Tutorial for mapping Toronto's 2013 fire hydrant parking ticket data

<u>Toronto</u>, like cities including <u>Vancouver</u>, <u>Edmonton</u>, <u>Ottawa</u> and <u>Halifax</u>, has an open data site with lots of great data to download. The data sets include restaurant inspections, names of lobbyists, and parking data.

The Canadian Press' <u>Steve Rennie</u> produced an interesting story about the address where motorists received the highest number of tickets for parking too close to a fire hydrant during the years 2008 and 2013.

You can see the online story and video by clicking <u>here</u>.

If the link is broken, please click <u>here</u> for a PDF version of the story.

For the purposes of this tutorial, we won't be downloading the data sets for 2008 to 2014.

Instead, we'll just focus on one year. Because each year contains slightly more than two million records, you won't be able to download the entire data set in Excel 2007 or the more recent versions since they have a limit of one million records.

If you already know how to use the data base manager, Access, or MyQL or SQL Server, then you can work with the entire data set, just like Steve did.

If you want to use Excel just for the purposes of conducting the exercise, then you'll only be working with half the data set, which will produce an inaccurate result.

What I've done with the file you're about to download is use Access to produce a new table that creates a new column that includes the city,

province and country which is necessary for Fusion Tables; filters for fire hydrant infractions; groups the infractions by address; and then filters for the top twenty sites.

Please download the file by clicking <u>here</u>. Save the file in a folder that's easy to find.

	А	В	С	D	E	F	G	Н
1	Hydrant_Count	Address	City_Province_Country	Addressfo	rFT			
2	609	393 UNIVERSITY AVE	Toronto, Ontario, Canada	393 UNIV	ERSITY AVE,	Toronto, C	Ontario, Car	nada
3	336	99 ATLANTIC AVE	Toronto, Ontario, Canada	99 ATLAN	TIC AVE, To	ronto, Onta	ario, Canad	а
4	285	33 ELMHURST AVE	Toronto, Ontario, Canada	33 ELMHU	RST AVE, T	oronto, On	tario, Cana	da
5	274	112 MERTON ST	Toronto, Ontario, Canada	112 MERT	ON ST, Toro	onto, Ontar	rio, Canada	
6	255	361 UNIVERSITY AVE	Toronto, Ontario, Canada	361 UNIV	ERSITY AVE,	Toronto, C	Ontario, Car	nada
7	242	21 GLEBE RD E	Toronto, Ontario, Canada	21 GLEBE	RD E, Toror	nto, Ontario	o, Canada	
8	218	56 THE ESPLANADE	Toronto, Ontario, Canada	56 THE ES	PLANADE, T	oronto, On	ntario, Cana	ida
9	205	6 SPRING GARDEN AVE	Toronto, Ontario, Canada	6 SPRING	GARDEN AV	/E, Toronto	, Ontario, C	anada
10	201	91 BELLEVUE AVE	Toronto, Ontario, Canada	91 BELLEV	UE AVE, To	ronto, Onta	ario, Canad	а
11	200	5519 YONGE ST	Toronto, Ontario, Canada	5519 YON	GE ST, Toro	nto, Ontari	o, Canada	
12	191	592 MARKHAM ST	Toronto, Ontario, Canada	592 MARK	HAM ST, To	oronto, Ont	ario, Canad	la
13	187	25 BELLEVUE AVE	Toronto, Ontario, Canada	25 BELLEV	UE AVE, To	ronto, Onta	ario, Canad	а
14	185	500 WELLINGTON ST W	Toronto, Ontario, Canada	500 WELL	NGTON ST	W, Toronto	o, Ontario,	Canada
15	174	5100 YONGE ST	Toronto, Ontario, Canada	5100 YON	GE ST, Toro	nto, Ontari	o, Canada	
16	167	17 LILLIAN ST	Toronto, Ontario, Canada	17 LILLIAN	I ST, Toront	o, Ontario,	Canada	
17	162	43 ELM ST	Toronto, Ontario, Canada	43 ELM ST	, Toronto, (Ontario, Ca	nada	
18	157	387 QUEEN ST W	Toronto, Ontario, Canada	387 QUEE	N ST W, Toi	ronto, Onta	rio, Canada	a
19	155	43 HANNA AVE	Toronto, Ontario, Canada	43 HANNA	AVE, Toro	nto, Ontario	o, Canada	
20	153	5460 YONGE ST	Toronto, Ontario, Canada	5460 YON	GE ST, Toro	nto, Ontari	o, Canada	
21	146	186 SPADINA AVE	Toronto, Ontario, Canada	186 SPADI	NA AVE, To	ronto, Onta	ario, Canad	а
22								

Your table should look like the screen grab below.

