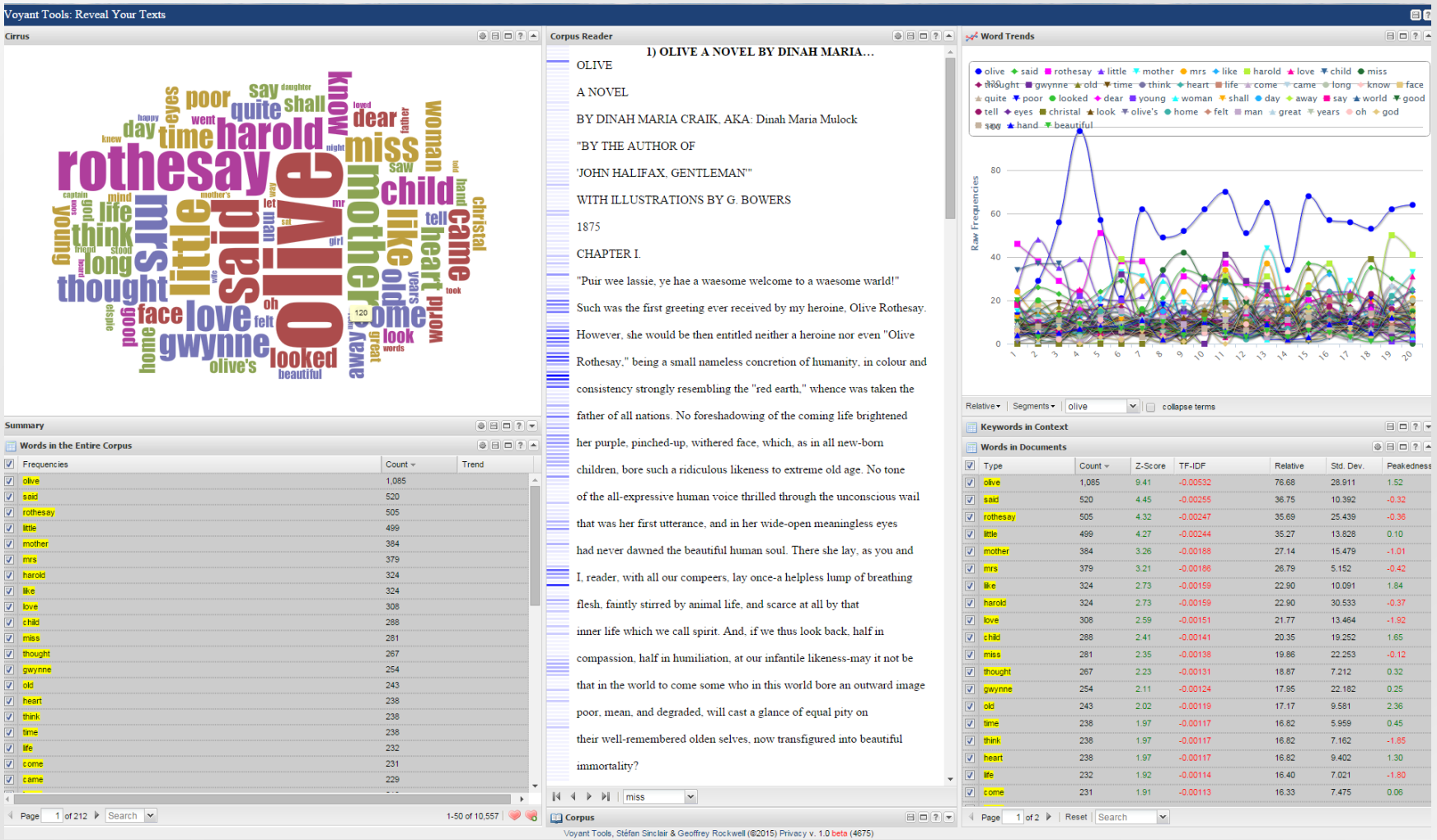


Voyant

http://bit.ly/aladatavisworkshop

olivewordfrequencies_raw.csv

olivewordfrequencies_wrangled.csv



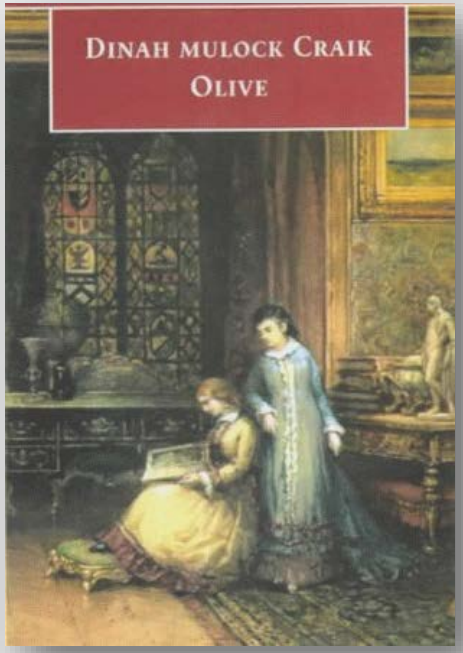
Voyant

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1	document	term	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
2	1	olive	19	29	56	98	57	21	62	49	52	62	70	51	65	34	68	57	56	53	62	64
3	2	said	20	26	23	19	24	29	15	21	34	31	28	27	22	22	37	33	20	35	30	24
4	3	rothesay	46	38	29	24	51	38	38	14	31	26	37	28	25	12	20	17	13	11	3	4
5	4	little	26	48	35	39	21	20	22	32	12	25	32	17	25	14	25	24	24	14	19	25
6	5	mother	15	15	9	14	20	33	31	17	19	13	20	10	44	17	10	3	29	10	22	33
7	6	mrs	24	14	14	15	17	19	29	12	24	13	34	7	37	8	27	17	11	20	16	21
8	7	like	14	16	10	12	21	14	7	19	14	17	28	14	16	19	23	32	11	14	13	10
9	8	harold	0	0	0	0	1	39	9	1	5	0	31	17	31	16	26	37	9	11	50	41
10	9	love	9	9	13	25	14	10	8	10	9	12	3	9	23	26	20	22	23	19	13	31
11	10	child	34	37	37	10	15	4	14	9	10	30	11	12	24	1	1	3	12	12	7	5
12	11	miss	6	2	1	8	5	9	14	34	42	30	29	20	8	13	23	12	12	9	4	0
13	12	thought	7	6	14	16	16	17	13	16	12	15	9	7	15	14	17	19	17	7	22	8
14	13	gwynne	0	0	0	0	9	32	5	3	9	0	41	29	27	15	14	9	13	17	15	16
15	14	old	13	8	17	11	10	12	12	8	10	16	14	17	5	9	35	11	9	3	10	13
