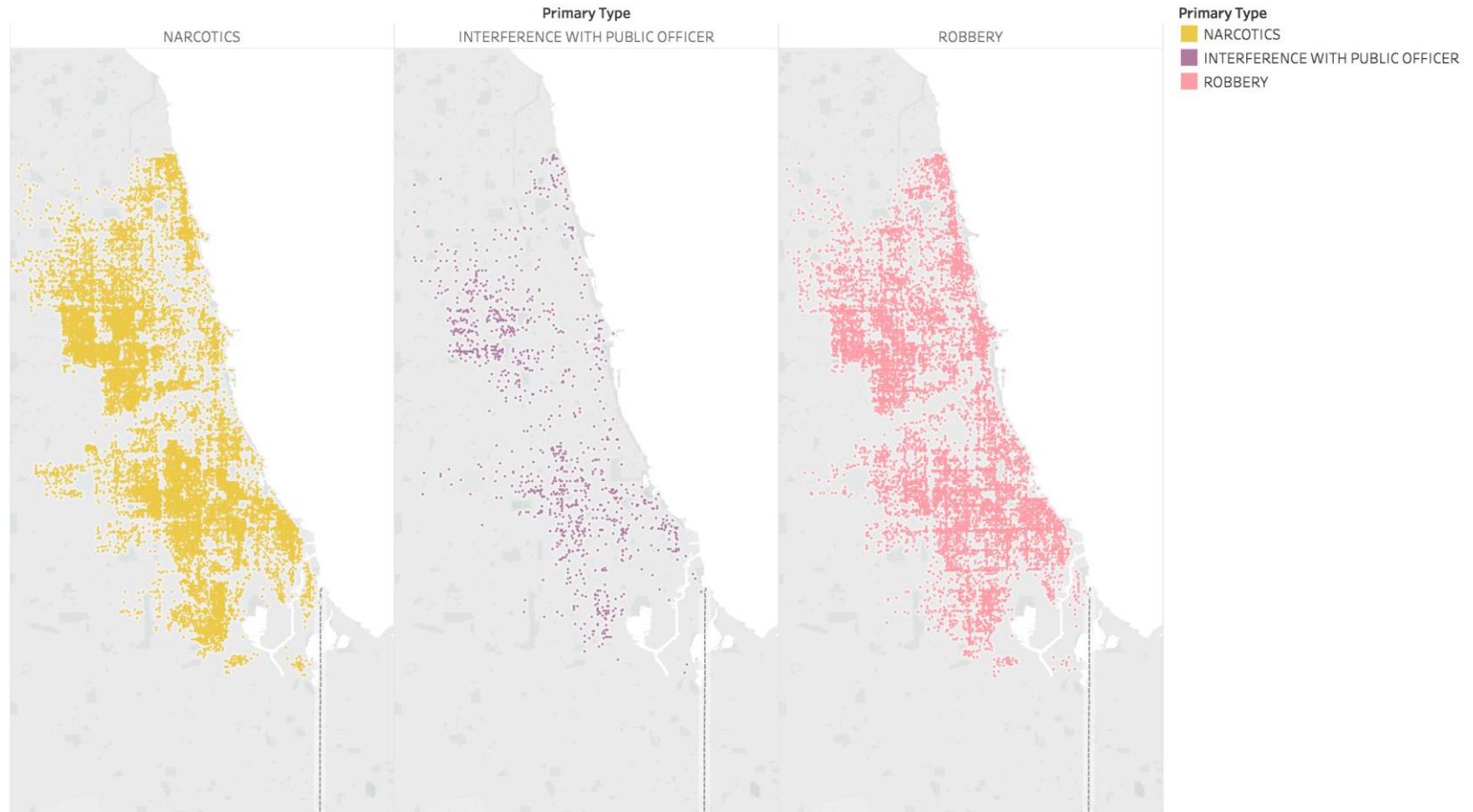# Tableau Tutorial

What is Tableau?

Tableau is an application used to **create visualizations** and to **conduct data analysis**.

Example Exploratory Analysis: Chicago Crimes

Crimes by Area (2)

Map based on Longitude and Latitude broken down by Primary Type. Color shows details about Primary Type. The view is filtered on Primary Type, which keeps INTERFERENCE WITH PUBLIC OFFICER, NARCOTICS and ROBBERY.

