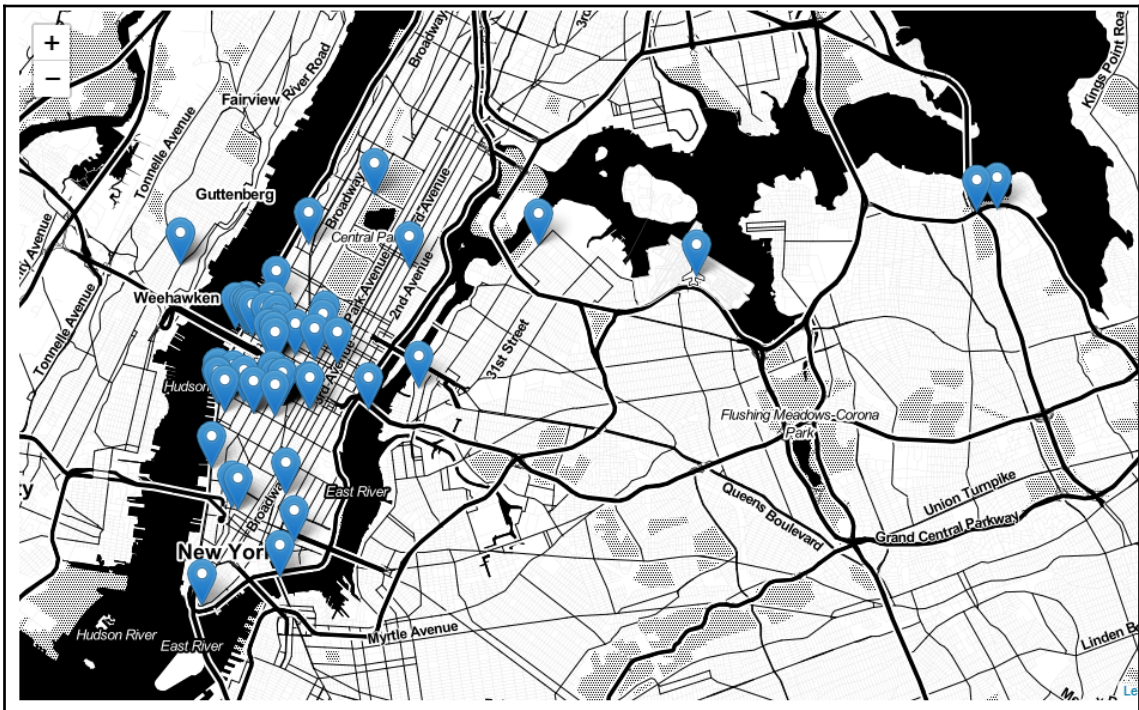
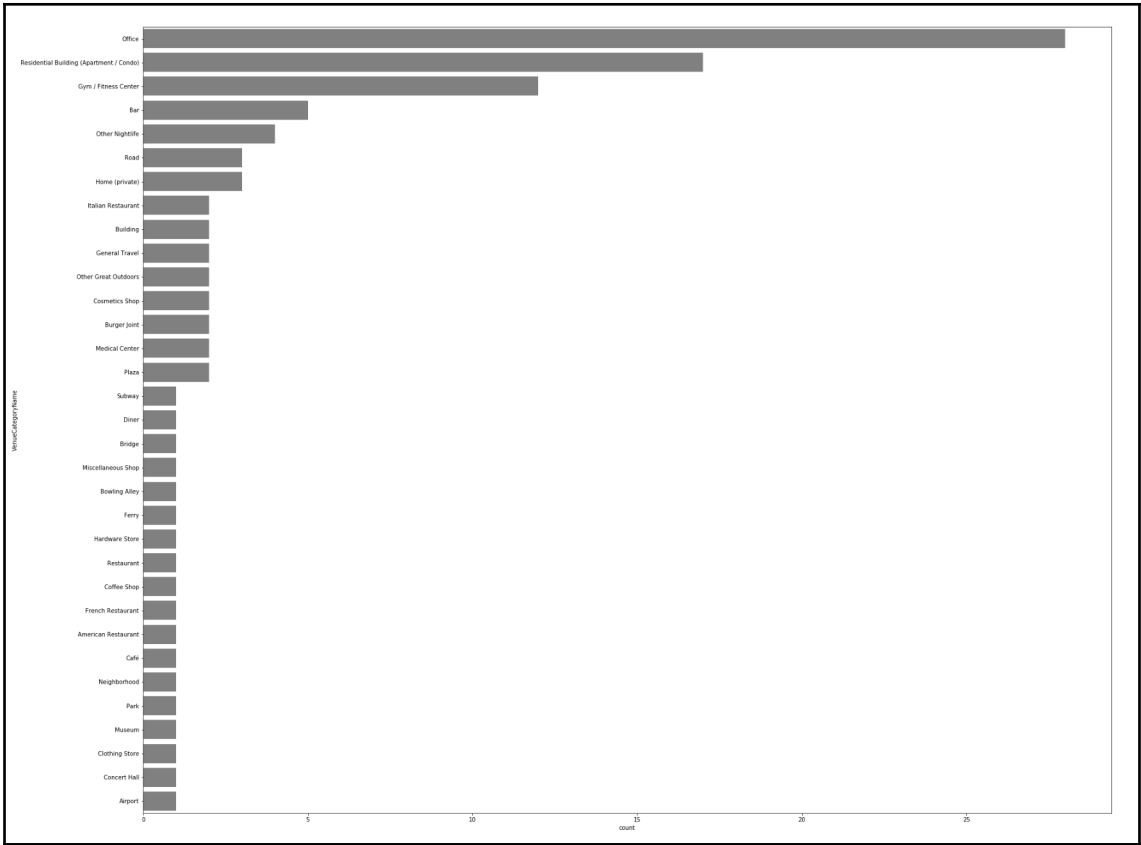
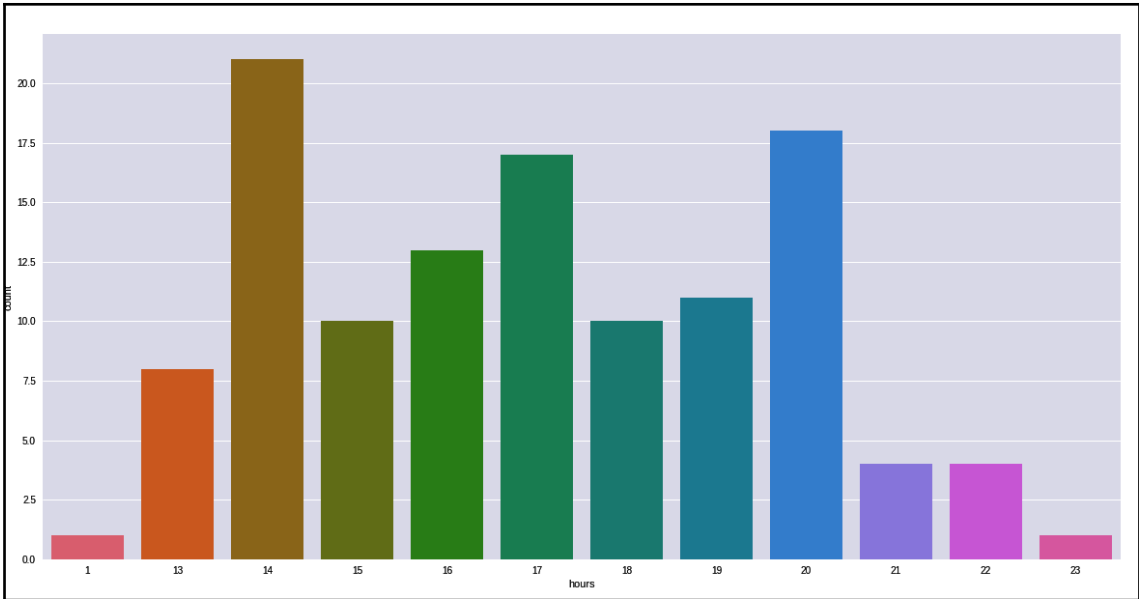


Chapter 1: Introducing Location Intelligence

UserID	VenueID	VenueCategoryID	VenueCategoryName	Latitude	Longitude	Timezone	UTCtime	
0	470	49bbd6c0f964a520f4531fe3	4bf58dd8d48988d127951735	Arts & Crafts Store	40.719810	-74.002581	-240	Tue Apr 03 18:00:09 +0000 2012
1	979	4a43c0aef964a520c6a61fe3	4bf58dd8d48988d1df941735	Bridge	40.606800	-74.044170	-240	Tue Apr 03 18:00:25 +0000 2012
2	69	4c5cc7b485a1e21e00d35711	4bf58dd8d48988d103941735	Home (private)	40.716162	-73.883070	-240	Tue Apr 03 18:02:24 +0000 2012
3	395	4bc7086715a7ef3bef9878da	4bf58dd8d48988d104941735	Medical Center	40.745164	-73.982519	-240	Tue Apr 03 18:02:41 +0000 2012
4	87	4cf2c5321d18a143951b5cec	4bf58dd8d48988d1cb941735	Food Truck	40.740104	-73.989658	-240	Tue Apr 03 18:03:00 +0000 2012







CO Overview of Colaboratory Features
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- Integration with Drive
- Commenting on a cell
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Cells

A notebook is a list of cells. Cells contain either explanatory text or executable code and its output. Click a cell to select it.

Code cells

Below is a **code cell**. Once the toolbar button indicates CONNECTED, click in the cell to select it and execute the contents in the following ways:

- Click the **Play icon** in the left gutter of the cell;
- Type **Cmd/Ctrl+Enter** to run the cell in place;
- Type **Shift+Enter** to run the cell and move focus to the next cell (adding one if none exists); or
- Type **Alt+Enter** to run the cell and insert a new code cell immediately below it.

There are additional options for running some or all cells in the **Runtime** menu.

```
[ ] 1 a = 10
    2 a
```

10

Text cells

This is a **text cell**. You can **double-click** to edit this cell. Text cells use markdown syntax. To learn more, see our [markdown guide](#).

You can also add math to text cells using [LaTeX](#) to be rendered by [MathJax](#). Just place the statement within a pair of **\$** signs. For example $\$(3x-1)+(1+x)^2\$$ becomes $\sqrt{3x-1} + (1+x)^2$.

Adding and moving cells

You can add new cells by using the **+ CODE** and **+ TEXT** buttons that show when you hover between cells. These buttons are also in the toolbar above the notebook where they can be used to add a cell below the currently selected cell.

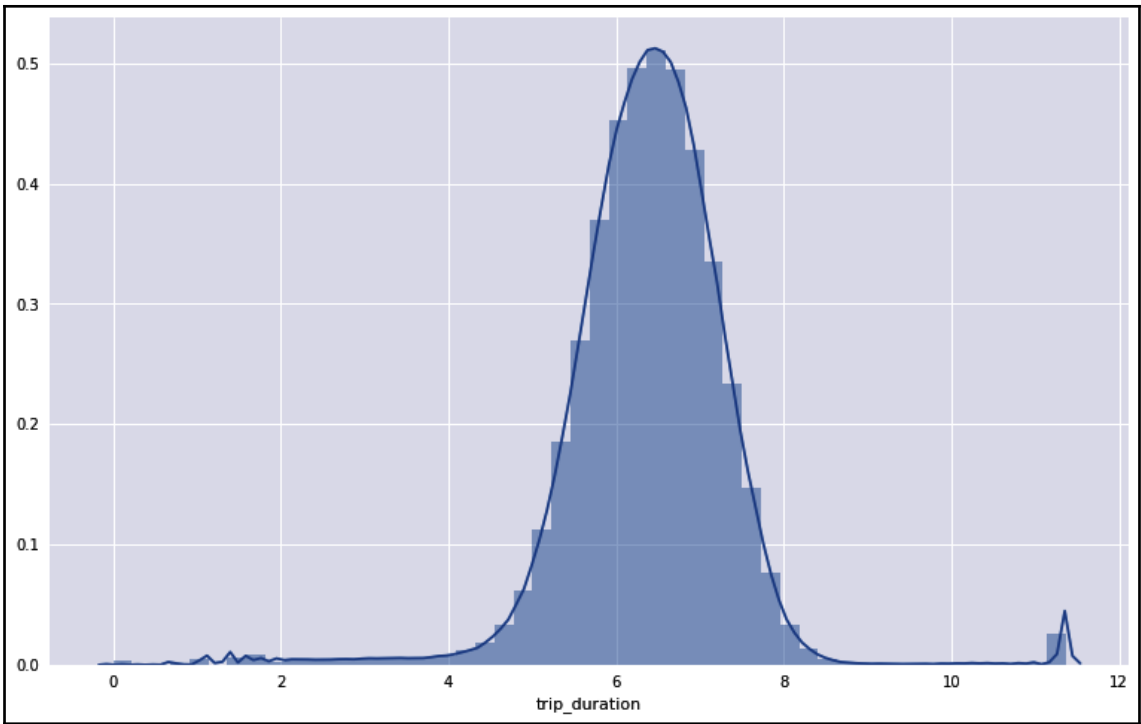
You can move a cell by selecting it and clicking **Cell Up** or **Cell Down** in the top toolbar.

Consecutive cells can be selected by "lasso selection" by dragging from outside one cell and through the group. Non-adjacent cells can be selected concurrently by clicking one and then holding down **Ctrl** while clicking another. Similarly, using **Shift** instead of **Ctrl** will select all intermediate cells.

Chapter 2: Consuming Location Data Like a Data Scientist

	0	1	2	3	4
VendorID	2	2	2	2	1
lpep_pickup_datetime	05/07/2016 02:25:05 AM	05/07/2016 02:21:26 AM	05/08/2016 12:54:22 AM	05/08/2016 12:51:46 AM	05/07/2016 04:19:06 PM
Lpep_dropoff_datetime	05/07/2016 02:38:19 AM	05/07/2016 02:43:46 AM	05/08/2016 01:10:20 AM	05/08/2016 01:04:24 AM	05/07/2016 04:24:20 PM
Store_and_fwd_flag	N	N	N	N	N
RateCodeID	1	1	1	1	1
Pickup_longitude	-73.9589	-73.9234	-73.956	-73.9156	-73.9391
Pickup_latitude	40.7168	40.7069	40.8047	40.7433	40.8054
Dropoff_longitude	-73.9324	-74.0163	-73.9173	-73.9135	-73.9538
Dropoff_latitude	40.7079	40.7112	40.8244	40.7657	40.8063
Passenger_count	6	1	1	1	1
Trip_distance	2.25	6.34	3.3	2.21	1
Fare_amount	11	22	13.5	10.5	5.5
Extra	0.5	0.5	0.5	0.5	0
MTA_tax	0.5	0.5	0.5	0.5	0.5
Tip_amount	0	1	0	0	1.25
Tolls_amount	0	0	0	0	0
Ehail_fee	NaN	NaN	NaN	NaN	NaN
improvement_surcharge	0.3	0.3	0.3	0.3	0.3
Total_amount	12.3	24.3	14.8	11.8	7.55
Payment_type	1	1	2	1	1
Trip_type	1	1	1	1	1
PULocationID	NaN	NaN	NaN	NaN	NaN
DOLocationID	NaN	NaN	NaN	NaN	NaN

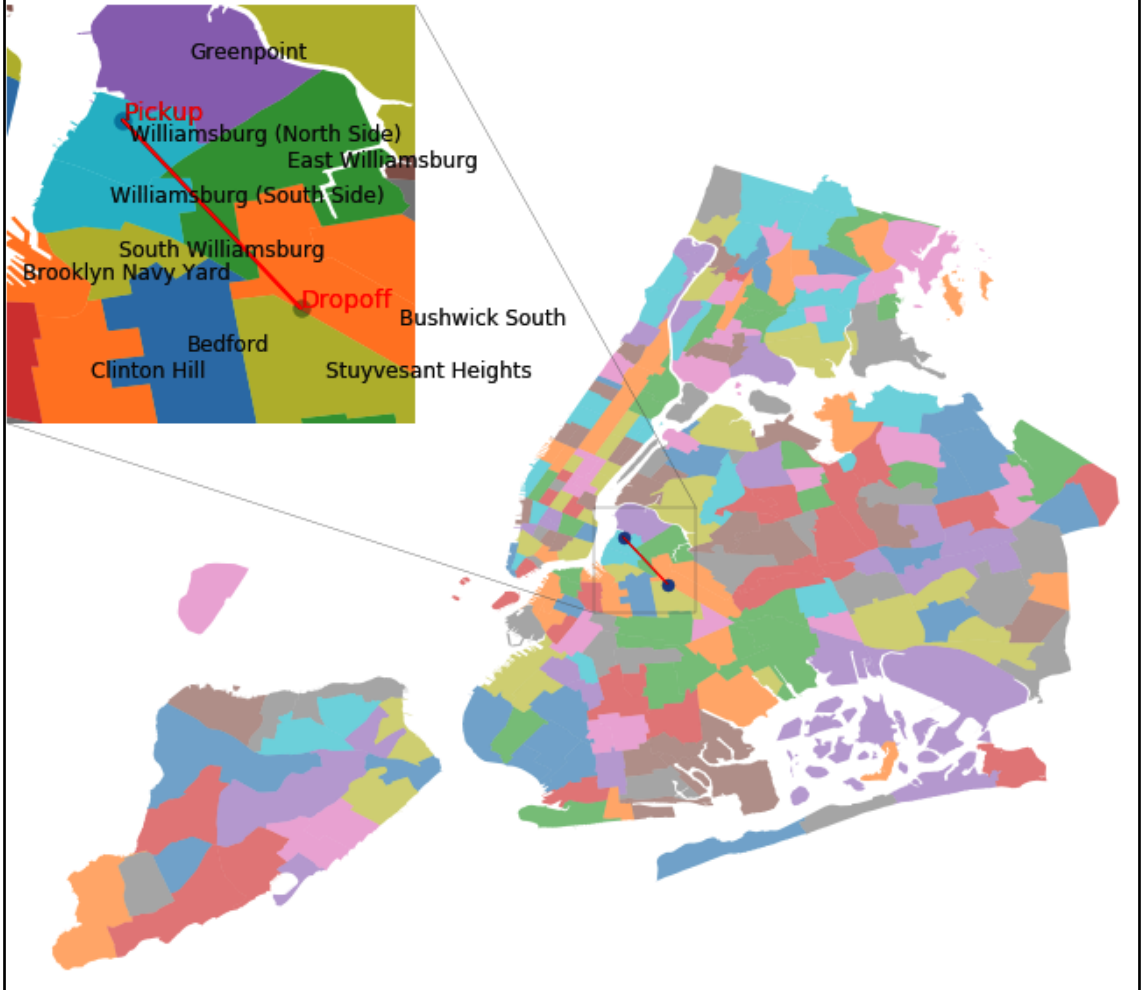
	null_row_pct
Ehail_fee	1.000000
PULocationID	0.550597
DOLocationID	0.550597
Pickup_longitude	0.449403
Pickup_latitude	0.449403
Dropoff_longitude	0.449403
Dropoff_latitude	0.449403
Trip_type	0.000030