16	15	time	9	15	19	16	12	11	10	6	8	14	7	9	12	12	10	13	15	8	14	18
17	16	think	10	4	4	17	7	13	8	7	8	9	11	17	17	14	9	24	15	15	14	15
18	17	heart	11	13	7	14	9	7	7	9	7	9	5	12	13	10	12	24	12	13	19	25
19	18	life	13	3	13	16	7	12	11	11	9	6	6	9	13	20	11	20	15	7	15	15
20	19	come	9	11	11	6	10	13	5	12	10	11	9	10	14	17	14	16	5	10	27	11
21	20	came	6	11	13	10	13	12	6	6	8	11	13	8	18	7	15	12	13	9	26	12
22	21	long	4	7	12	8	14	9	5	7	8	11	11	8	9	14	18	13	16	9	15	20
23	22	know	6	6	2	10	9	13	10	10	12	11	11	21	7	16	7	15	13	22	10	7
24	23	face	11	18	13	8	7	6	4	4	10	11	13	9	11	5	15	15	6	10	14	16
25	24	quite	7	7	5	18	13	4	9	12	14	18	17	12	10	10	10	11	9	7	6	6
26	25	poor	13	9	12	9	17	6	6	18	5	9	9	16	2	2	9	13	11	21	10	6
27	26	looked	5	20	12	14	8	8	16	6	6	12	7	9	12	5	7	14	4	7	11	15
28	27	dear	5	10	7	16	5	5	10	12	11	11	11	3	5	6	20	9	12	16	10	8
29	28	young	18	9	8	22	10	20	5	11	15	11	11	4	5	10	9	6	6	7	1	2
30	29	woman	12	4	6	5	12	8	5	29	11	10	5	14	2	12	7	12	4	8	7	3
31	30	shall	12	4	4	4	8	11	9	5	8	10	9	9	7	20	4	8	7	12	11	13
32	31	day	6	9	11	5	5	7	11	15	6	10	6	3	6	8	17	9	8	6	15	11
33	32	away	8	8	11	2	16	7	4	5	6	10	7	5	8	11	17	9	10	8	13	7
34	33	say	18	10	6	7	4	6	9	5	4	12	8	14	10	9	4	10	7	9	9	10
35	34	world	9	4	9	6	8	7	10	9	4	6	6	6	7	14	7	12	13	7	11	14
36	35	good	10	4	3	5	6	6	4	8	16	8	3	18	9	4	11	10	7	12	6	14