Data Set

ID	Case Number	Date	Block	IUCR	Primary Type	Description
11094302	JA440000	09/20/2017 11:50:00 PM	035XX N BROADWAY	0860	THEFT	RETAIL THEFT
11094328	JA440002	09/20/2017 11:50:00 PM	010XX W THORNDALE AVE	0320	ROBBERY	STRONGARM - NO WEAPON
11094548	JA440240	09/20/2017 11:45:00 PM	001XX S CLINTON ST			$500 AND UNDER
11094326	JA439988	09/20/2017 11:44:00 PM	076XX S KINGSTON AVE	1320	CRIMINAL DAMAGE	TO VEHICLE
11094351	JA440021	09/20/2017 11:43:00 PM	014XX W JARVIS AVE	0340	ROBBERY	ATTEMPT: STRONGARM-NO WEAP
11099631	JA439993	09/20/2017 11:43:00 PM	064XX S BISHOP ST	0486	BATTERY	DOMESTIC BATTERY SIMPLE
11094304	JA439999	09/20/2017 11:42:00 PM	078XX S JEFFERY BLVD	031A	ROBBERY	ARMED: HANDGUN
11094345	JA439985	09/20/2017 11:41:00 PM	033XX N PULASKI RD	0291	CRIM SEXUAL ASSAULT	ATTEMPT NON-AGGRAVATED
11094316	JA439984	09/20/2017 11:40:00 PM	018XX W 18TH ST	0486	BATTERY	DOMESTIC BATTERY SIMPLE
11094402	JA440017	09/20/2017 11:39:00 PM	029XX W 60TH ST	0820	THEFT	$500 AND UNDER
11094331	JA439998	09/20/2017 11:35:00 PM	068XX S WOLCOTT AVE	0486	BATTERY	DOMESTIC BATTERY SIMPLE

Showing 6,438,420 out of 6,438,420 Reported Crimes

Crimes - 2001 to present - Dashboard | City of Chicago | Data Portal

Reported Crimes 1-11 out of 6,438,420

Tableau – Tips for Working with Your Data: http://onlinehelp.tableau.com/current/pro/desktop/en-us/data_tips.html

Dimensions

- Usually discrete categorical information (e.g. year, zip code)
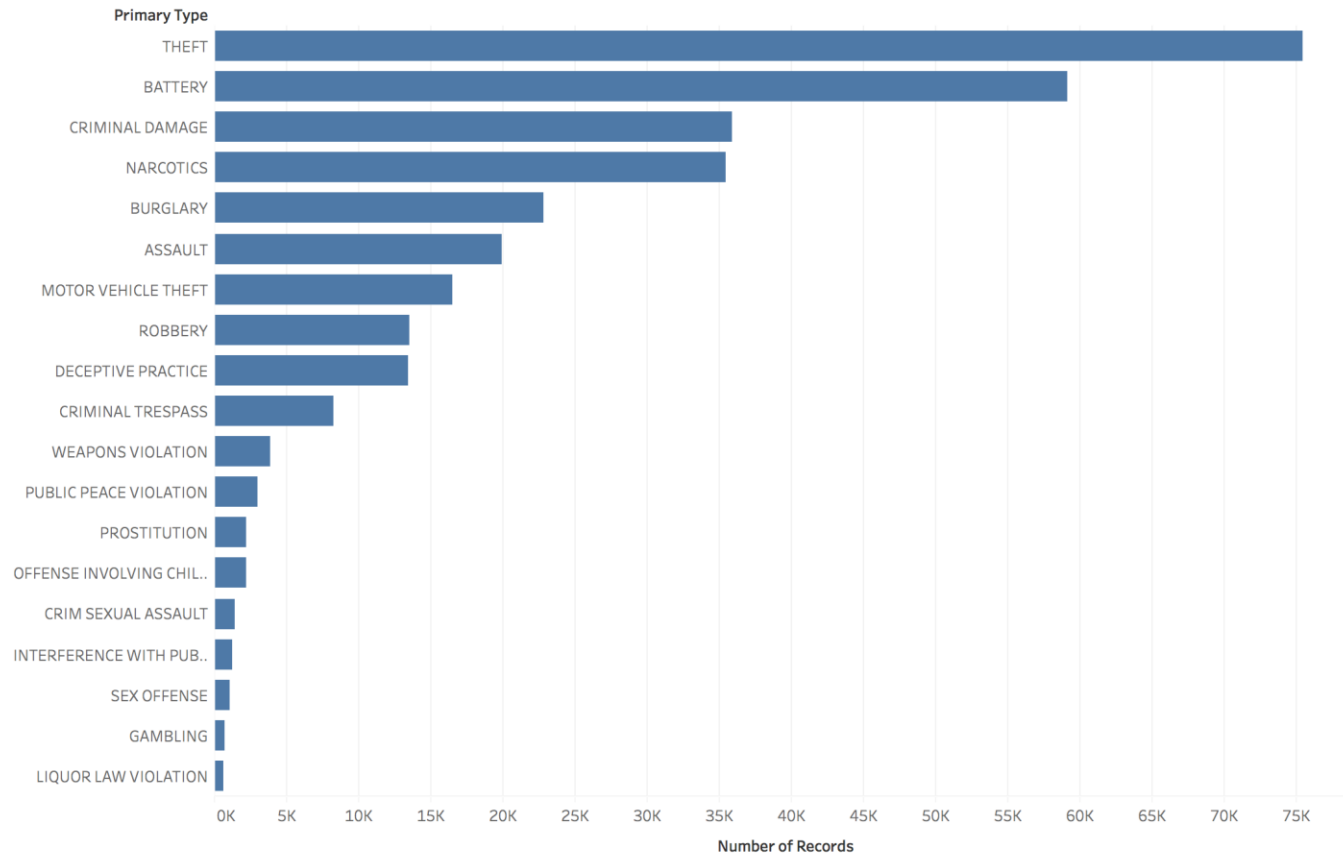- Tableau creates column or row headers for each of your dimensions