Top twenty works for two key reasons: we frequently tell stories using the top 10 or 20, and this is a reasonable number to map, which is possible because we're created a new address field that includes the city, province and country.

Upload the table to Fusion Tables.

Column names are	in row 1 👻				
1	Hydr	Address	City	Addr	1
2	609	393 UNIVERSITY AVE	Toronto, Ontario, Canada	393 UNIVERSITY AVE, Toronto, Ontario, Canada	
3	336	99 ATLANTIC AVE	Toronto, Ontario, Canada	99 ATLANTIC AVE, Toronto, Ontario, Canada	
4	285	33 ELMHURST AVE	Toronto, Ontario, Canada	33 ELMHURST AVE, Toronto, Ontario, Canada	
5	274	112 MERTON ST	Toronto, Ontario, Canada	112 MERTON ST, Toronto, Ontario, Canada	
6	255	361 UNIVERSITY	Toronto, Ontario,	361 UNIVERSITY	-
Rows before the head	er row will be ignored.				

Continue with the import until the table is fully loaded.

TopHydrantsforFT_Access

Imported at Tue Aug 12 19:05:33 PDT 2014 from TopHydrantsforFT_Access.xlsx. Edited at 11:09 PM

Eila Edit Taala		Cards 1	• Man of	City Province
			¥ Wap U	ony_1 tovince
Filter - No filt	ers applied			
🖲 🕚 1-20 of 2	20 🕑 🕪			
Hydrant_Count	Address	City_Province	_Country	AddressforFT
609	393 UNIVERSITY AVE	Toronto, Ontari	o, Canada	393 UNIVERSITY AVE, Toronto, Ontario, Canada
336	99 ATLANTIC AVE	Toronto, Ontari	o, Canada	99 ATLANTIC AVE, Toronto <mark>,</mark> Ontario, Canada
285	33 ELMHURST AVE	Toronto, Ontari	o, Canada	33 ELMHURST AVE, Toronto <mark>,</mark> Ontario, Canada
274	112 MERTON ST	Toronto, Ontari	o, Canada	112 MERTON ST, Toronto, Ontario, Canada
255	361 UNIVERSITY AVE	Toronto, Ontari	o, Canada	361 UNIVERSITY AVE, Toronto, Ontario, Canada
242	21 GLEBE RD E	Toronto, Ontari	o, Canada	21 GLEBE RD E, Toronto, Ontario, Canada
218	56 THE ESPLANADE	Toronto, Ontari	o, Canada	56 THE ESPLANADE, Toronto, Ontario, Canada
205	6 SPRING GARDEN AVE	Toronto, Ontari	o, Canada	6 SPRING GARDEN AVE, Toronto, Ontario,

You'll notice that FT has identified two address fields. We have to tell it which one to geocode. We'll use "AddressforFT" because it has the street address in addition to the city, province and country, details FT will use. In order to tell FT which address field to geocode, go to the "Edit" in the menu and select the "Change Columns" option.

Top Import Edited	DHydrantsforFT ted at Tue Aug 12 19:05:33 I at 11:09 PM	_Acc	ess from TopHy	ydrantsforFT_Acces	s.xlsx.		
File	Edit Tools Help	Ro	ws 1 👻	E Cards 1	• Map of	f City_Province	+
Filt	Add row						
	Edit row						
Hydi	Duplicate row			City_Province	_Country	AddressforFT	
	Delete selected rov	v	Y AVE	Toronto, Ontar	io, Canada	393	
	Delete all rows					AVE, Toronto,	
	Add column				Province_Country AddressforFT nto, Ontario, Canada 393 UNIVERSITY AVE, Toronto, Ontario, Canada nto, Ontario, Canada 99 ATLANTIC AVE, Toronto, Ontario, Canada		
	Add formula colum	n	/E	Toronto, Ontar	io, Canada	99 ATLANTIC	
(Change columns	>				AVE, Toronto, Ontario, Canada	
	285 33 ELM	HURST	AVE	Toronto, Ontar	io, Canada	33 ELMHURST AVE, Toronto, Ontario,	

Select the "City_Province_Country" field.