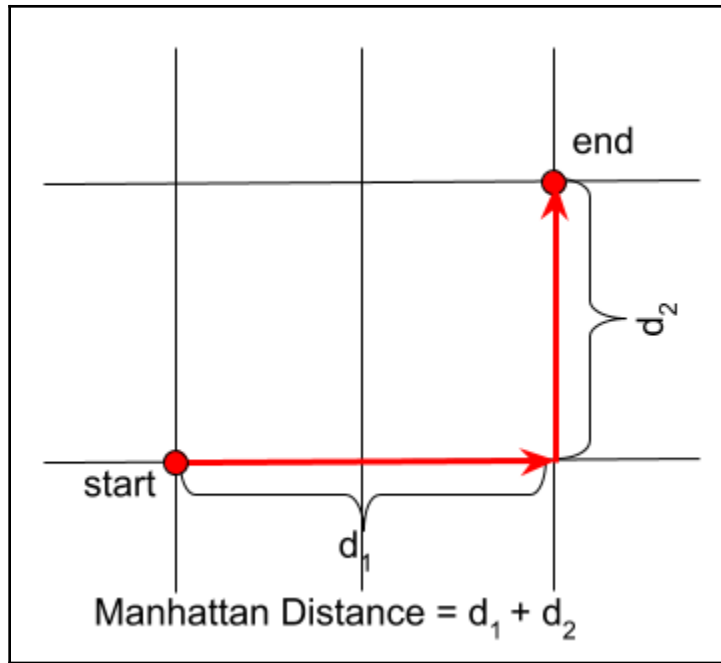


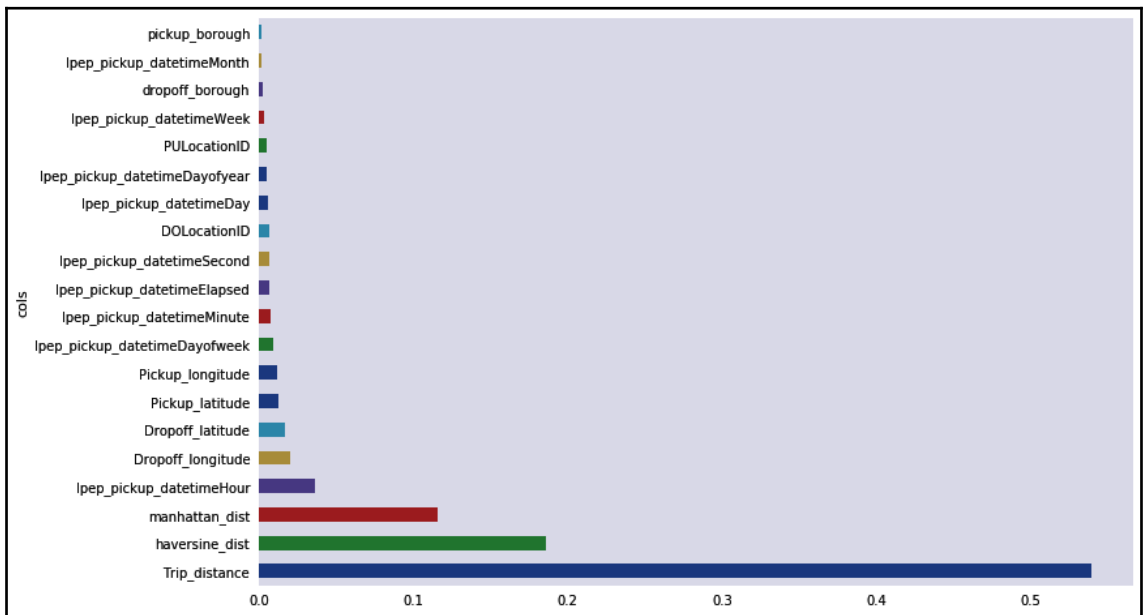
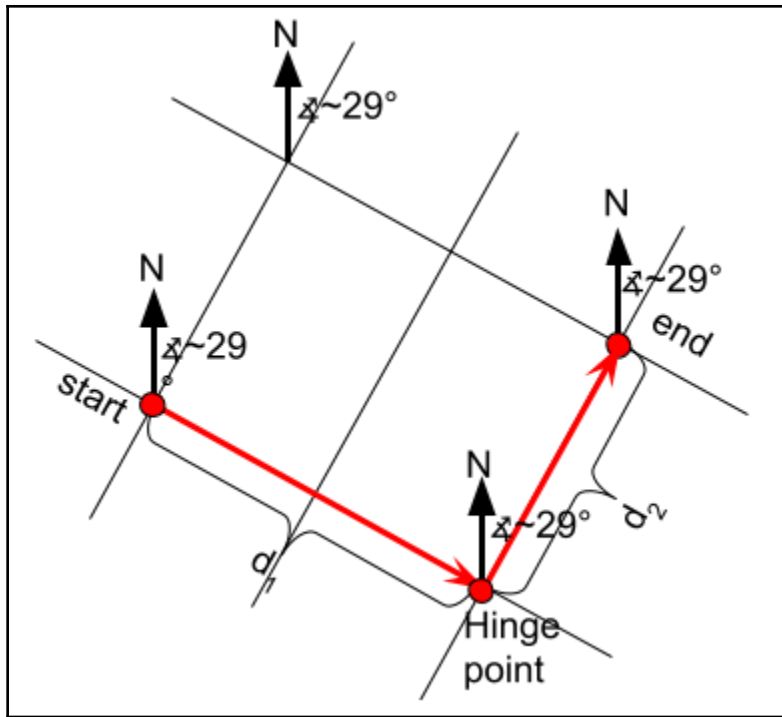
Payment_type	2	1	2	1	1
Trip_type	1	1	1	1	1
PULocationID	NaN	NaN	NaN	NaN	NaN
DOLocationID	NaN	NaN	NaN	NaN	NaN
lpep_pickup_datetimeYear	2016	2016	2016	2016	2016
lpep_pickup_datetimeMonth	5	5	5	5	5
lpep_pickup_datetimeWeek	18	18	18	18	18
lpep_pickup_datetimeDay	7	7	7	7	7
lpep_pickup_datetimeDayofweek	5	5	5	5	5
lpep_pickup_datetimeDayofyear	128	128	128	128	128
lpep_pickup_datetimels_month_end	False	False	False	False	False
lpep_pickup_datetimels_month_start	False	False	False	False	False
lpep_pickup_datetimels_quarter_end	False	False	False	False	False
lpep_pickup_datetimels_quarter_start	False	False	False	False	False
lpep_pickup_datetimels_year_end	False	False	False	False	False
lpep_pickup_datetimels_year_start	False	False	False	False	False
lpep_pickup_datetimeHour	16	16	16	2	2
lpep_pickup_datetimeMinute	24	20	20	2	24
lpep_pickup_datetimeSecond	5	59	50	17	26
lpep_pickup_datetimeElapsed	1462638245	1462638059	1462638050	1462586537	1462587866

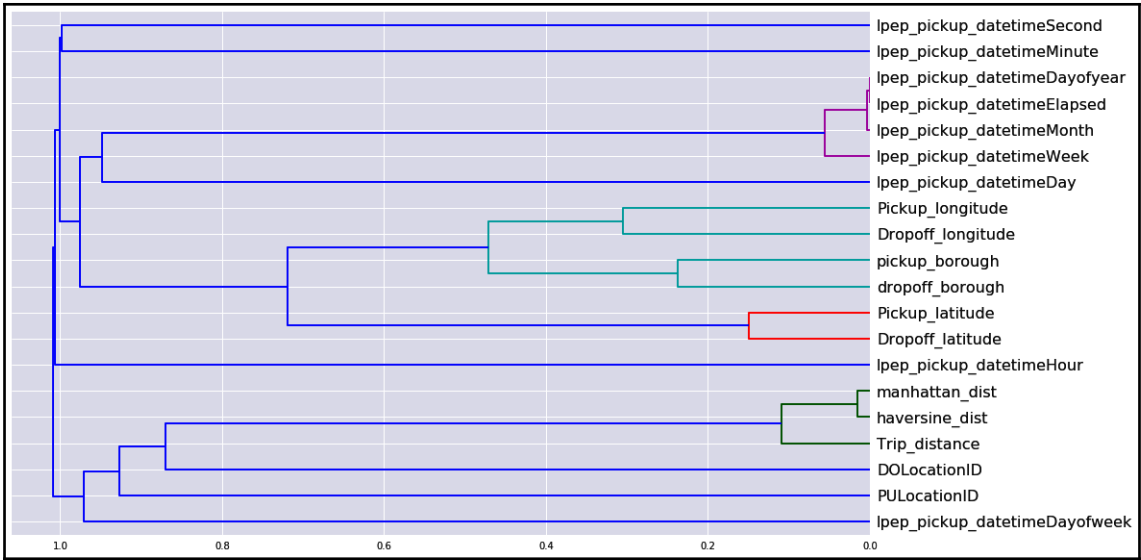
	258	259	260	261
OBJECTID	259	260	261	262
Shape_Leng	0.12675	0.133514	0.0271205	0.0490636
Shape_Area	0.000394552	0.000422345	3.43423e-05	0.00012233
zone	Woodlawn/Wakefield	Woodside	World Trade Center	Yorkville East
LocationID	259	260	261	262
borough	Bronx	Queens	Manhattan	Manhattan
geometry	POLYGON ((1025414.781960189 270986.1393638253,...	POLYGON ((1011466.966050446 216463.0052037984,...	POLYGON ((980555.2043112218 196138.486258477, ...	POLYGON ((999804.7945504487 224498.5270484537,...

NY Taxi zones









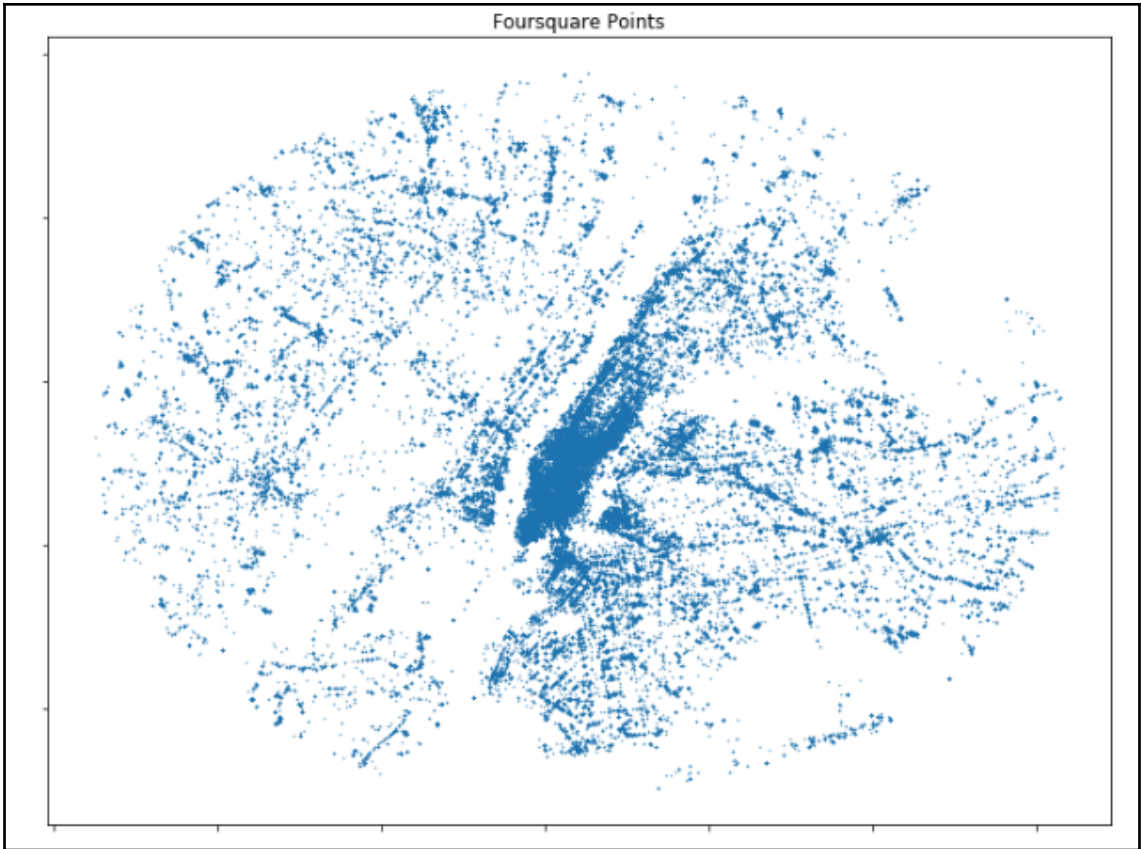
Chapter 3: Performing Spatial Operations Like a Pro

UserID	VenueID	VenueCategoryID	VenueCategoryName	Latitude	Longitude	Timezone	UTCtime
0	470	49bbd6c0f964a520f4531fe3	4bf58dd8d48988d127951735	Arts & Crafts Store	40.719810	-74.002581	-240 Tue Apr 03 18:00:09 +0000 2012
1	979	4a43c0aef964a520c6a61fe3	4bf58dd8d48988d1df941735	Bridge	40.606800	-74.044170	-240 Tue Apr 03 18:00:25 +0000 2012
2	69	4c5cc7b485a1e21e00d35711	4bf58dd8d48988d103941735	Home (private)	40.716162	-73.883070	-240 Tue Apr 03 18:02:24 +0000 2012
3	395	4bc7086715a7ef3bef9878da	4bf58dd8d48988d104941735	Medical Center	40.745164	-73.982519	-240 Tue Apr 03 18:02:41 +0000 2012
4	87	4cf2c5321d18a143951b5cec	4bf58dd8d48988d1cb941735	Food Truck	40.740104	-73.989658	-240 Tue Apr 03 18:03:00 +0000 2012

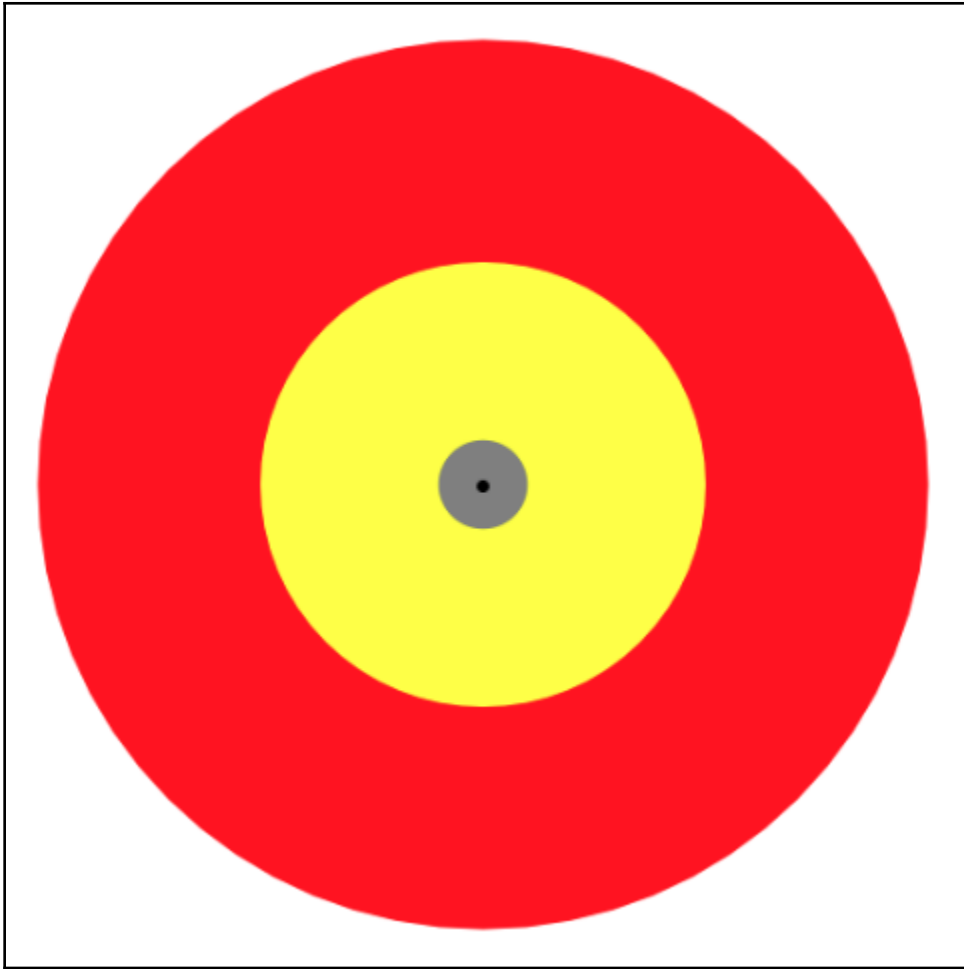
```
(40.71981037548853, -74.00258103213994)
(40.606799581406435, -74.04416981025437)
(40.71616168484322, -73.88307005845945)
(40.7451638, -73.982518775)
(40.74010382743943, -73.98965835571289)
```