Measures

- Usually quantitative and numerical information (e.g. scores, prices)
- Tableau creates a continuous axis
- You can apply aggregations onto these measures (Sum, average, count etc…)

Both dimensions and measures can be discrete and continuous variables (except for Strings and Booleans)
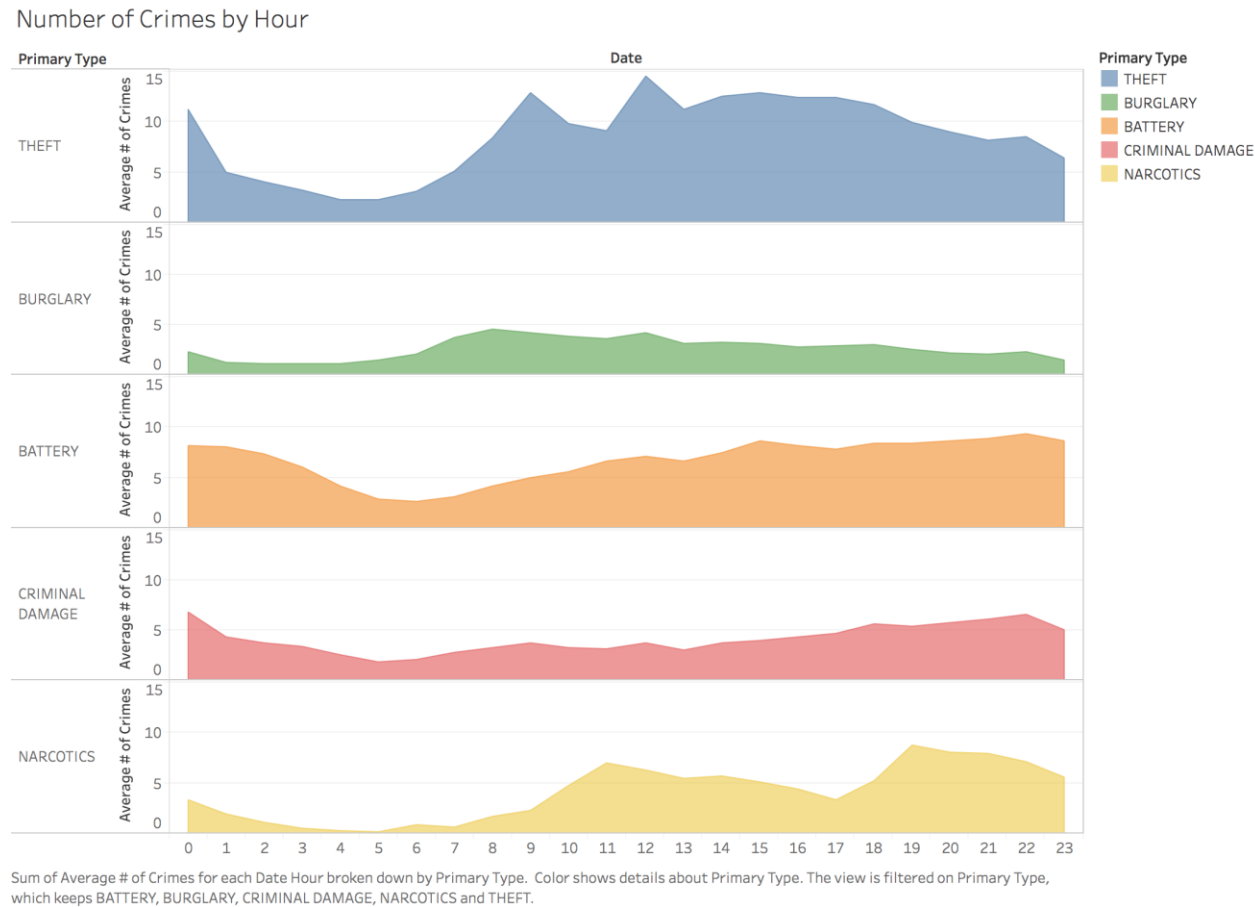
Basic sorting, aggregation, and filtering example