Hydrant_Count Address	Number Text	Name
City_Province_Country	₩¥×	City_Province_Country
AddressforFT	Location	Description
		Data entry Learn more

You'll notice that FT has identified it as a "Location" type (which is why it's in yellow). We want to change it to "Text".

Тор	Hydra	antsforFT	Access
			and the second s

ools Help	🔤 Rows 1 🔻	E Cards 1	Map of City_P	rovince			
lo filters appli	ed						
20 of 20 🕒)+-				Change solumne		
unt Addres	ŝs	City_Province	_Country Addre	ssforFT	Change columns		
609 393 UN	IIVERSITY AVE	Teronto, Ontai	io, Canada 393 UNIVE AVE.	RSITY Foronto,	Hydrant_Count Address	Number Text	Name
			Ontari Canad	a.	City_Province_Country	t V	City_Province_Country
336 99 ATL	ANTIC AVE	Toronto, Ontai	io, Canada 99 AT AVE, Ontari Canad	ANTIC Toronto 9. a	AddressforFT	Location	Description
285 33 ELN	IHURST AVE	Toronto, Ontar	io, Canada 33 ELMH AVE Ontari Canad	URST Foronto, 5, a		(Type Text 💠
274 112 ME	ERTON ST	Toronto, Ontai	tio, Canada 112 M ST, To Ontari Canad	ERTON ronto, o, a			None 🗢 Data entry Learn more
255 361 UN	IVERSITY AVE	Toronto, Ontai	io, Canada 361 UNIVE AVE Ontari Canad	RSITY Foronto 2, a			Ualidate data List of drop-down items
242 21 GLE	BE RD E	Toronto, Ontai	io, Canada 21 GL E, Tor Ontari Canad	EBE RD onto, o, a			
218 56 THE	ESPLANADE	Toronto, Ontai	io. Canada 56 TH ESPL Toront Ontari	E ANADE 0,	Save	1	

There is no need to touch the second address field because FT has already identified it as a location. So just save the result.

Filter 👻	No filters applied
----------	--------------------

🕅 🖪 1-20 of 20 🕩 👀

Hydrant_Count	Address	City_Province_Country	AddressforFT
609	393 UNIVERSITY AVE	Toronto, Ontario, Canada	393 UNIVERSITY AVE, Toronto, Ontario, Canada
336	99 ATLANTIC AVE	Toronto, Ontario, Canada	99 ATLANTIC AVE, Toronto, Ontario, Canada
285	33 ELMHURST AVE	Toronto, Ontario, Canada	33 ELMHURST AVE, Toronto, Ontario, Canada
274	112 MERTON ST	Toronto, Ontario, Canada	112 MERTON ST, Toronto, Ontario, Canada
255	361 UNIVERSITY AVE	Toronto, Ontario, Canada	361 UNIVERSITY AVE, Toronto, Ontario, Canada
242	21 GLEBE RD E	Toronto, Ontario, Canada	21 GLEBE RD E, Toronto, Ontario, Canada
218	56 THE ESPLANADE	Toronto, Ontario, Canada	56 THE ESPLANADE, Toronto, Ontario, Canada
205	6 SPRING GARDEN AVE	Toronto, Ontario, Canada	6 SPRING GARDEN AVE, Toronto, Ontario,

Now FT has identified only one field as a location. Select the "Map_City_Province" Tab at the top right.