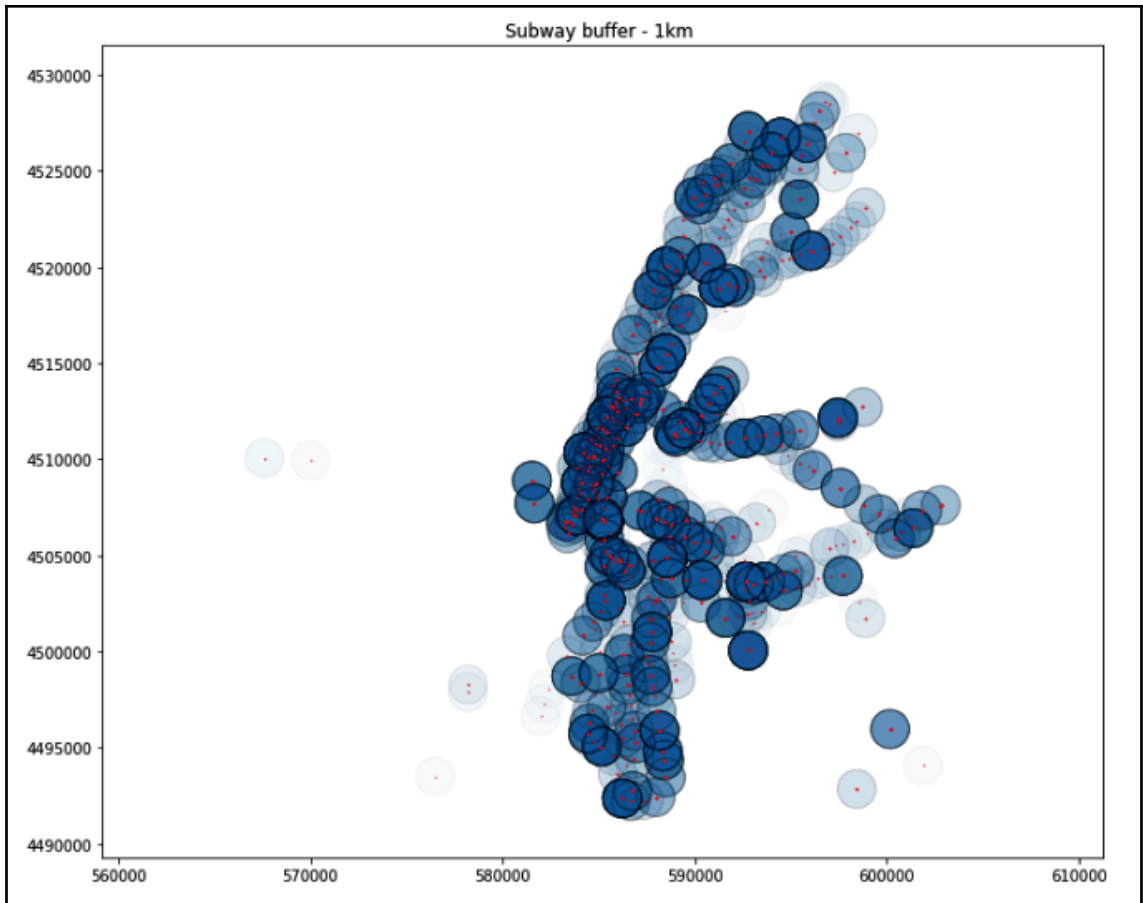
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POINT (40.71981037548853 -74.00258103213994)
POINT (40.60679958140643 -74.04416981025437)
POINT (40.71616168484322 -73.88307005845945)
POINT (40.7451638 -73.982518775)
POINT (40.74010382743943 -73.98965835571289)
```

UserID	VenueID	VenueCategoryID	VenueCategoryName	Latitude	Longitude	Timezone	UTCtime	geometry
0	470	49bbd6c0f964a520f4531fe3	4bf58dd8d48988d127951735	Arts & Crafts Store	40.719810	-74.002581	-240 Tue Apr 03 18:00:09 +0000 2012	POINT (40.71981037548853 -74.00258103213994)
1	979	4a43c0aef964a520c6a61fe3	4bf58dd8d48988d1df941735	Bridge	40.606800	-74.044170	-240 Tue Apr 03 18:00:25 +0000 2012	POINT (40.60679958140643 -74.04416981025437)
2	69	4c5cc7b485a1e21e00d35711	4bf58dd8d48988d103941735	Home (private)	40.716162	-73.883070	-240 Tue Apr 03 18:02:24 +0000 2012	POINT (40.71616168484322 -73.88307005845945)
3	395	4bc7086715a7ef3bef9878da	4bf58dd8d48988d104941735	Medical Center	40.745164	-73.982519	-240 Tue Apr 03 18:02:41 +0000 2012	POINT (40.7451638 -73.982518775)
4	87	4cf2c5321d18a143951b5cec	4bf58dd8d48988d1cb941735	Food Truck	40.740104	-73.989658	-240 Tue Apr 03 18:03:00 +0000 2012	POINT (40.74010382743943 -73.98965835571289)

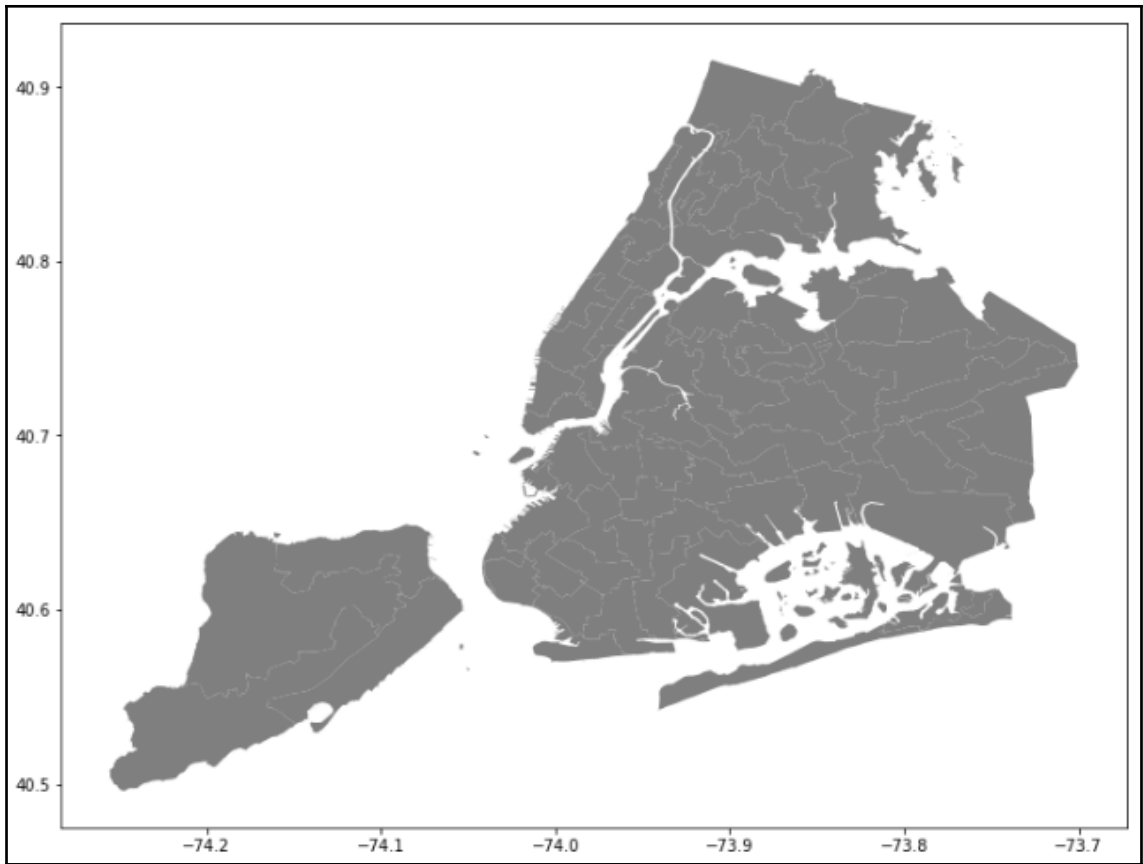


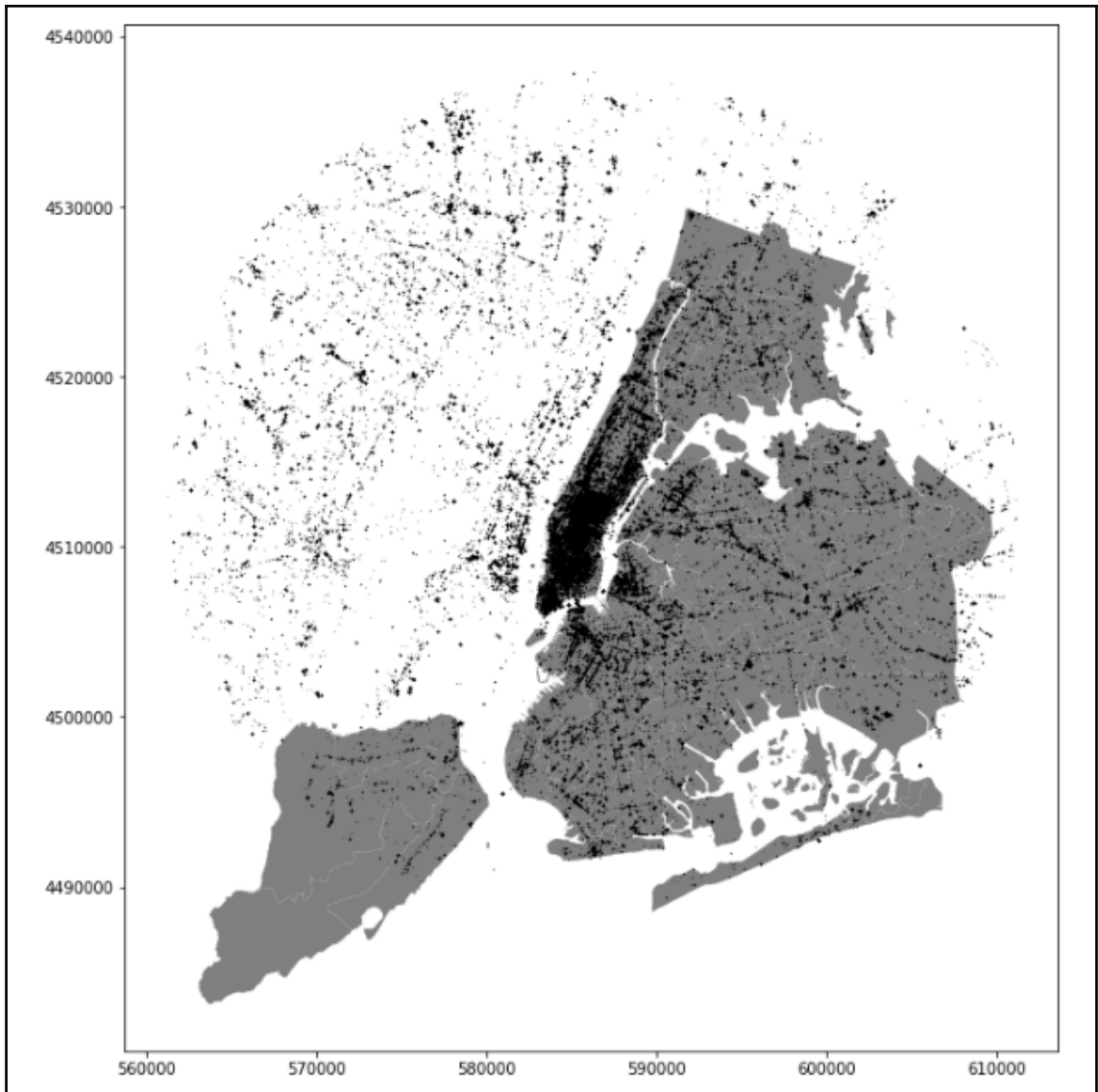
UserID	VenueID	VenueCategoryID	VenueCategoryName	Latitude	Longitude	Timezone	UTCtime	geometry	
0	470	49bbd6c0f964a520f4531fe3	4bf58dd8d48988d127951735	Arts & Crafts Store	40.719810	-74.002581	-240	Tue Apr 03 18:00:09 +0000 2012	POINT (584239.3260128839 4508132.469739441)
1	979	4a43c0aef964a520c6a61fe3	4bf58dd8d48988d1df941735	Bridge	40.606800	-74.044170	-240	Tue Apr 03 18:00:25 +0000 2012	POINT (580863.1796990195 4495548.605023375)