Number of Crimes by Type

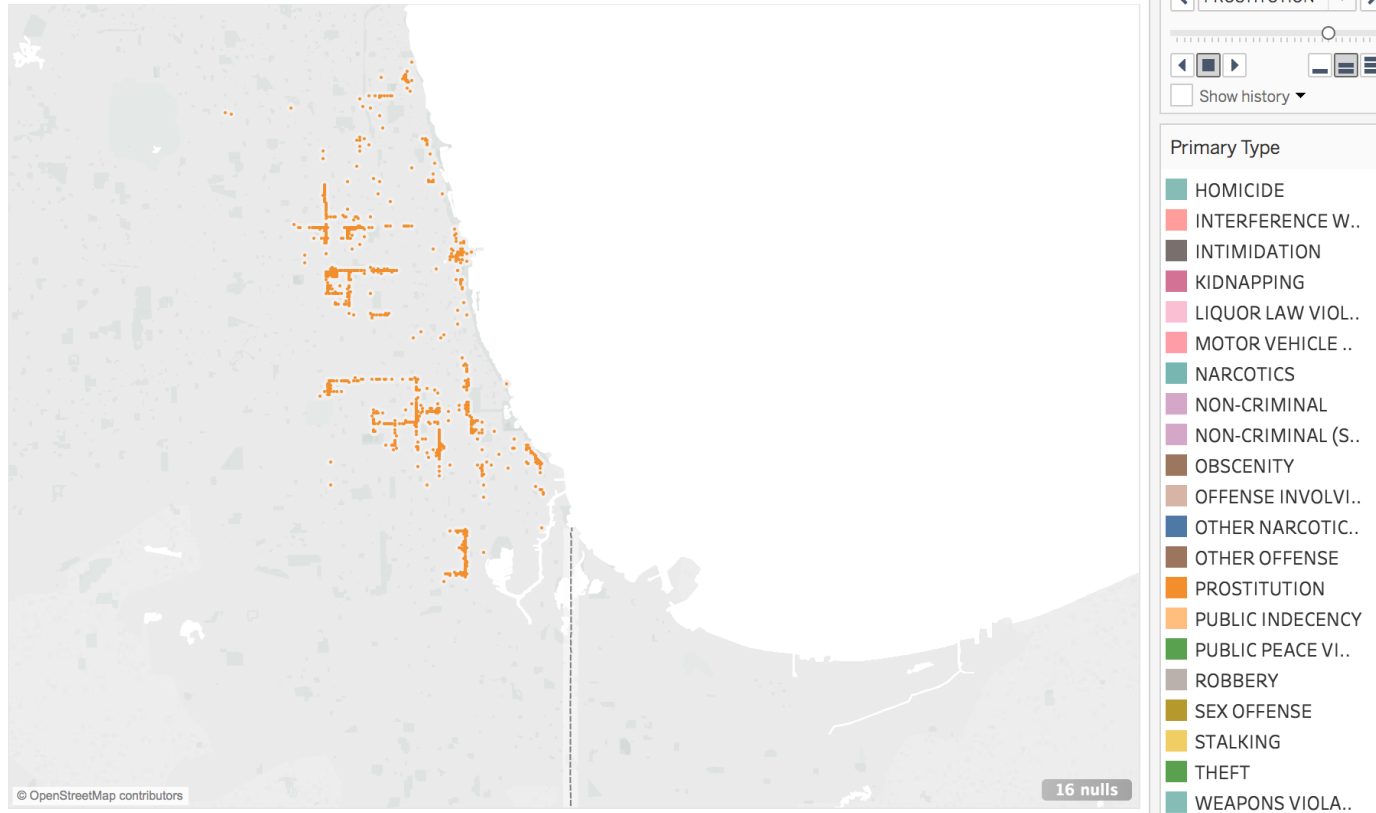What are the most common crimes in Chicago?