DataWrangler

- http://vis.stanford.edu/wrangler/app

Example

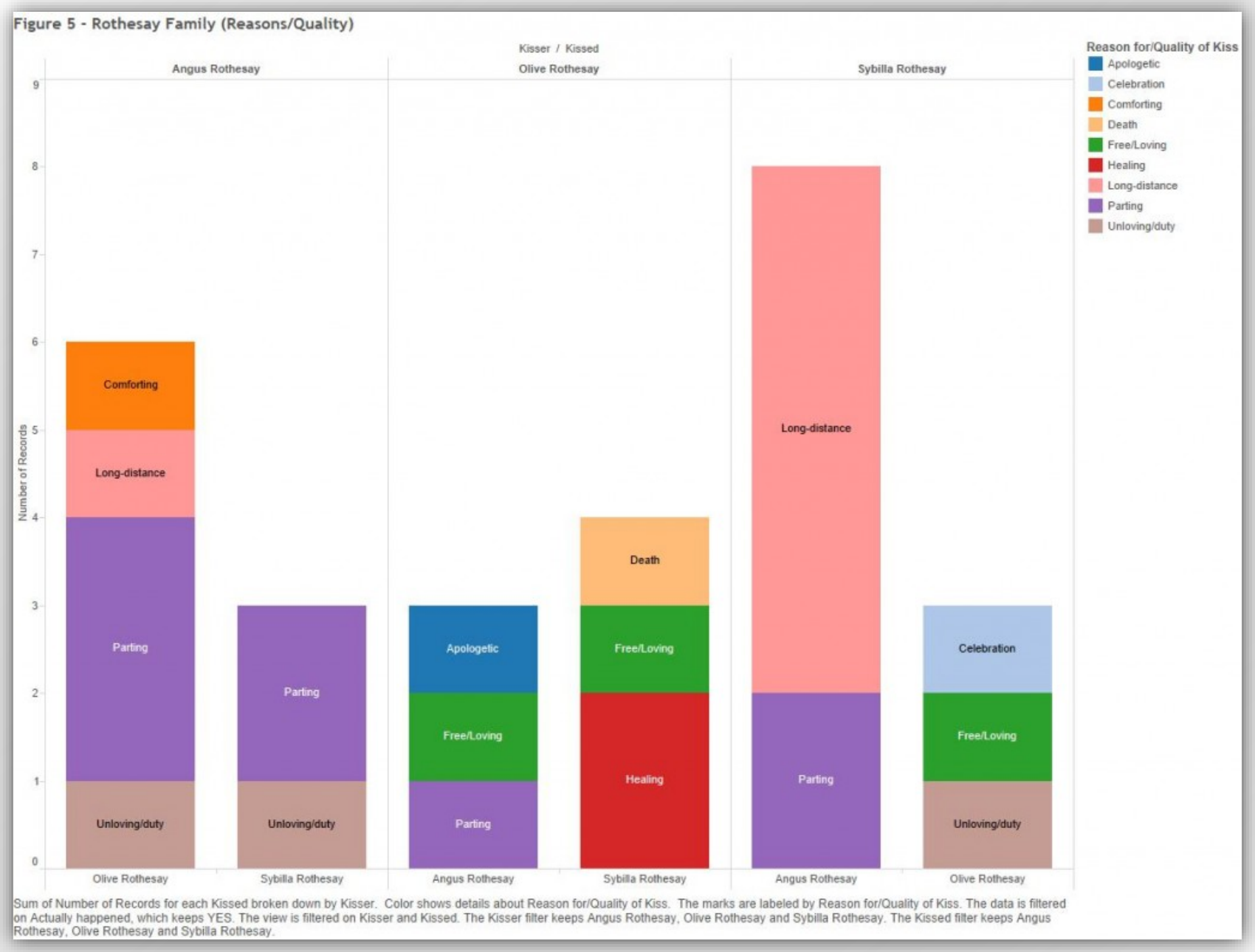


- Aaron Ellsworth (MA student)
- Olive by Dinah Craik

- Assignment: compile data from a novel
  - Kisses

1	Kissed	Type of Relationship	Chapter	Requested by	Actually happened	Body Part Kissed	son for/Quality of	Gender Mix	Race of Kisser	Race of Kissed	Same Race?	Location	Iteration/Single
15	Angus Rothesay	Parent-Child	5	N/A	YES	Lips	Free/Loving	F-M	Celt-Saxon Mix	Celt	NO	Rothesay home [Stirling]	Multiple
16	Olive Rothesay	Parent-Child	5	N/A	YES	Lips	Parting	M-F	Celt	Celt-Saxon Mix	NO	Rothesay home [Stirling]	Single
17	Angus Rothesay	Spouse	6	N/A	YES	Lips	Parting	F-M	Saxon	Celt	NO	Rothesay home [Stirling]	Iteration
18	Infant Brother Rothesay	Sibling	7	N/A	YES	Lips	Free/Loving	F-M	Celt-Saxon Mix	Celt-Saxon Mix	YES	Rothesay home [Merivale	Single
19	Olive Rothesay	Caretaker-Child	8	N/A	NO	Lips	Death	F-F	Celt	Celt-Saxon Mix	NO	Rothesay home [Merivale	Hypothetical/Reciprocal?
20	Olive Rothesay	Parent-Child	10	N/A	YES	Lips	Comforting	M-F	Celt	Celt-Saxon Mix	NO	Rothesay home [Merivale	Single
21	Olive Rothesay	Parent-Child	10	N/A	YES	Lips	Parting	M-F	Celt	Celt-Saxon Mix	NO	Rothesay home [Merivale	Single
22	Sybilla Rothesay	Spouse	10	Olive Rothesay	NO	Lips	Greeting	M-F	Celt	Saxon	NO	Rothesay home [Merivale	Unknown
23	First [Girl]Friend	Friends	11	N/A	NO	love-letters	N/A	F-F	N/A	N/A	?	Hypothetical	Hypothetical/Reciprocal?