2	69	4c5cc7b485a1e21e00d35711	4bf58dd8d48988d103941735	Home (private)	40.716162	-73.883070	-240	Tue Apr 03 18:02:24 +0000 2012	POINT (594338.2357704557 4507848.94936957)
3	395	4bc7086715a7ef3bef9878da	4bf58dd8d48988d104941735	Medical Center	40.745164	-73.982519	-240	Tue Apr 03 18:02:41 +0000 2012	POINT (585901.1405895475 4510966.314499039)
4	87	4cf2c5321d18a143951b5cec	4bf58dd8d48988d1cb941735	Food Truck	40.740104	-73.989658	-240	Tue Apr 03 18:03:00 +0000 2012	POINT (585304.8352019053 4510397.658739946)

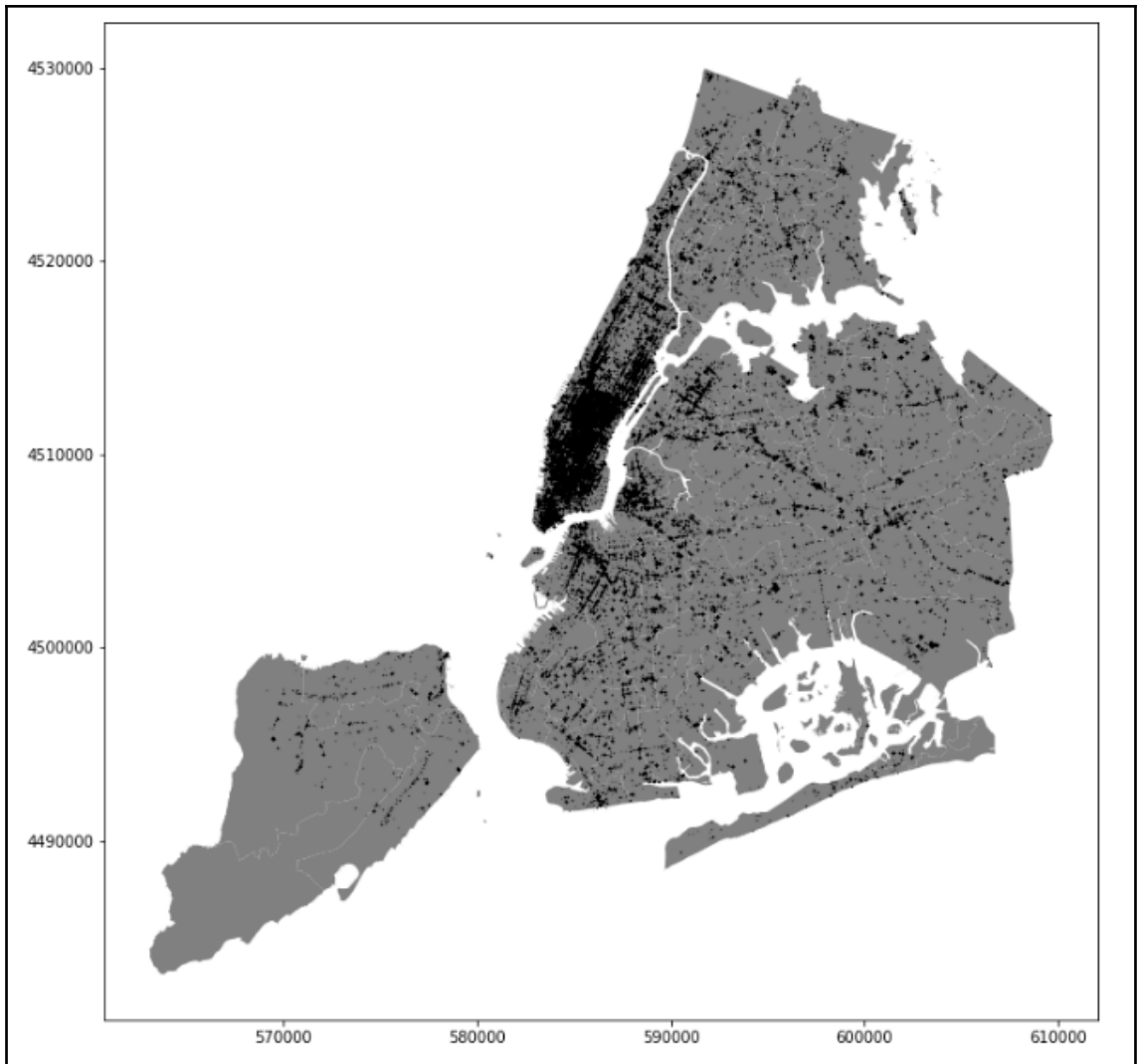


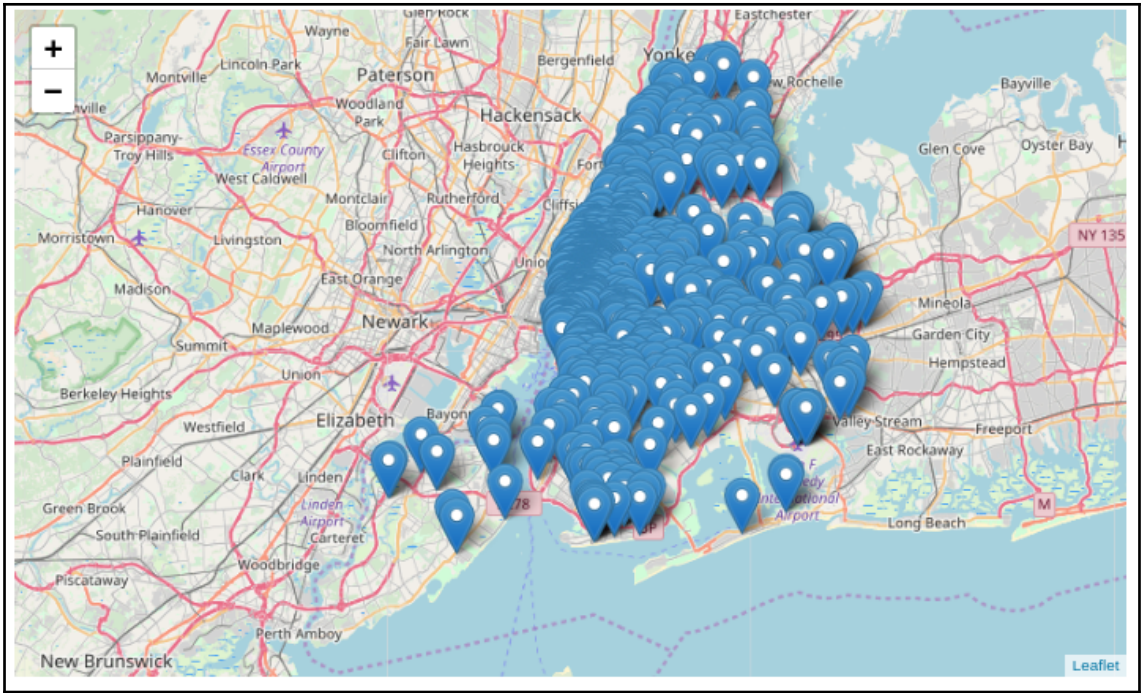


OBJECTID	AssemDist	Shape_Area	Shape_Length	geometry
0	1	34	5.549695e+07	60366.244237 POLYGON ((-73.89191238093809 40.7657193793578,...
1	2	47	6.717310e+07	47467.275604 POLYGON ((-73.97299577171449 40.6088223789542,...
2	3	48	7.374100e+07	51820.347851 POLYGON ((-73.9609192013542 40.627682756256, -...
3	4	49	6.114401e+07	54424.138562 POLYGON ((-73.9998906540922 40.6379042694496, ...
4	5	54	7.937047e+07	73969.610179 POLYGON ((-73.9087750768648 40.6982634836477, ...







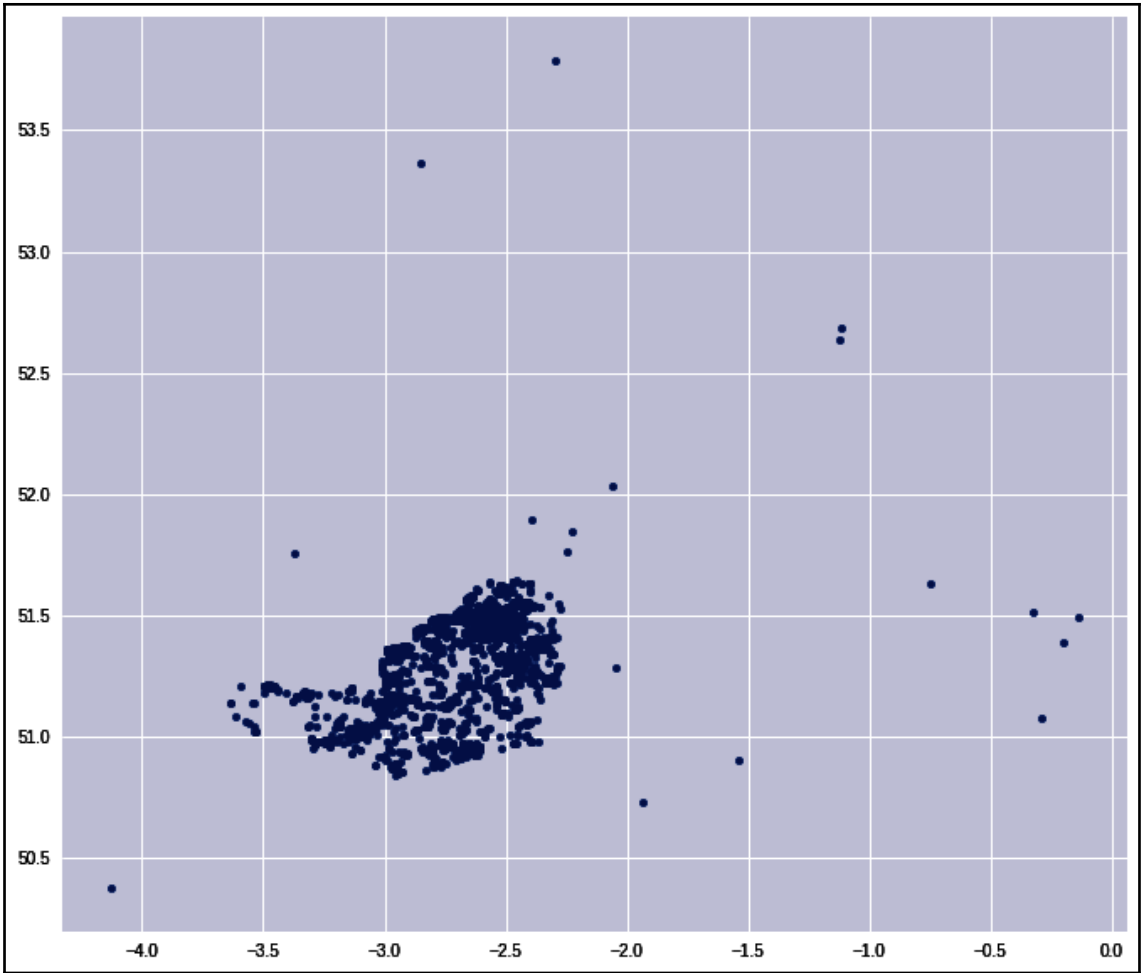


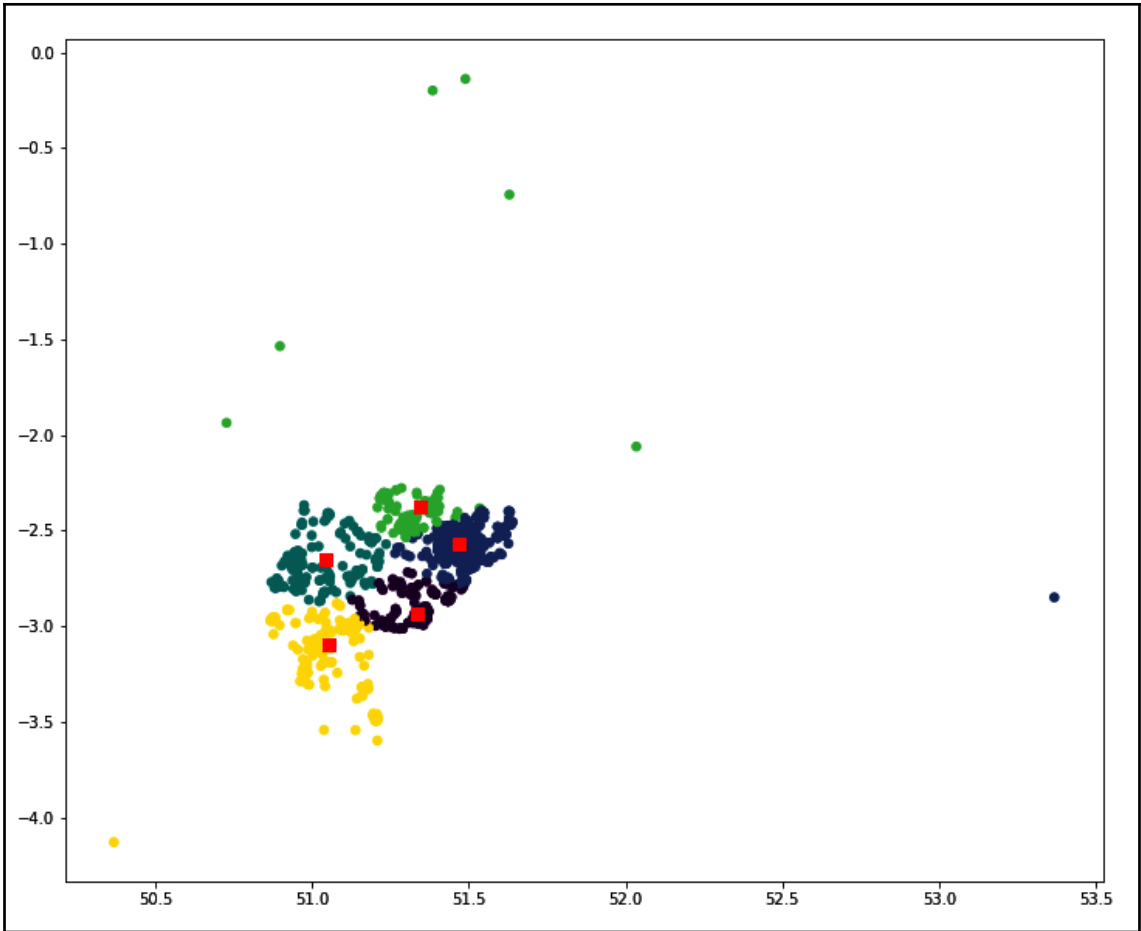


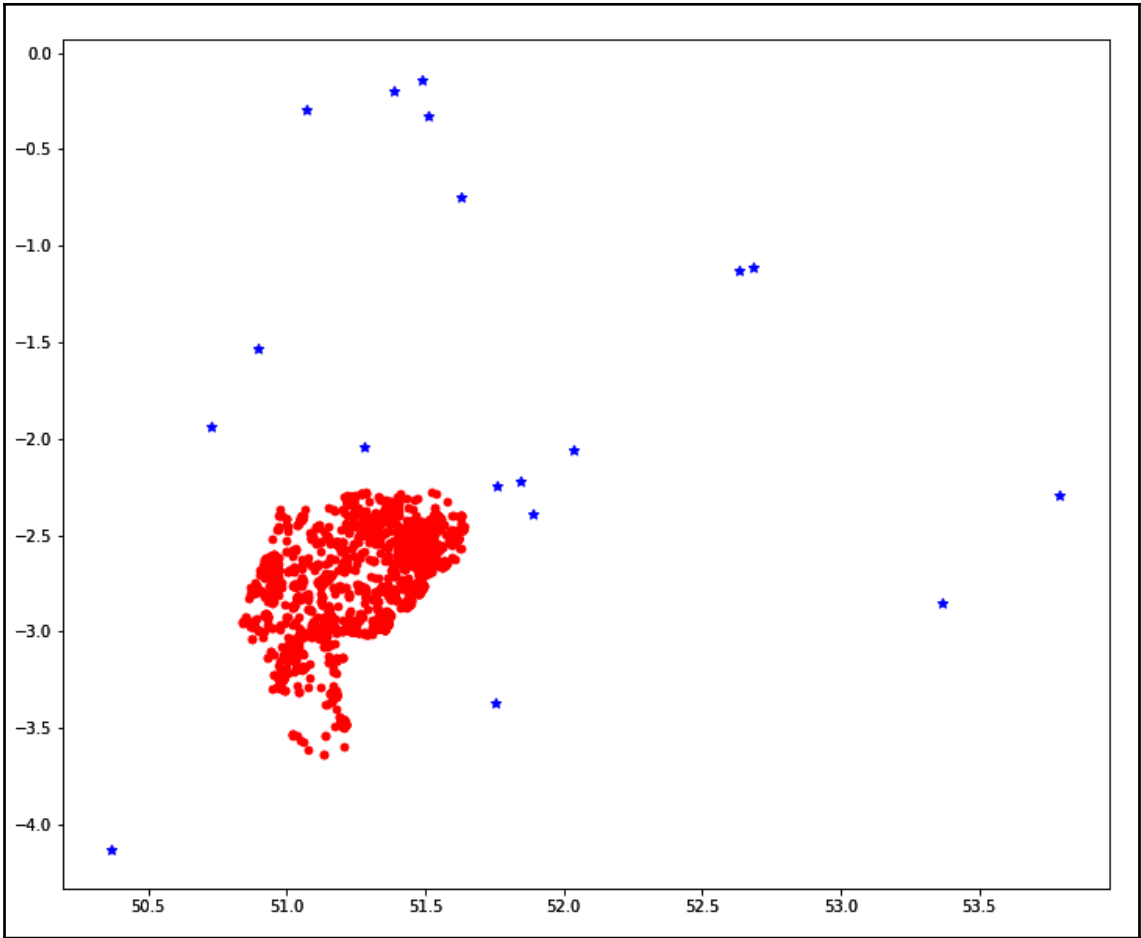
Chapter 4: Making Sense of Humongous Location Datasets

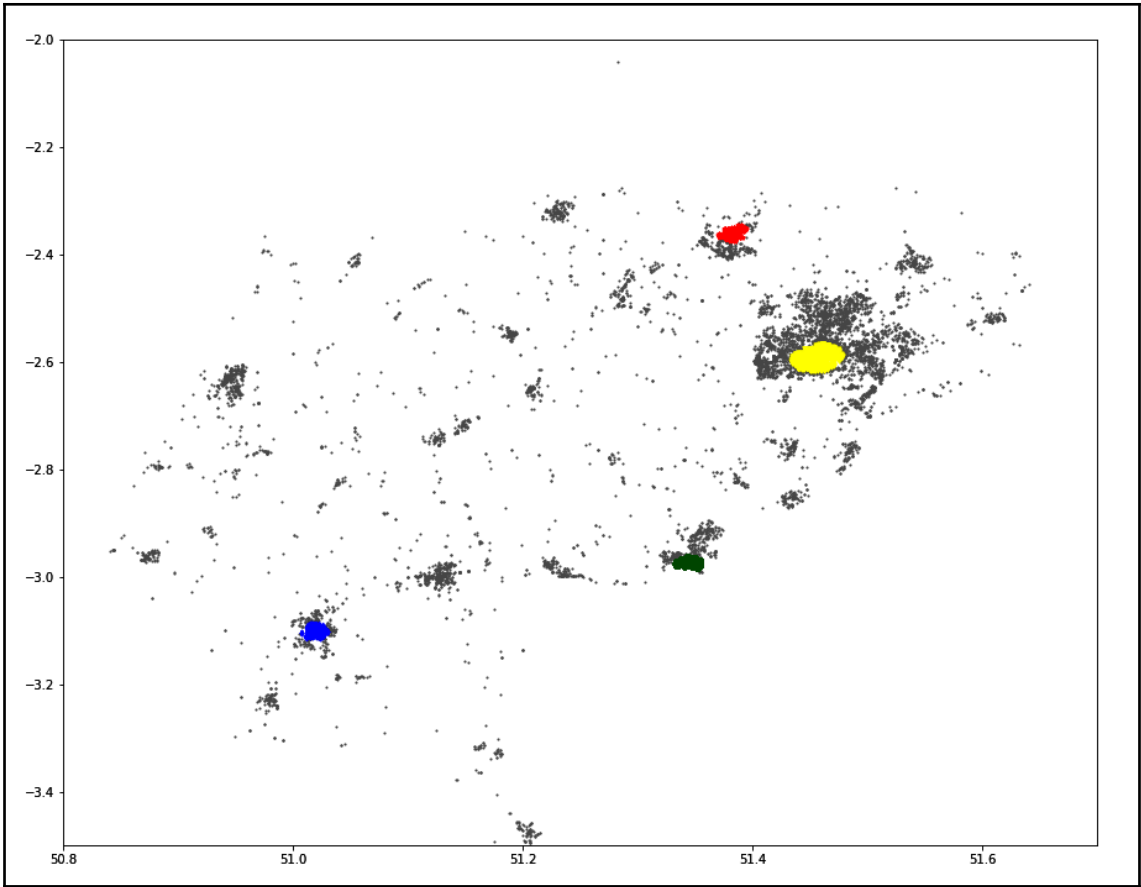
Crime ID	Month	Reported by	Falls within	Longitude	Latitude	Location	LSOA code	LSOA name	Crime type	Last outcome category	Context	
0	NaN	2019-02	Avon and Somerset Constabulary	Avon and Somerset Constabulary	-2.515072	51.419357	On or near Stockwood Hill	E01014399	Bath and North East Somerset 001A	Anti-social behaviour	NaN	NaN
1	NaN	2019-02	Avon and Somerset Constabulary	Avon and Somerset Constabulary	-2.516919	51.423683	On or near A4175	E01014399	Bath and North East Somerset 001A	Anti-social behaviour	NaN	NaN