Applying color, creating formulas, other types of visualizations

How does the time of day influence crime rates?

Longitude, latitude, marks, and pages example

How do the crime patterns relate to the geography of Chicago? Are there areas that are known for specific kinds of crimes?

Review

- Remove aggregated data and blank rows
- Add header columns
- Flatten hierarchical headers

Flatten hierarchical headers to a single row

In general, Tableau Desktop expects only the first row in your Excel data to contain column headers. Data that contains multiple layers of column headers can cause problems during your analysis.

For example, suppose you have a table that contains one major header and multiple sub-headers.

California					
ID	**Gender**	**School**	**Math**	**Science**	**History**
1	M	West	90	80	80
2	F	South	50	50	50
3	M	Central	50	80	80
4	M	Central	100	90	80
5	F	West	90	100	80

In this case, the hierarchy of headers must be flattened or removed. To do this, you can manually create a new column for each header in the hierarchy directly in your Excel data. Alternatively, connect to your Excel data from Tableau Desktop and then turn on Data Interpreter. Verify that your headers are flattened correctly. For more information about Data Interpreter, see Clean Your Data with Data Interpreter.

ID	**State**	**Gender**	**School**	**Math**	**Science**	**History**
1	California	M	West	90	80	80
2	California	F	South	50	50	50
3	California	M	Central	50	80	80
4	California	M	Central	100	90	80
5	California	F	West	90	100	80

Review

Tableau will automatically generate dimensions, measures, and types but most are editable

| # | Abc | | Abc | # | Abc | Abc | Abc | T\|F |
| Crimes_-_20... | Crimes_-_2001_to_present.... | Crimes_-_2001_to_present.csv | Crimes_-_2001_to_present.csv | Crimes_-_2... | Crimes_-_2001_to_present.csv | Crimes_-_2001_to_present.csv | Crimes_-_2001_to_present.csv | Crimes_-_2001_to... |
ID	**Case Number**	**Date**	**Block**	**Iucr**	**Primary Type**	**Description**	**Location Descripti...**	**Arrest**
10433096	HZ170962	1/1/12 12:00:00 AM	026XX N MC VICKER ...	1,562	SEX OFFENSE	AGG CRIMINAL SEXU...	RESIDENCE	True
10433124	HZ170983	1/1/12 12:00:00 AM	026XX N MC VICKER ...	1,544	SEX OFFENSE	SEXUAL EXPLOITATIO...	RESIDENCE	True
10520780	HZ262685	4/13/12 12:00:00 AM	064XX S DR MARTIN ...	1,154	DECEPTIVE PRACTICE	FINANCIAL IDENTITY ...	APARTMENT	False
10521090	HZ262624	8/12/12 12:00:00 PM	027XX S CHRISTIANA...	1,563	SEX OFFENSE	CRIMINAL SEXUAL A...	RESIDENCE	False
10521199	HZ262885	2/13/12 7:00:00 PM	070XX S WESTERN A...	1,130	DECEPTIVE PRACTICE	FRAUD OR CONFIDE...	OTHER	False
10486358	HZ226158	6/1/12 12:00:00 PM	017XX N SPRINGFIEL...	281	CRIM SEXUAL ASSAULT	NON-AGGRAVATED	RESIDENCE	False
10486424	HZ226240	11/1/12 9:00:00 AM	073XX N HARLEM AVE	1,153	DECEPTIVE PRACTICE	FINANCIAL IDENTITY ...	RESIDENCE	False
10528383	HZ270974	7/9/12 9:00:00 AM	071XX S SANGAMON ...	1,153	DECEPTIVE PRACTICE	FINANCIAL IDENTITY ...	RESIDENCE	False
10541258	HZ286800	5/28/12 9:00:00 AM	009XX E 84TH ST	1,120	DECEPTIVE PRACTICE	FORGERY	APARTMENT	False
8707009	HV383537	7/14/12 3:00:00 PM	041XX N MENARD AVE	1,750	OFFENSE INVOLVING...	CHILD ABUSE	RESIDENCE	False
8747421	HV422446	8/8/12 5:30:00 PM	029XX S POPLAR AVE	810	THEFT	OVER $500	STREET	False

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