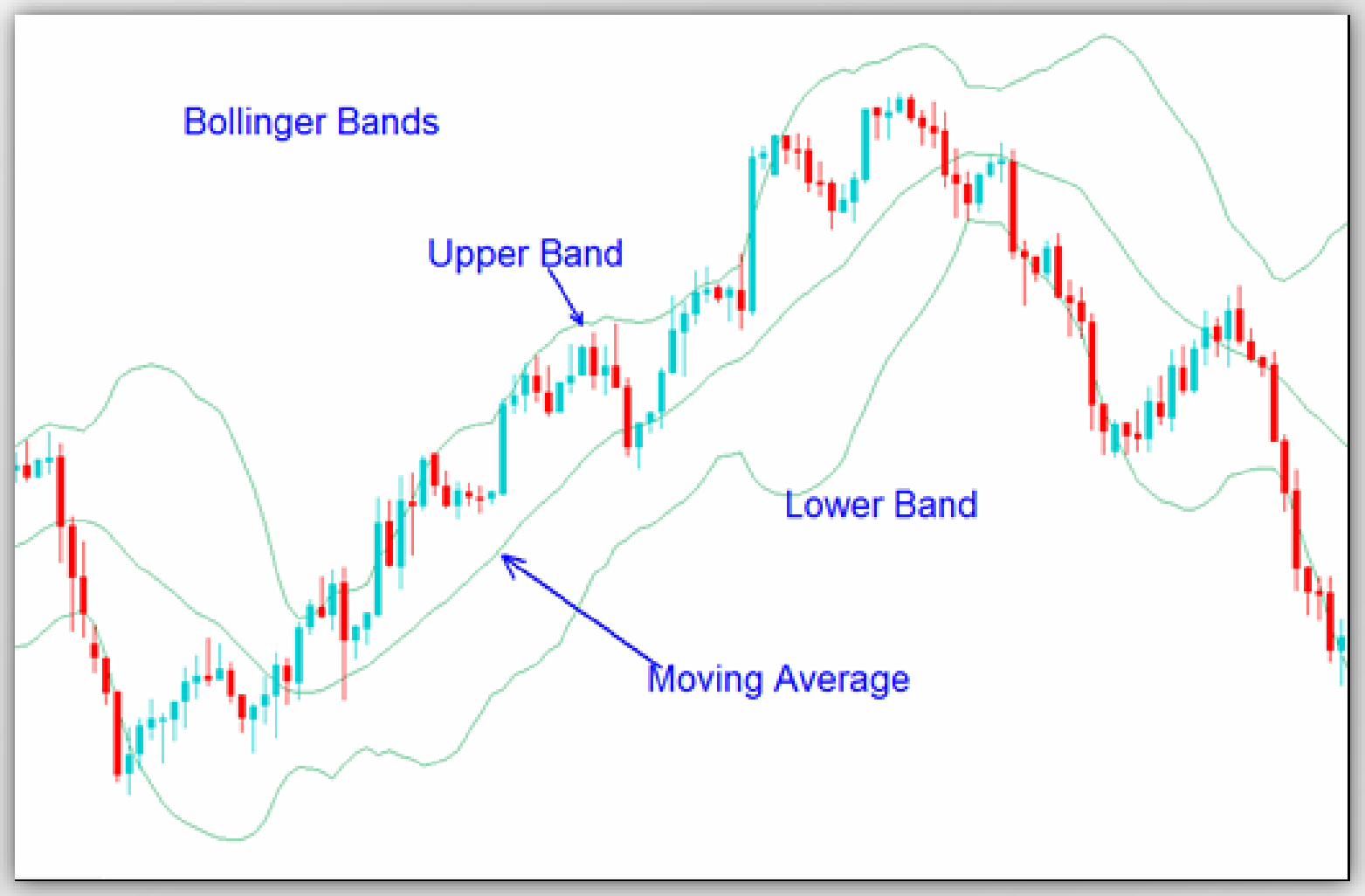
http://aaronellsworth.ca



http://aaronellsworth.ca

http://aaronellsworth.ca

Bollinger Bands



http://libdev.ucalgary.ca/brosz/applestock.csv

Bollinger Bands

- Add data file (Apple)
- Make rows Close for each
- Create moving average calculated field
- window_avg(avg([Close]),-[Period],0)
- window_stdev(avg([Close]),-[Period],0)

More Info

- Training videos
  - http://www.tableausoftware.com/learn/training
- Tableau Visualization of the Day
  - http://www.tableausoftware.com/public/community/viz-of-the-day

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