2	NaN	2019-02	Avon and Somerset Constabulary	Avon and Somerset Constabulary	-2.516919	51.423683	On or near A4175	E01014399	Bath and North East Somerset 001A	Anti-social behaviour	NaN	NaN
3	NaN	2019-02	Avon and Somerset Constabulary	Avon and Somerset Constabulary	-2.509384	51.409590	On or near Barnard Walk	E01014399	Bath and North East Somerset 001A	Anti-social behaviour	NaN	NaN
4	NaN	2019-02	Avon and Somerset Constabulary	Avon and Somerset Constabulary	-2.509126	51.416137	On or near St Francis Road	E01014399	Bath and North East Somerset 001A	Anti-social behaviour	NaN	NaN

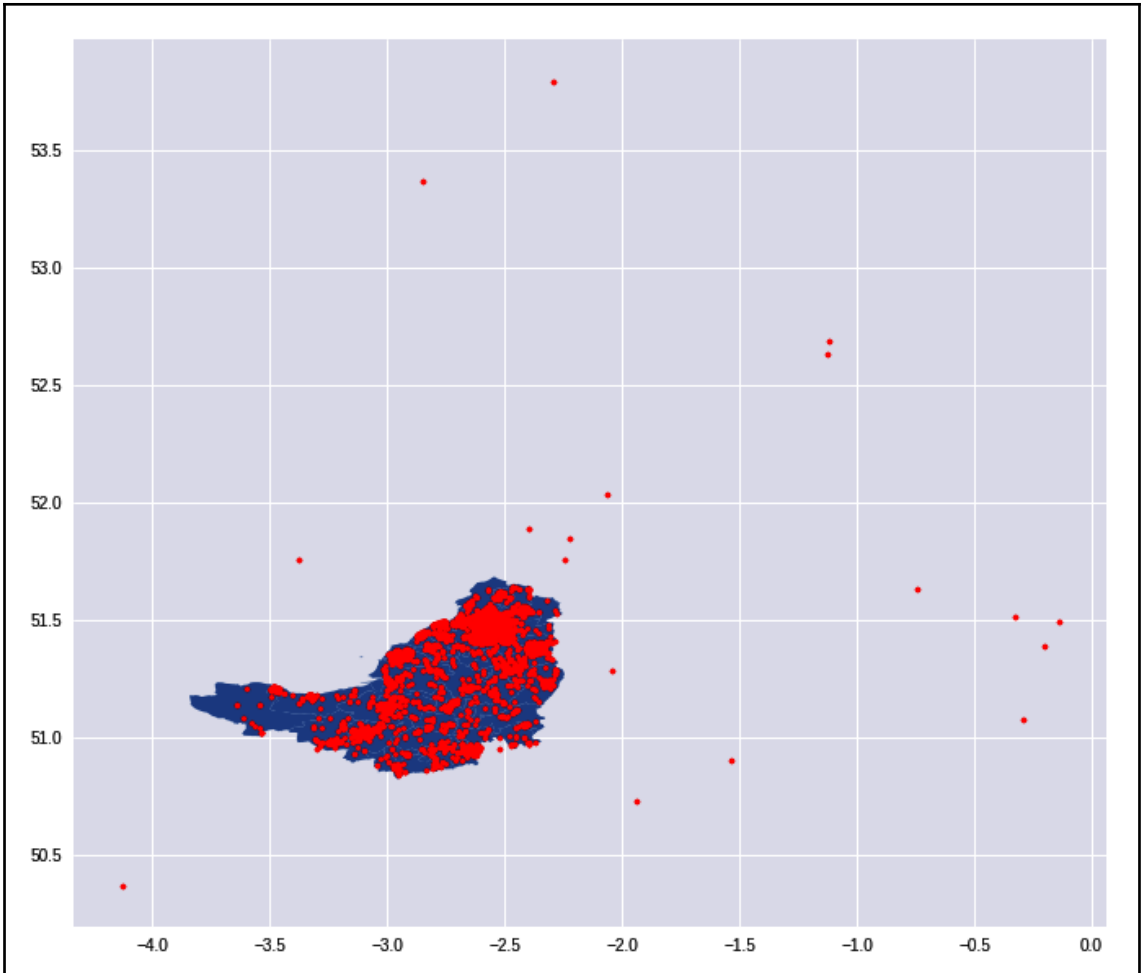
Crime dataset





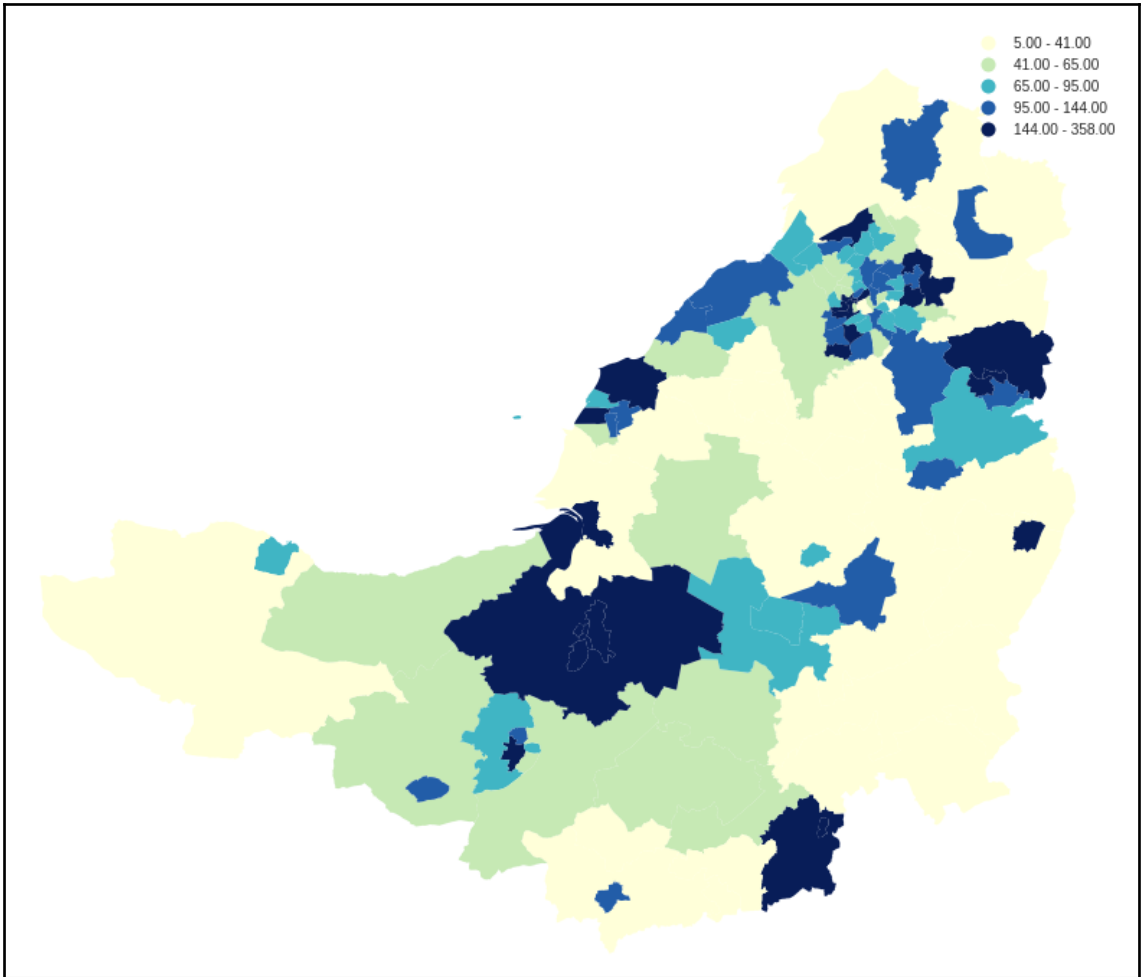


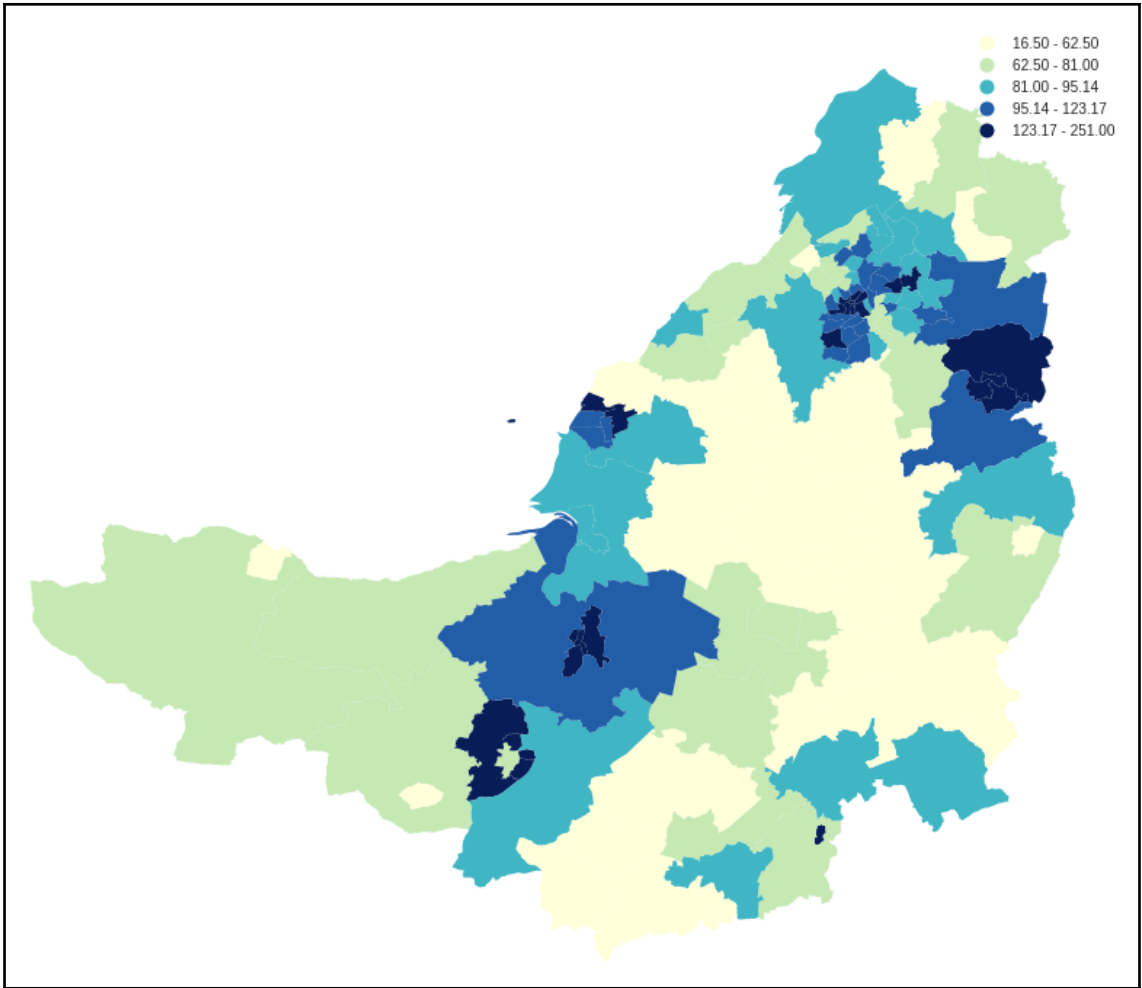


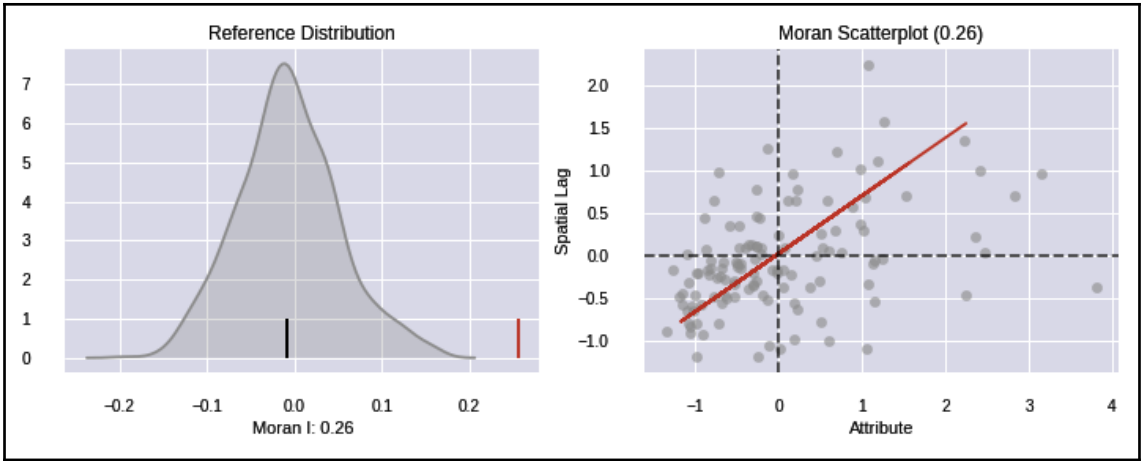


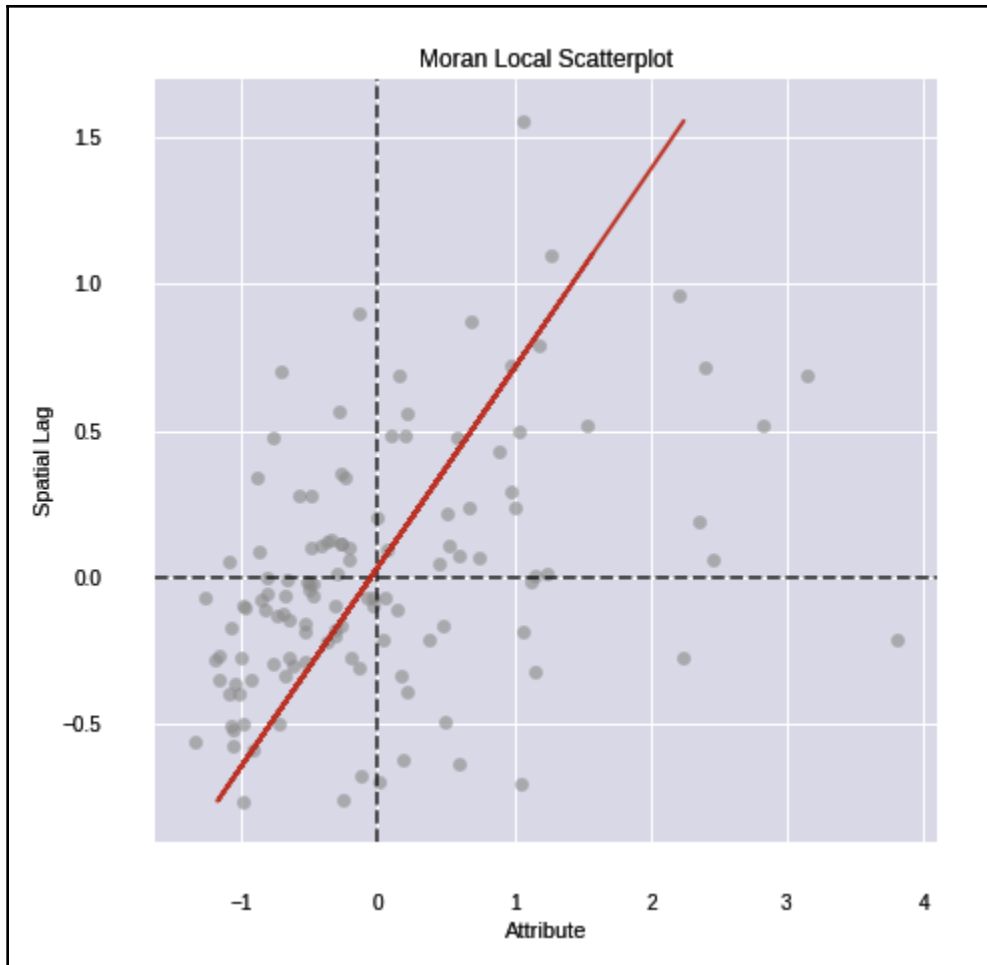
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0	AE037	Yeovil Centre (One Team)	Yeovil	AE - Somerset East	A - Somerset	POLYGON Z ((-2.627019923440824 50.955264354592...	10230	2019-02	Avon and Somerset Constabulary	Avon and Somerset Constabulary	-2.62479	50.954338	On or near Allingham Road	E01029235	South Somerset 014C	Anti-social behaviour
0	AE037	Yeovil Centre (One Team)	Yeovil	AE - Somerset East	A - Somerset	POLYGON Z ((-2.627019923440824 50.955264354592...	10241	2019-02	Avon and Somerset Constabulary	Avon and Somerset Constabulary	-2.62479	50.954338	On or near Allingham Road	E01029235	South Somerset 014C	Violence and sexual offences
0	AE037	Yeovil Centre (One Team)	Yeovil	AE - Somerset East	A - Somerset	POLYGON Z ((-2.627019923440824 50.955264354592...	10240	2019-02	Avon and Somerset Constabulary	Avon and Somerset Constabulary	-2.62479	50.954338	On or near Allingham Road	E01029235	South Somerset 014C	Violence and sexual offences