Edited at 11:17 PM		
File Edit Tools	Help Rows 1 -	E Cards 1 • Map of City_Province
Filter 👻 No filt	ers applied	
💌 🔹 1-20 of	20 🕩 🍽	
Hydrant_Count	Address	City_Province_Country AddressforFT
609	393 UNIVERSITY AVE	Toronto, Ontario, Canada UNIVERSITY AVE, Toronto, Ontario, Canada

FT will take a few seconds to geocode the information.



Now let's change the markers to allow our audience to distinguish the locations with the highest number of infractions. Select the "Change feature styles" tab to the left.

* Feature map		10			Schomberg [400]		Aurora 404
Change feature styles		11/1		Palgrave	Kleinburg	1	Gormley
Change info window	Luther Marsh + flife Management Area	Orangeville			Nobleton	King City	
▶ Heatmap			aledon.	Caledon East	Bolton	400 Rich	nmond Hill Mai
		24	10	Caledon	Kleinburg	Vaughan	404
		Frin			Woodbridg	e Concord	Newtopprook
		~ 2		\sim	. TH	Jane and Finch	North York
	- Fernus					Downsvie	

Points Marker icon	Map marker icons	
Polygons	Fixed Column Buckets	_
Fill color		
Border color	Use one icon	
Border width	• •	
Lines		
Line color		
Line width		
Legend		
Automatic legend		
		_
	Save Cancel	

Select the "Buckets" option. Then divide the "buckets" into three categories.

Points Marker icon Polygons	Map marker icons Fixed Column Buckets	
Fill color Border color	● Divide into 3 by ckets	
Border width		
Lines Line color	146 - 609 <u>use this range</u>	
Line width	+ 0.0 up to 33.333 • •	
Legend Automatic legend	+ - 33.333 up to 66.667 •	
, atomatio rogena	+ - 66.667 up to 100.0 -	
	100.0	

You'll notice that selecting the number of buckets provides the range of infractions in your table from lowest to highest. You can select as many categories as you want. But for mapping, it's perhaps easier to choose a low number, which makes it easier to spot the hot spot --393 University Avenue, the site of 609 infractions in 2013.

So we'll select three buckets, or range of values: 146 to 200; 200 to 336; and 336 to 610. Your selection should resemble the screen grab below.

Fixed Column Buckets
 Divide into Custom v buckets Column Hydrant_Count v 146 - 609 use this range + 146.0 up to 200.0 v + 200.0 up to 336.0 v + 336.0 up to 610.0 v 610.0 v

The colours FT has assigned are too small.

So let's change them. Click on the downward arrow to the right of the yellow circle.



Select large_yellow. Repeat the same process for the 200-336 category, giving it large_red; and the large_purple for the largest category or bucket.

Marker icon	Map marker icons
Polygons Fill color Border color Border width Lines Line color Line width Legend Automatic legend	Fixed Column Buckets
	+ 146.0 up to 200.0 + - 200.0 up to 336.0 + - 336.0 up to 610.0 € - 610.0

Before we save the result, let's give the map a legend. Select the "Automatic legend" option to the left. And check the box beside the "Show marker legend" option.

Marker icon	Automatic legends	
Polygons	Show marker legend	
Fill color	Title Hydrant_Count	
Border color Border width	Show polygon fill legend	
Lines	A bucket or gradient style is required	
Line color	Legend position	
Line width		
Legend		
Automatic legend		
	✓ Include a link to this table	
	Link text Source	

Save the result.



Locate the marker that represents the number one site.



The pop-up box is too busy. All we need to see is the hydrant count and the actual address (393 University Avenue). Select the "Change info window" tab to the left.



Automatic <u>Custor</u>	<u>m</u>	
Select the columns to in	clude in your map's info window.	
 ✔ Hydrant_Count ✔ Address ✔ City_Province_Country ✔ AddressforFT 	<div class="googft-info-window"> Hydrant_Count: {Hydrant_Count} Address: {Address} City_Province_Country: {City_Province_Country} AddressforFT: {AddressforFT} </div>	

De-select the bottom two columns and save the result. And then click on the same marker.



This ends the tutorial. For part two, we'll learn how to layer this map onto a second map containing the city's wards. To do so, we'll use two new tools: the mapping program called <u>Qgis</u>, and <u>Fusion Tables, Layer Wizard</u>.