0	AE037	Yeovil Centre (One Team)	Yeovil	AE - Somerset East	A - Somerset	POLYGON Z ((-2.627019923440824 50.955264354592...	10239	2019-02	Avon and Somerset Constabulary	Avon and Somerset Constabulary	-2.62479	50.954338	On or near Allingham Road	E01029235	South Somerset 014C	Violence and sexual offences
0	AE037	Yeovil Centre (One Team)	Yeovil	AE - Somerset East	A - Somerset	POLYGON Z ((-2.627019923440824 50.955264354592...	10232	2019-02	Avon and Somerset Constabulary	Avon and Somerset Constabulary	-2.62479	50.954338	On or near Allingham Road	E01029235	South Somerset 014C	Criminal damage and arson

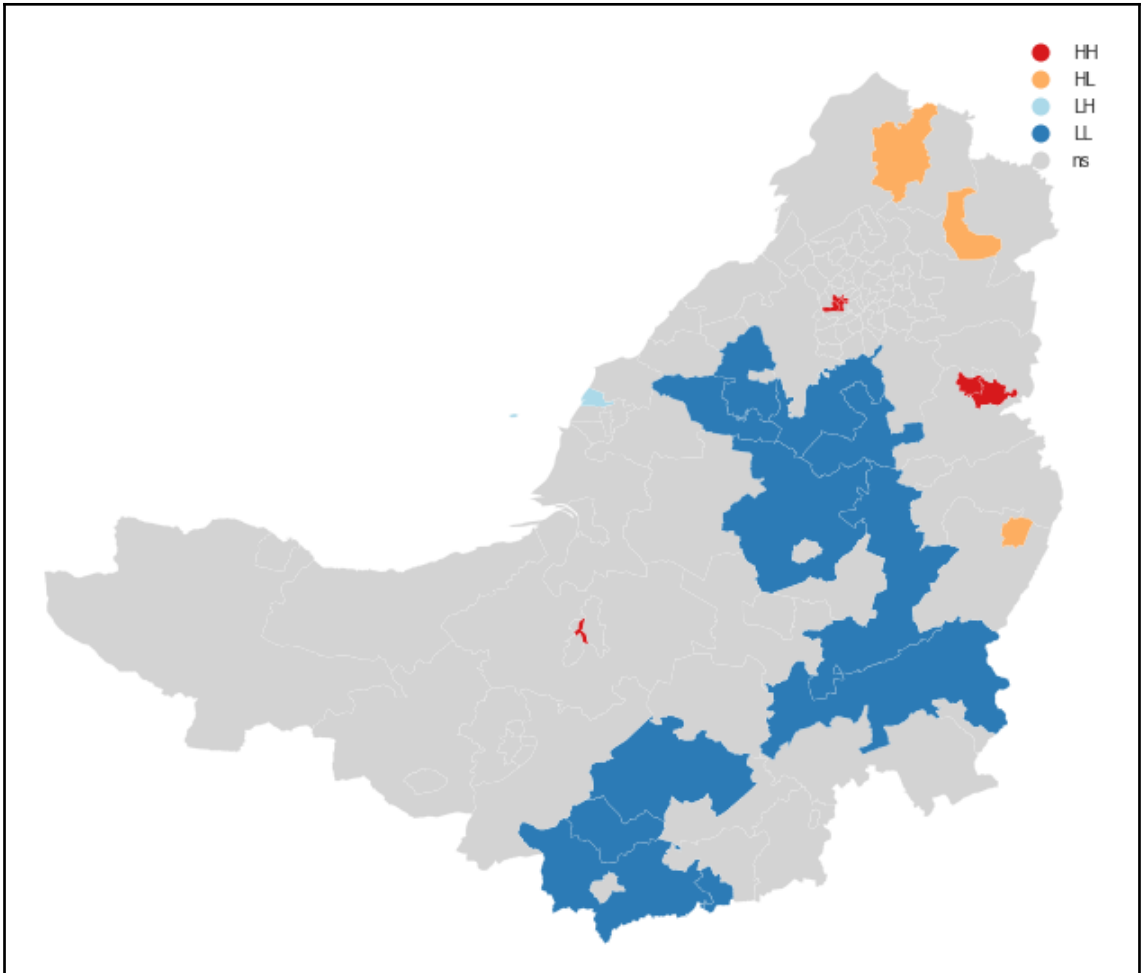
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1	AE036 Yeovil	Yeovil	AE - Somerset East	A - Somerset	POLYGON Z ((356464.40089999998 118237.8008999999...	251
2	AN010 Weston Villages	Worle	AN - Somerset North	A - Somerset	POLYGON Z ((339021.20179999999 162785.1024999999...	38
3	AW039 Sedgemoor North East	Sedgemoor	AW - Somerset West	A - Somerset	POLYGON Z ((339656.89609999995 156204.0963000000...	50
4	AE022 Wells Rural	Mendip West	AE - Somerset East	A - Somerset	POLYGON Z ((355607.20019999998 154700.5998 0, 3...	25



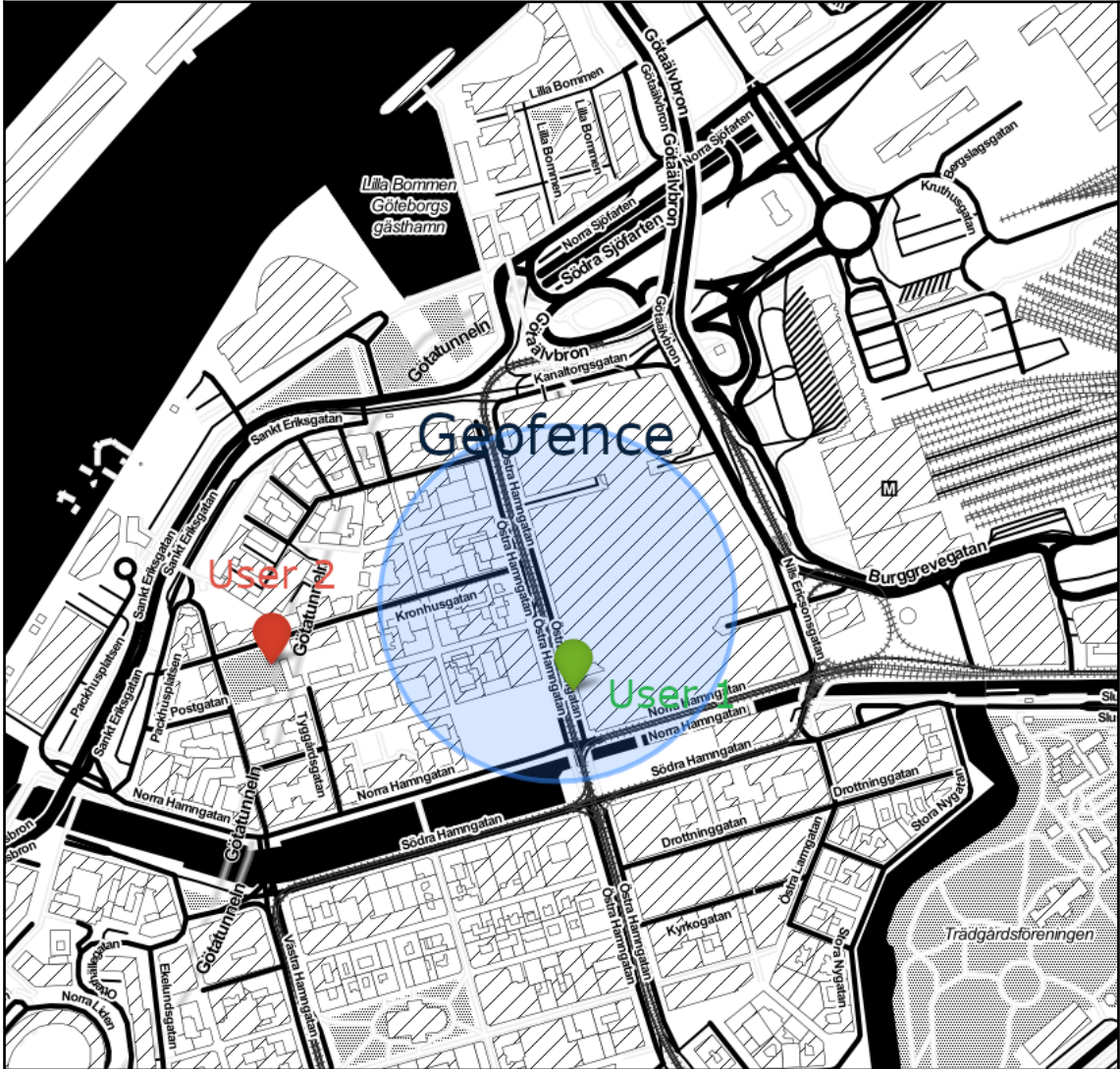




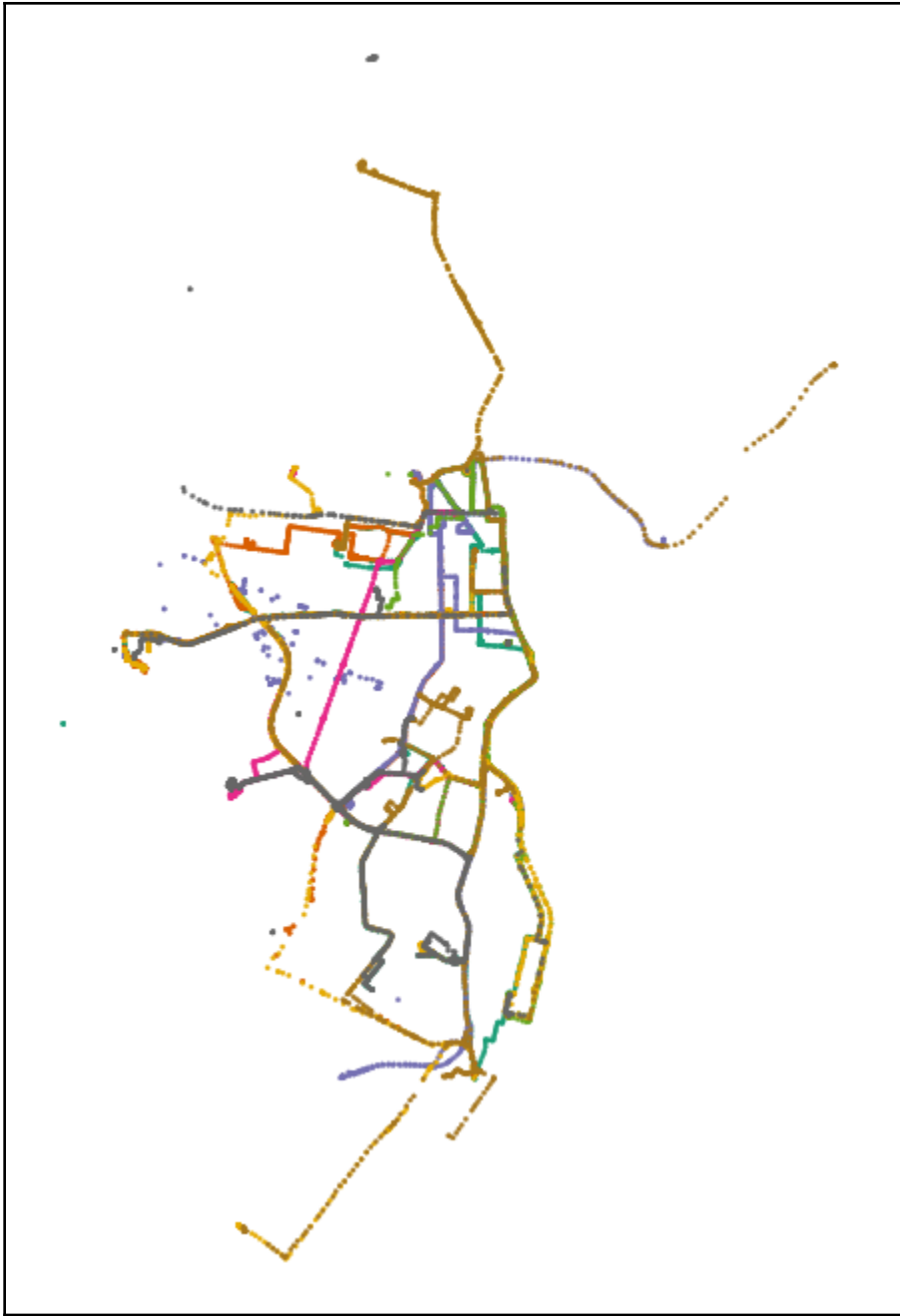


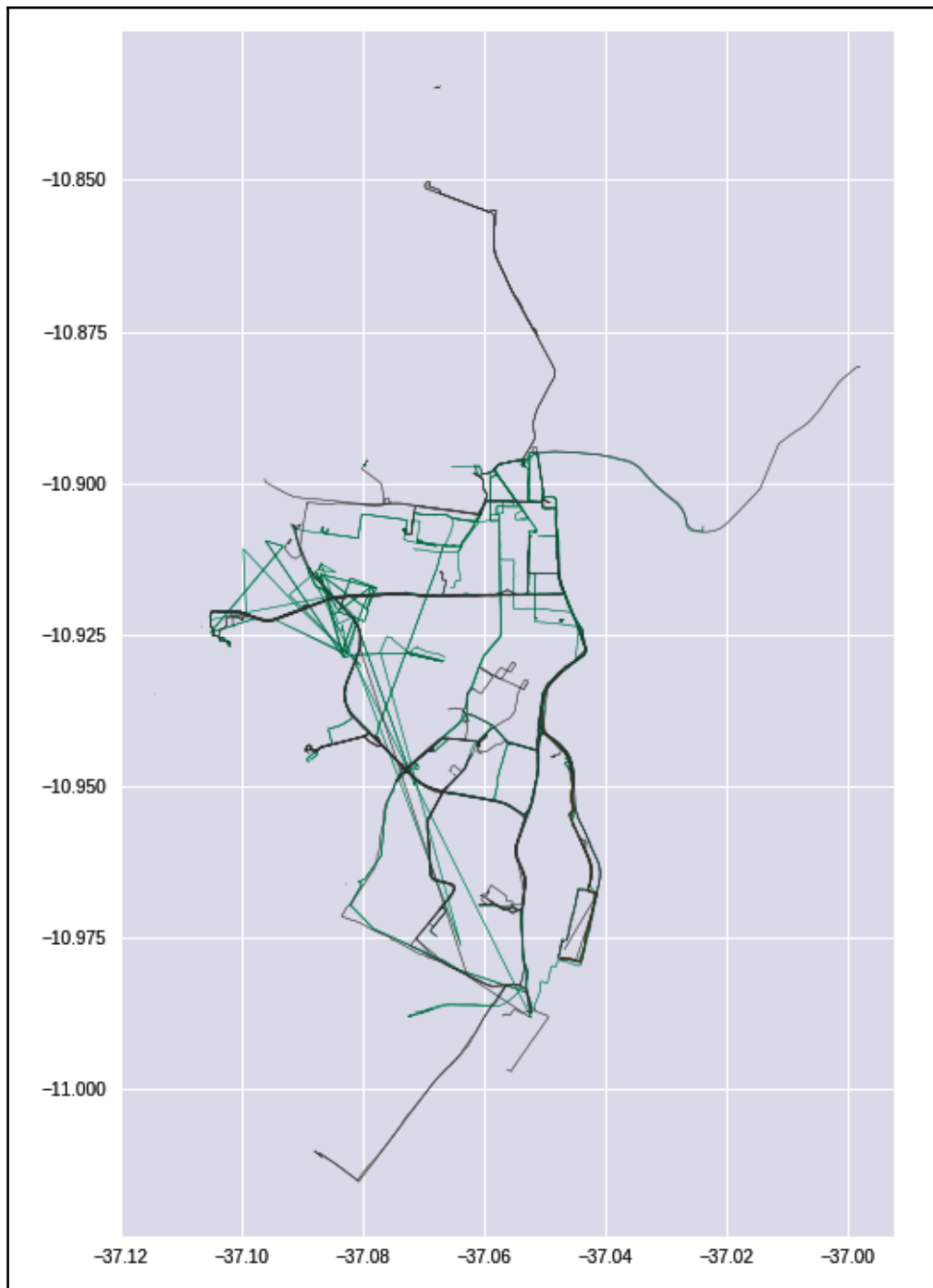


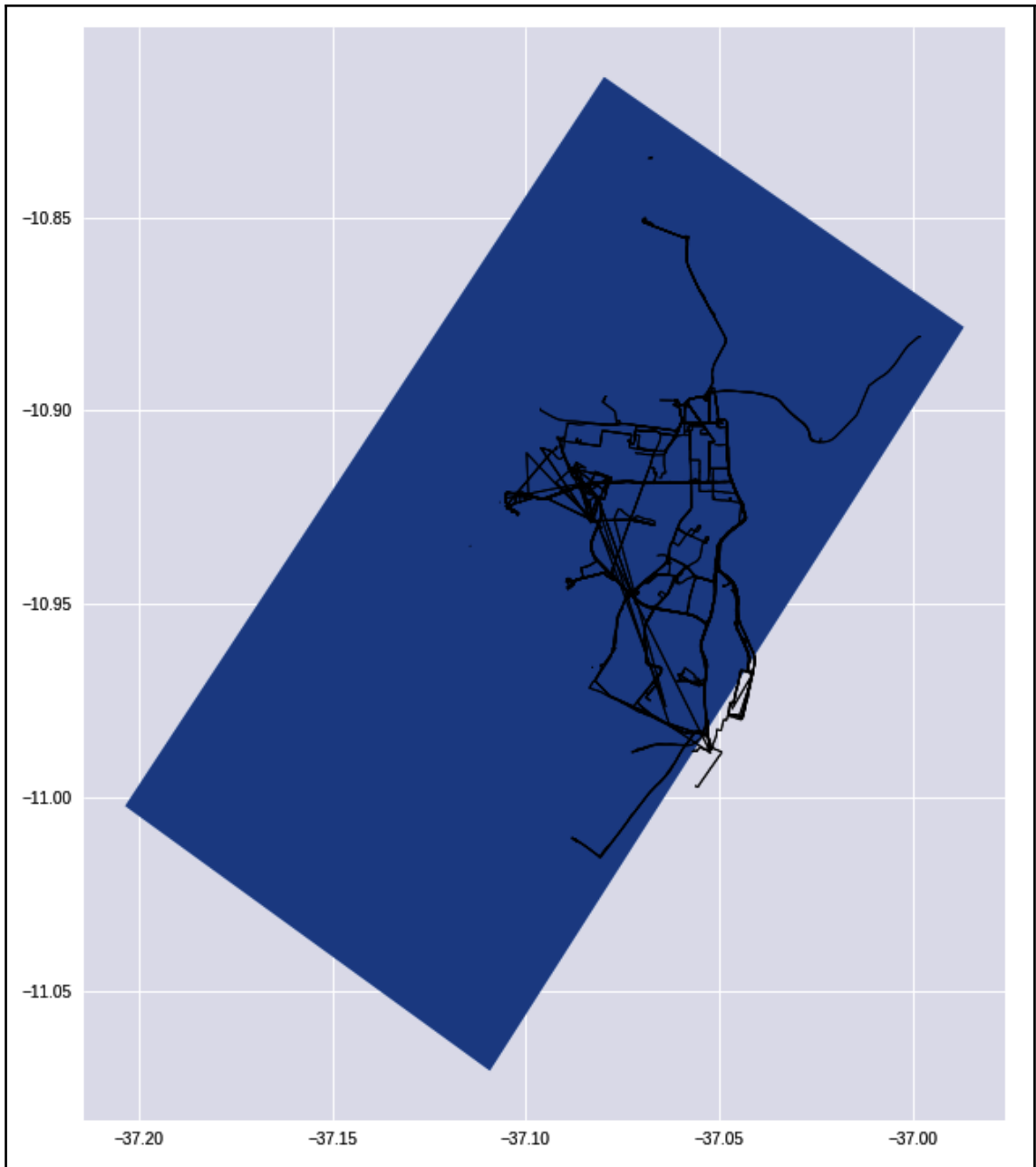
Chapter 5: Nudging Check-Ins with Geofences

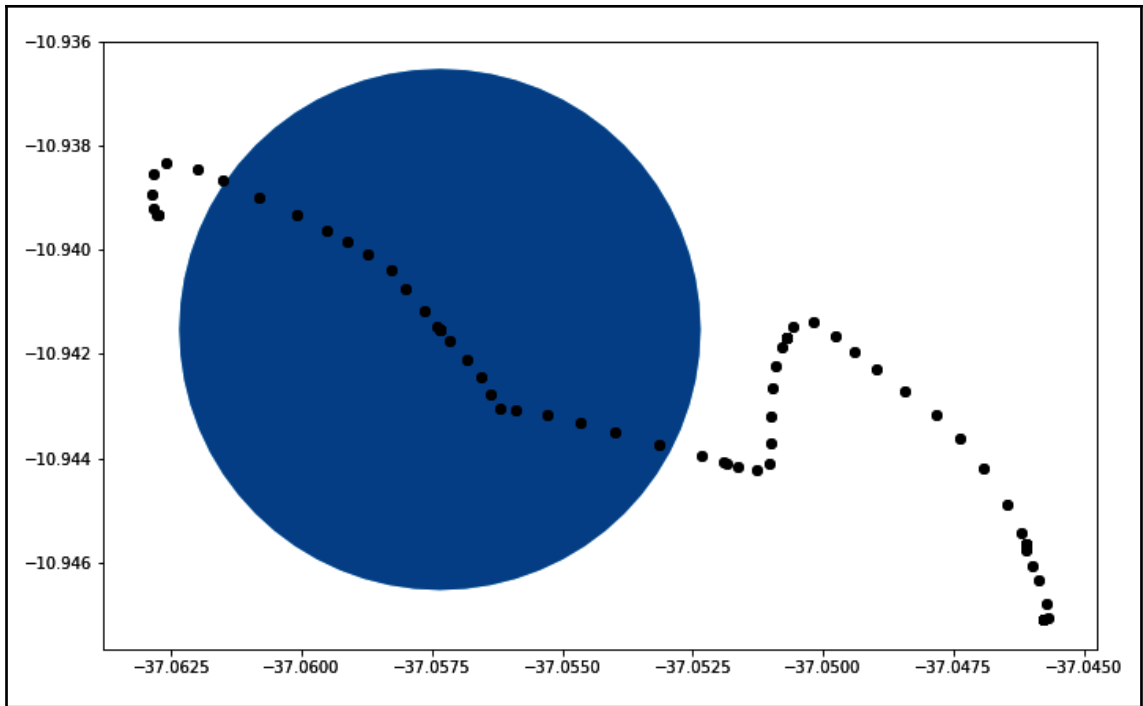


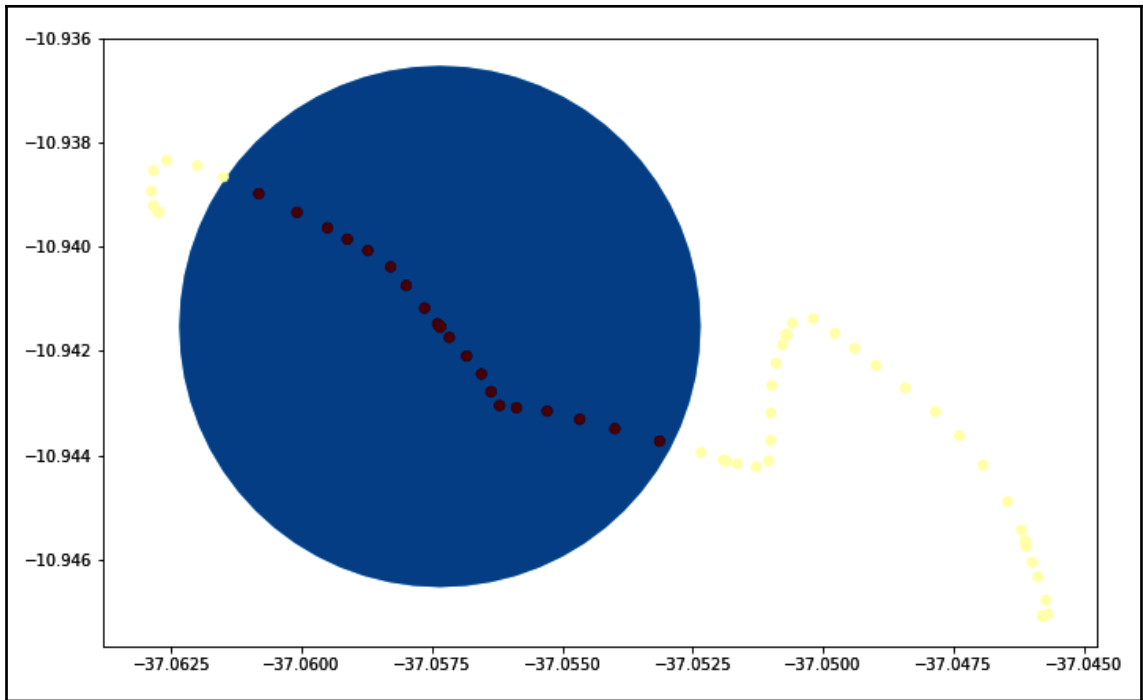
	id	latitude	longitude	track_id	time
0	1	-10.939341	-37.062742	1	2014-09-13 07:24:32
1	2	-10.939341	-37.062742	1	2014-09-13 07:24:37
2	3	-10.939324	-37.062765	1	2014-09-13 07:24:42
3	4	-10.939211	-37.062843	1	2014-09-13 07:24:47
4	5	-10.938939	-37.062879	1	2014-09-13 07:24:53



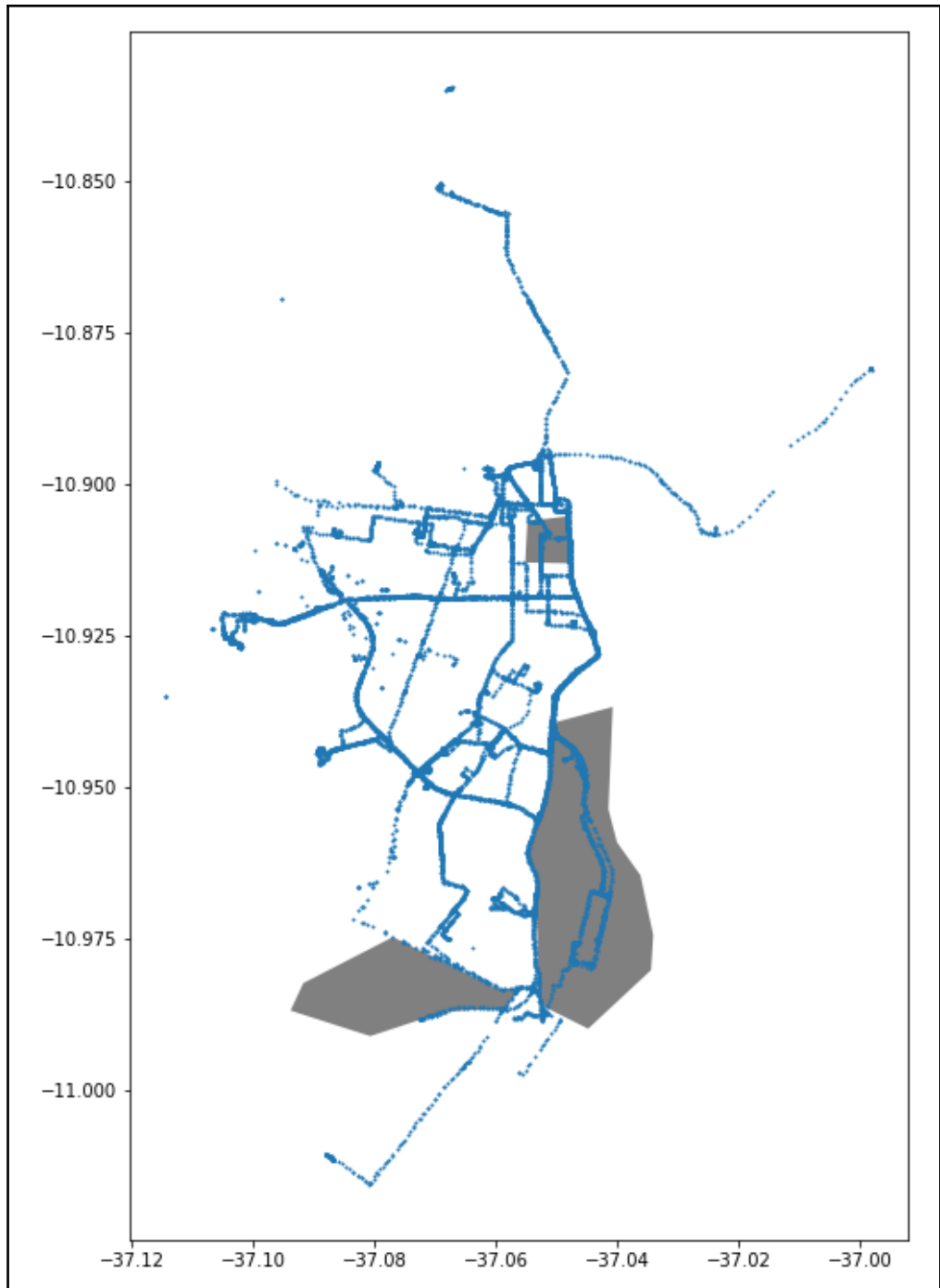


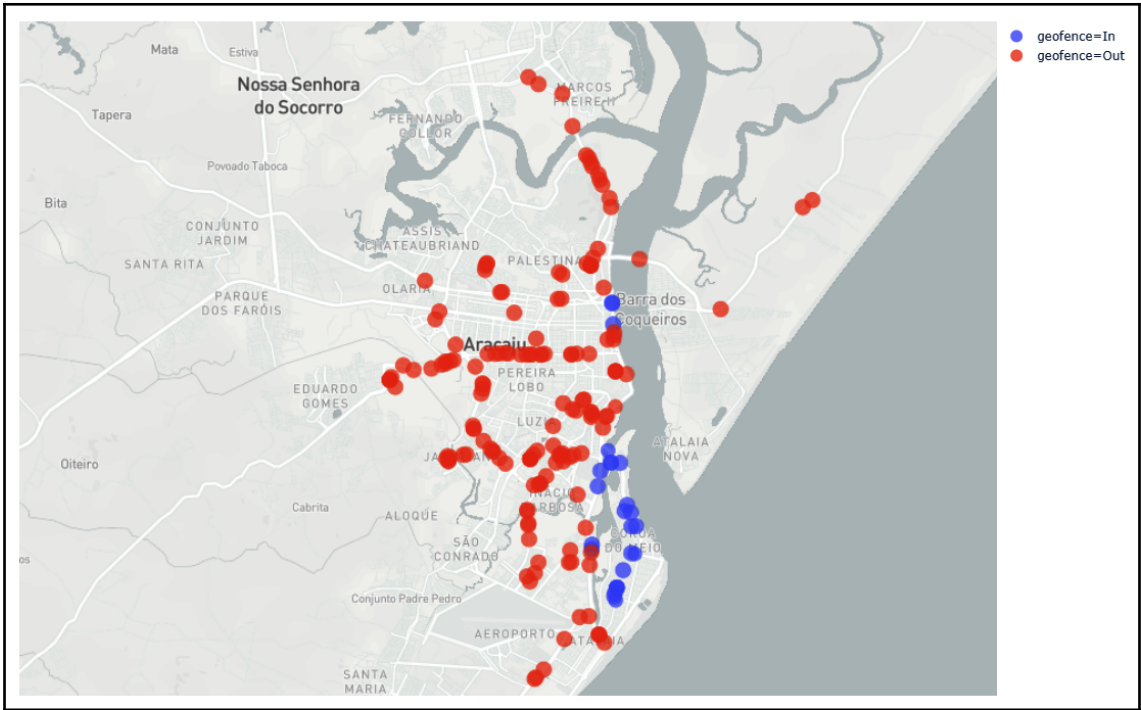




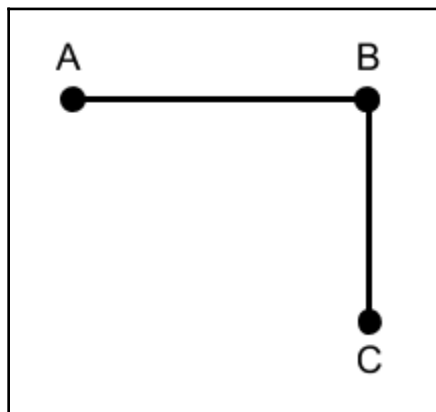
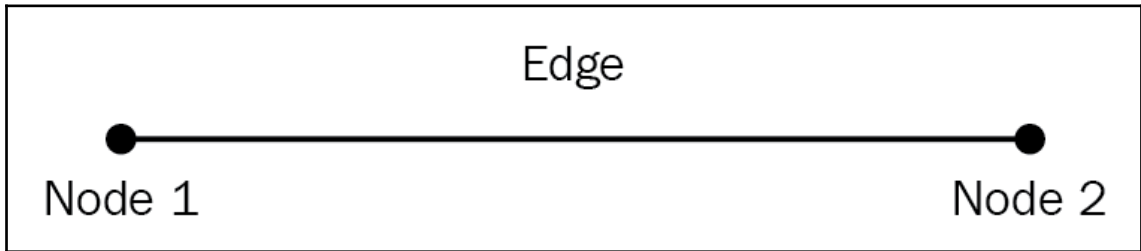


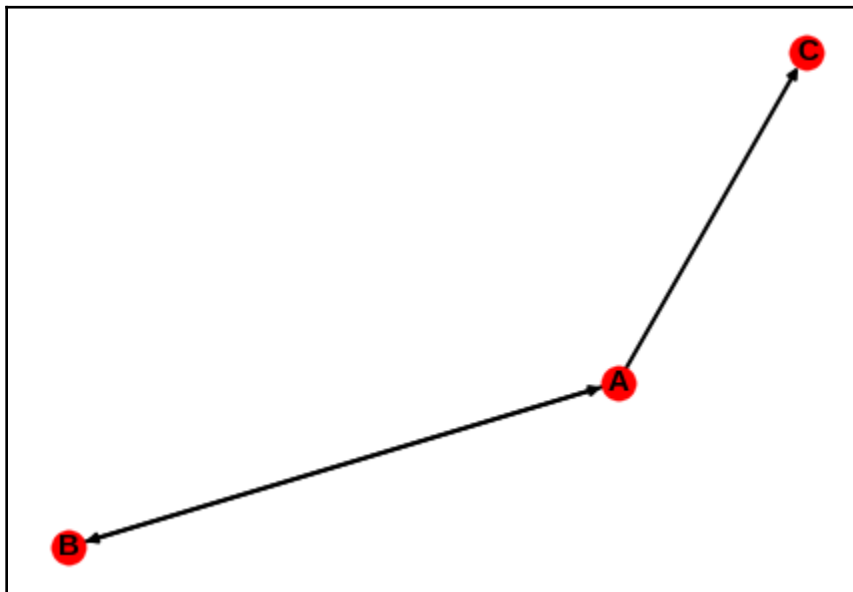
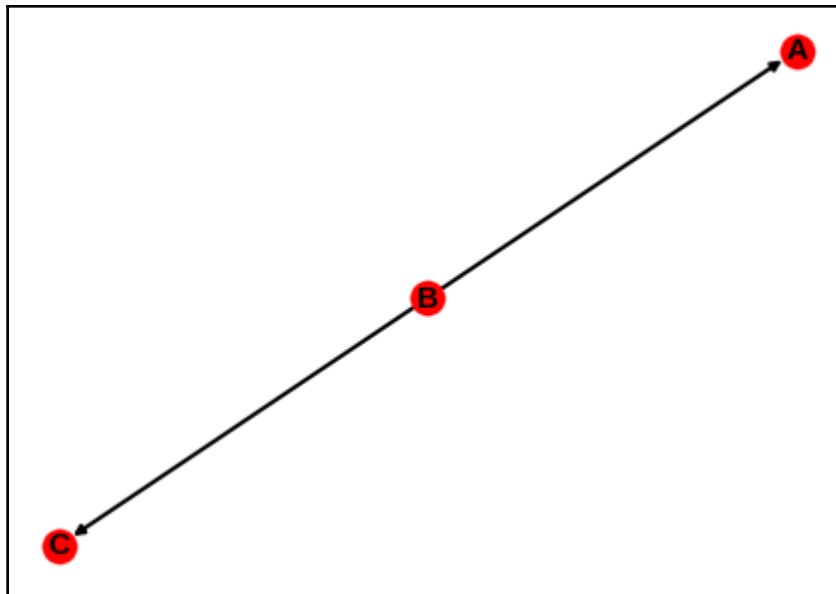
	id	name	geometry
0	1	Airport	(POLYGON ((-37.08070101133483 -10.990966514049...
1	2	Beach	(POLYGON ((-37.05289499526379 -10.985695231382...
2	3	Center	(POLYGON ((-37.05481681706964 -10.906043953908...

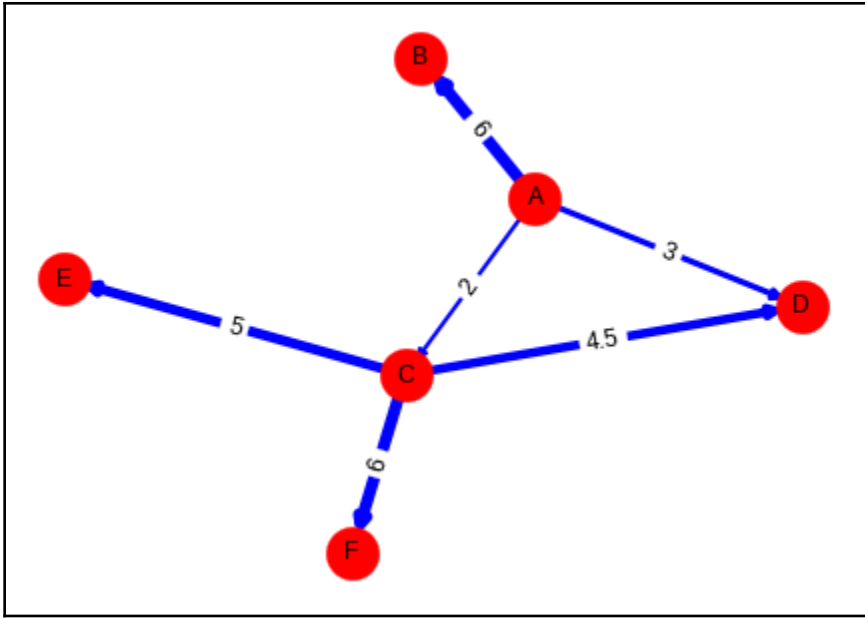


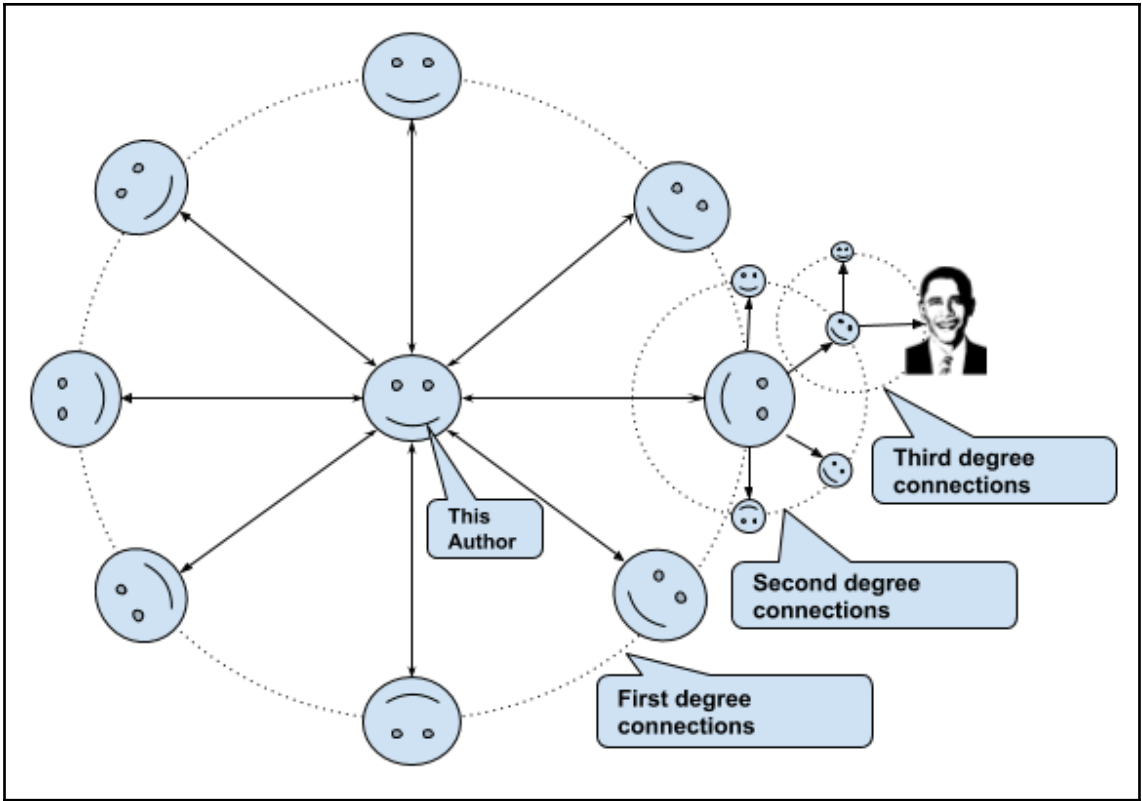


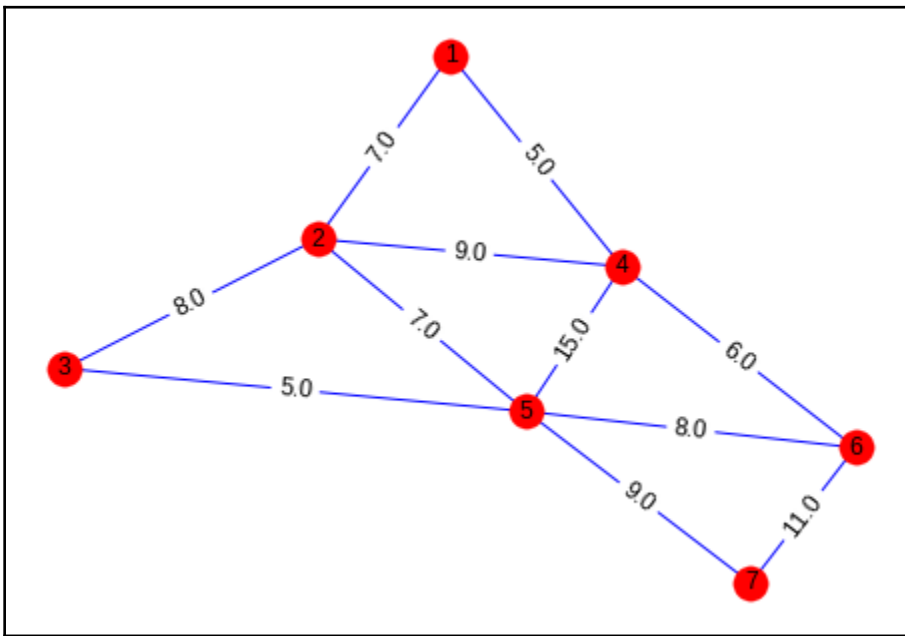
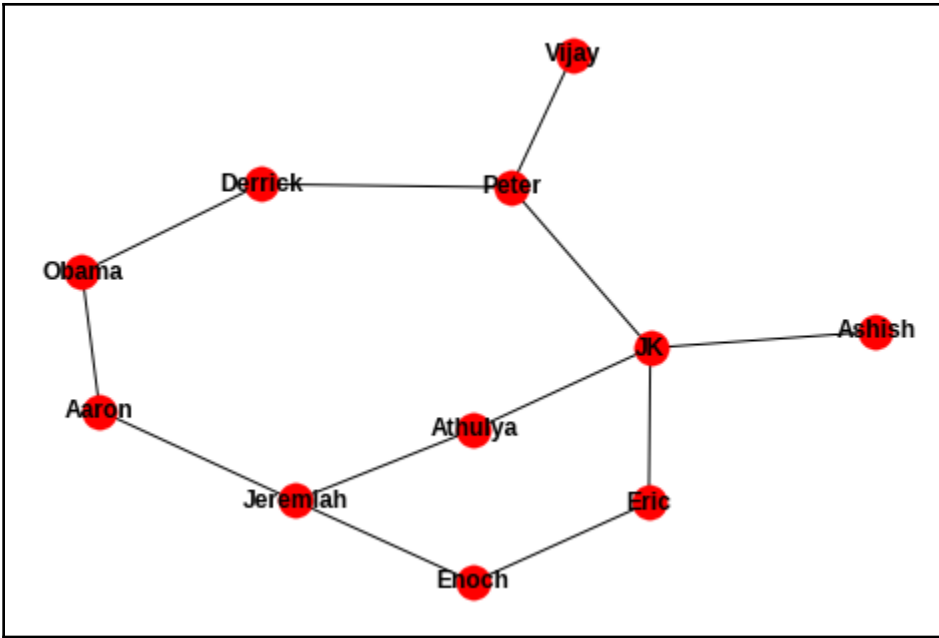
Chapter 6: Let's Build a Routing Engine











Signature: `nx.dijkstra_path_length(G, source, target, weight='weight')`

Docstring:

Returns the shortest weighted path length in G from source to target.

Uses Dijkstra's Method to compute the shortest weighted path length between two nodes in a graph.

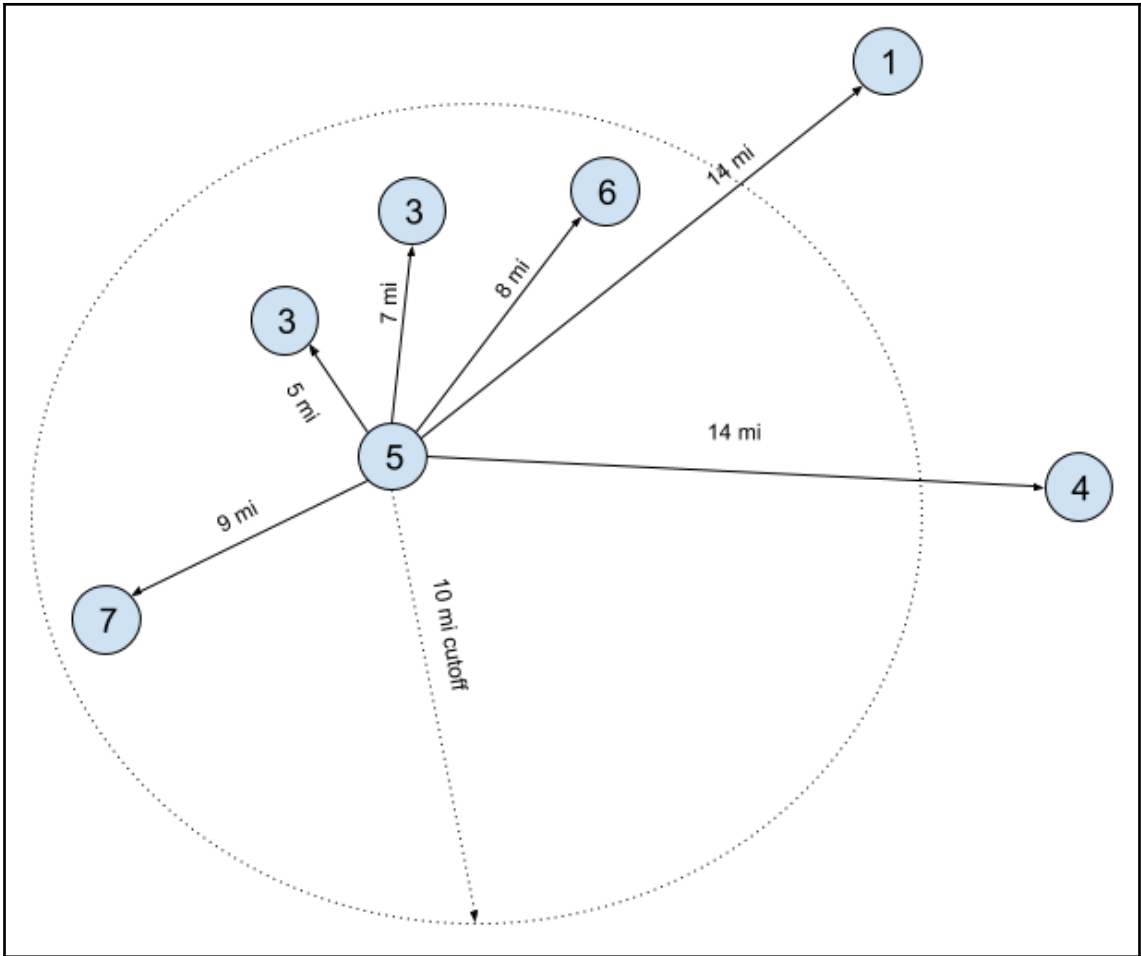
Parameters

G : NetworkX graph

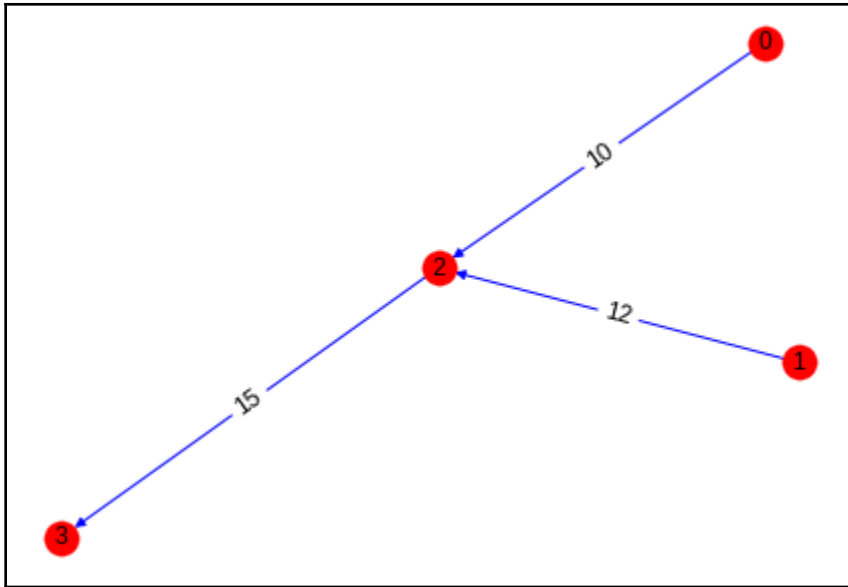
source : node label
starting node for path

target : node label
ending node for path

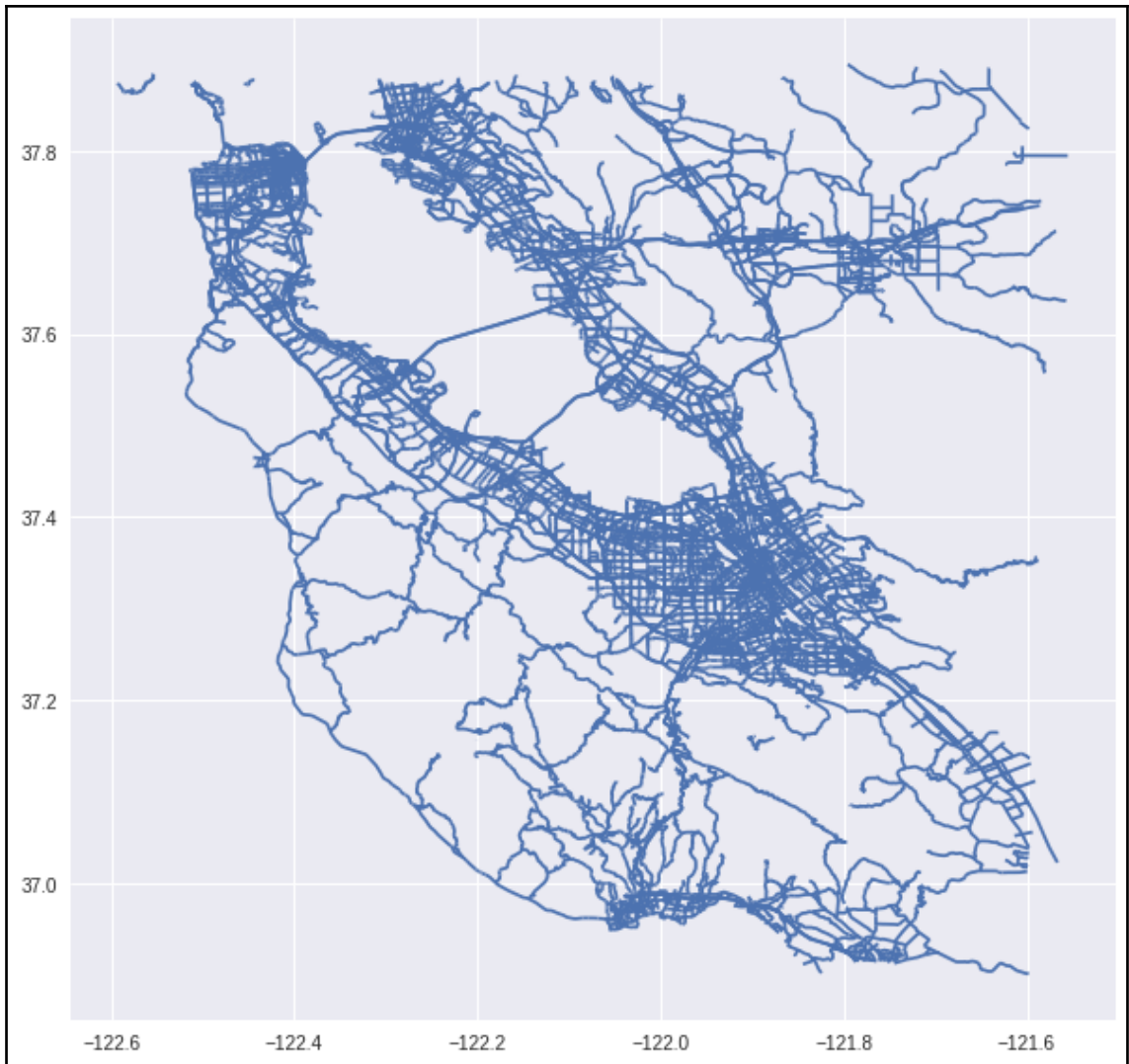
weight : string or function
If this is a string, then edge weights will be accessed via the edge attribute with this key (that is, the weight of the edge joining `u` to `v` will be ``G.edges[u, v][weight]``). If no such edge attribute exists, the weight of the edge is assumed to be one.

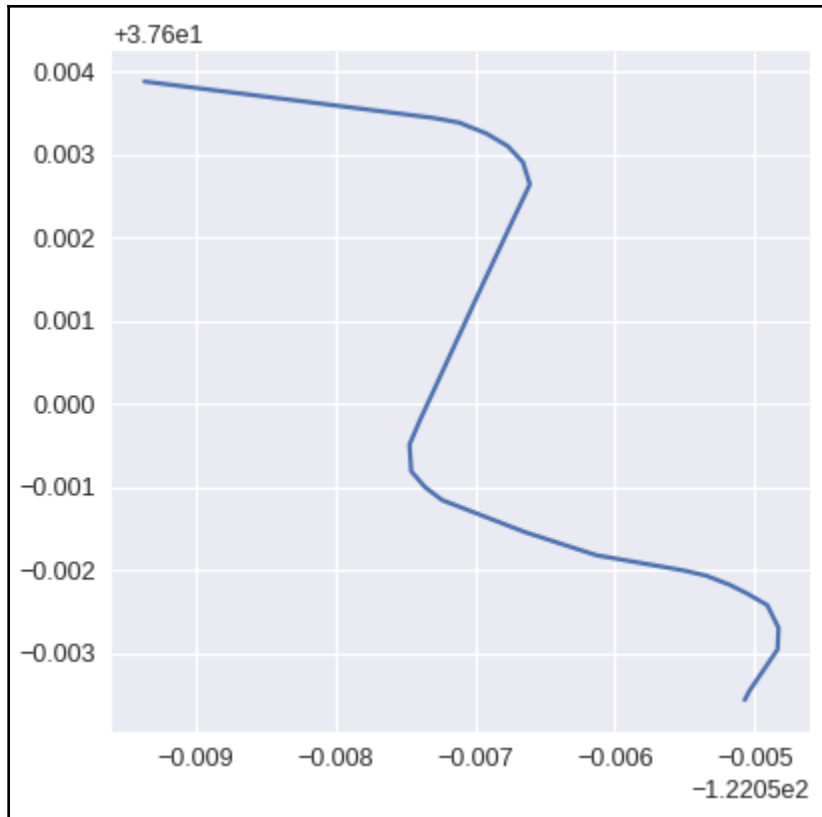


	dist	source	target	time
0	3	0	2	10
1	4	1	2	12
2	5	2	3	15



	osm_id	code	fclass	name	ref	oneway	maxspeed	layer	bridge	tunnel	geometry
54680	552616039	5115	tertiary	Alder Drive	None	F	64	0.0	F	F	LINestring (-121.9158012 37.4131651, -121.9158...
54681	552616040	5115	tertiary	Alder Drive	None	F	64	0.0	F	F	LINestring (-121.9161089 37.4132495, -121.9159...
54682	552616041	5115	tertiary	Alder Drive	None	F	64	0.0	F	F	LINestring (-121.9137148 37.4136598, -121.9135...
54683	552616042	5115	tertiary	Alder Drive	None	B	64	0.0	F	F	LINestring (-121.9137148 37.4136598, -121.9142...
54684	552616043	5115	tertiary	Alder Drive	None	F	64	0.0	F	F	LINestring (-121.9132784 37.4139034, -121.9136...

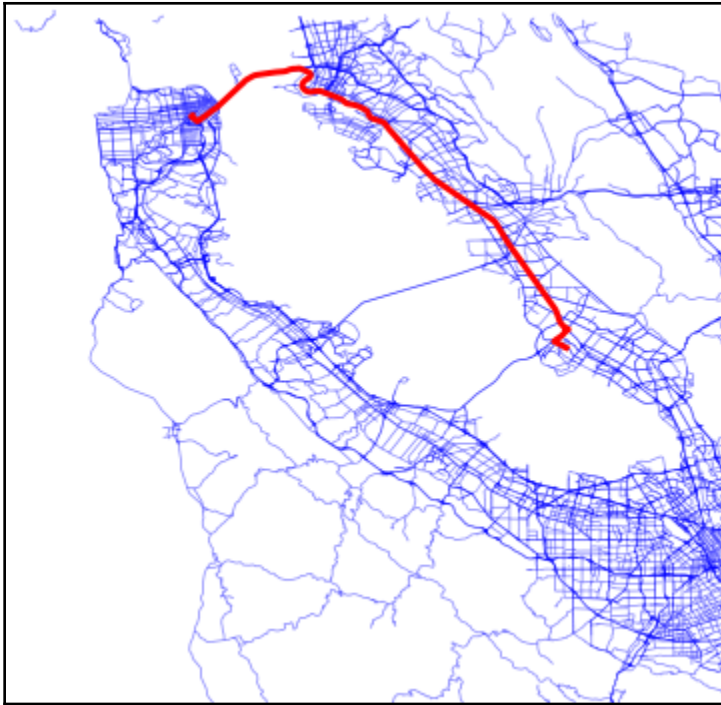


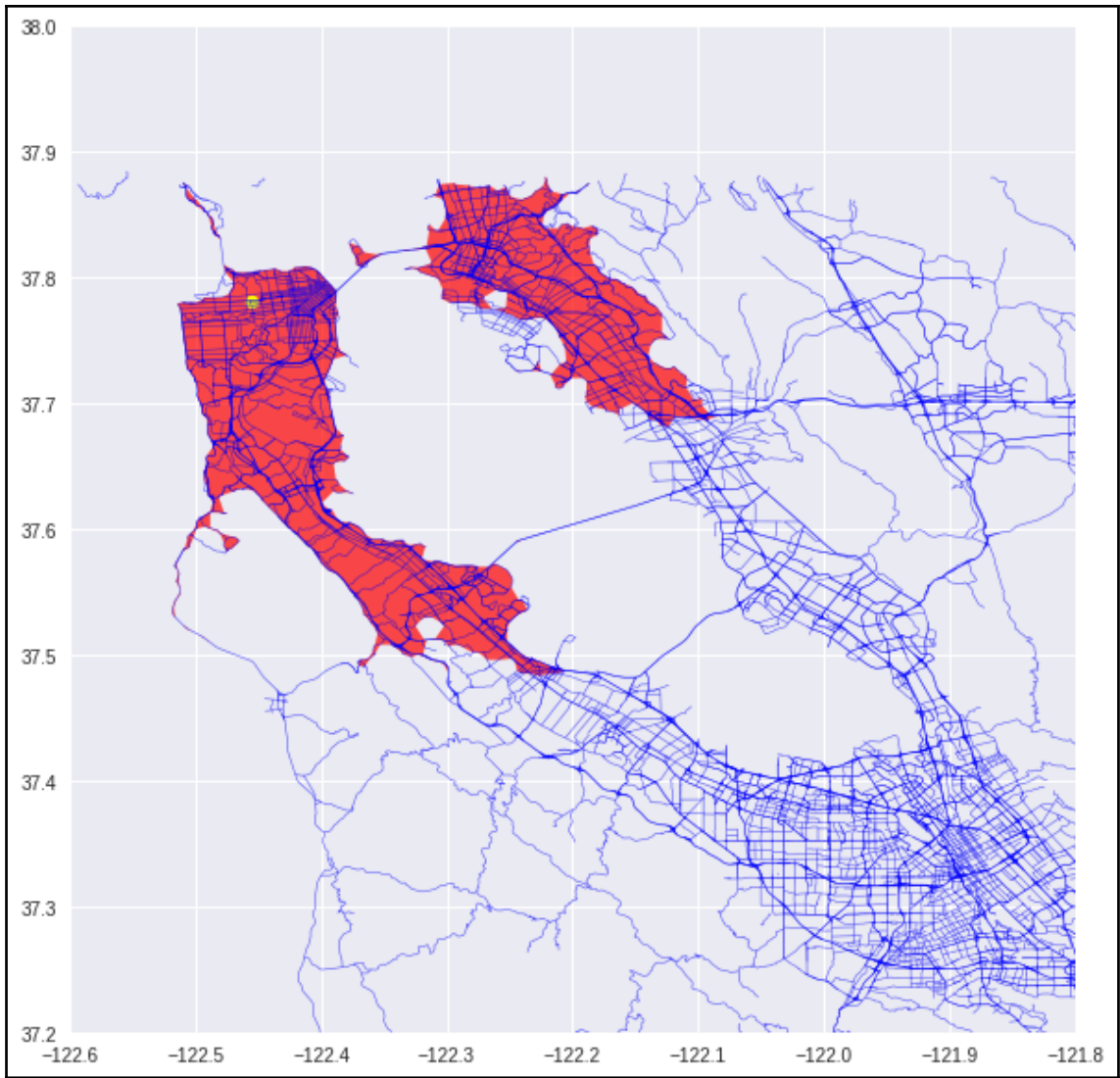


	osm_id	code	fclass	name	ref	oneway	maxspeed	layer	bridge	tunnel	source	target
0	4304424	5134	secondary_link	None	None	F	0	1.0	T	F	(-122.0470346, 37.3867598)	(-122.0469872, 37.3867158)
1	4304424	5134	secondary_link	None	None	F	0	1.0	T	F	(-122.0469872, 37.3867158)	(-122.04691, 37.3866479)
2	4304424	5134	secondary_link	None	None	F	0	1.0	T	F	(-122.04691, 37.3866479)	(-122.046828, 37.3865875)
3	4304424	5134	secondary_link	None	None	F	0	1.0	T	F	(-122.046828, 37.3865875)	(-122.0467464, 37.3865318)
4	4304424	5134	secondary_link	None	None	F	0	1.0	T	F	(-122.0467464, 37.3865318)	(-122.0466566, 37.3864817)

1 edge_df.tail()

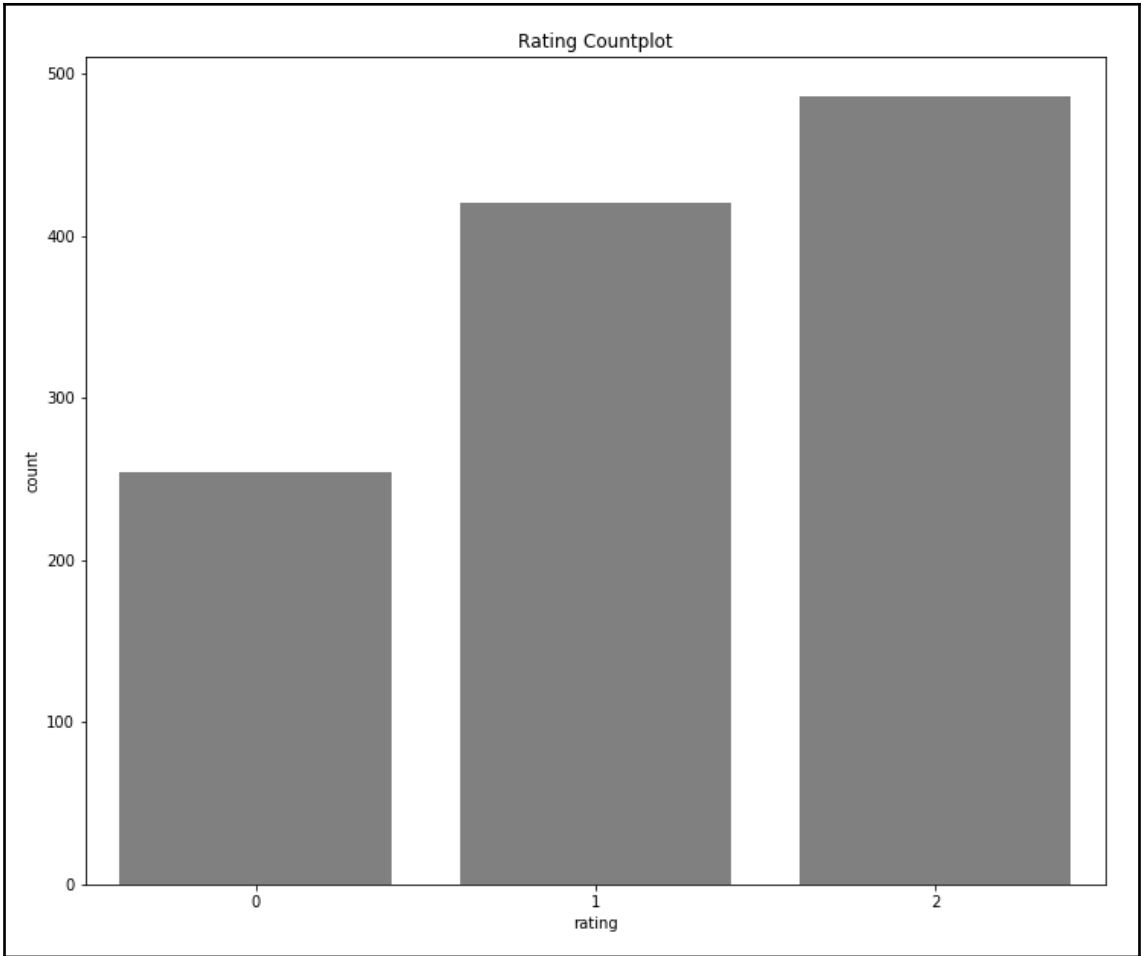
	osm_id	code	fclass	name	ref	oneway	maxspeed	layer	bridge	tunnel	source	target	dist	time
386708	397809208	5115	tertiary	Shell Parkway	None	T	48.000	0.0	F	F	(-122.2421439, 37.5333335)	(-122.2421439, 37.5333335)	12.434469	0.932585
386709	415826593	5114	secondary	Fruitdale Avenue	None	T	56.315	0.0	F	F	(-121.9190164, 37.3106507)	(-121.9190164, 37.3106507)	48.007237	3.068917
386710	415826593	5114	secondary	Fruitdale Avenue	None	T	56.315	0.0	F	F	(-121.9191539, 37.310704)	(-121.9191539, 37.310704)	13.542958	0.865749
386711	417320442	5115	tertiary	Shell Parkway	None	T	48.000	0.0	F	F	(-122.2437675, 37.5349605)	(-122.2437675, 37.5349605)	12.457199	0.934290
386712	417320453	5115	tertiary	Shell Parkway	None	T	48.000	0.0	F	F	(-122.2438693, 37.535038)	(-122.2438693, 37.535038)	22.787404	1.709055





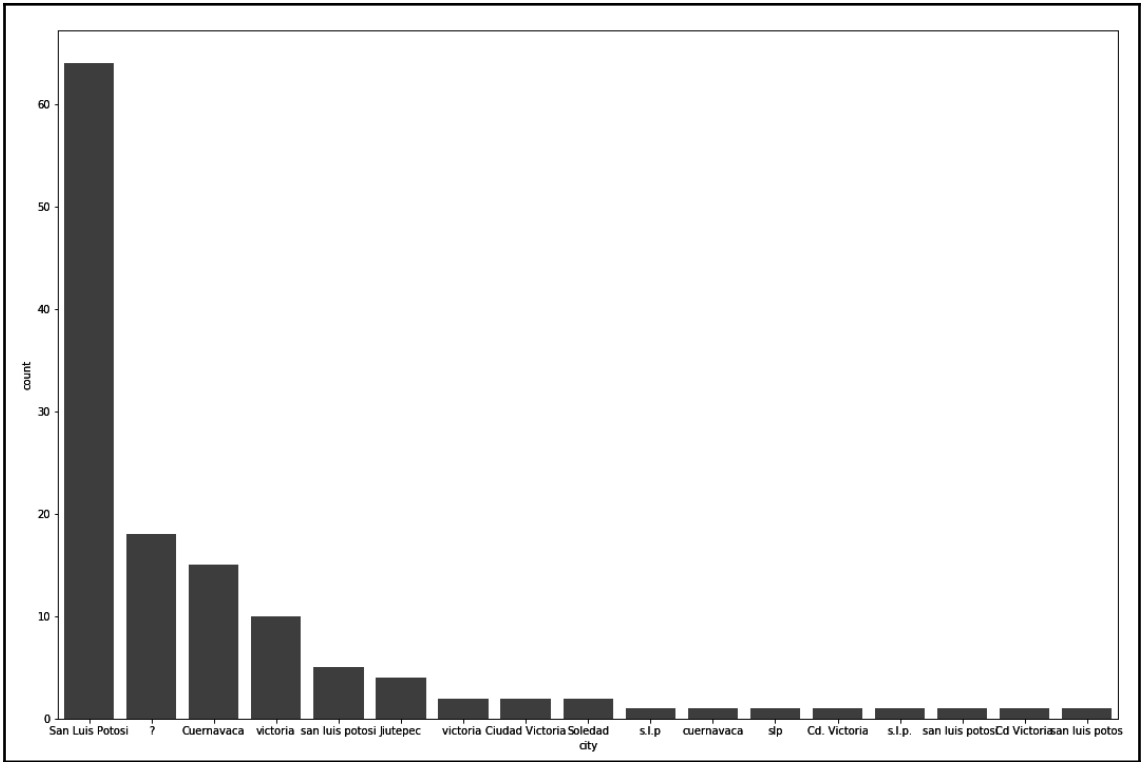
Chapter 7: Getting Location Recommender Systems

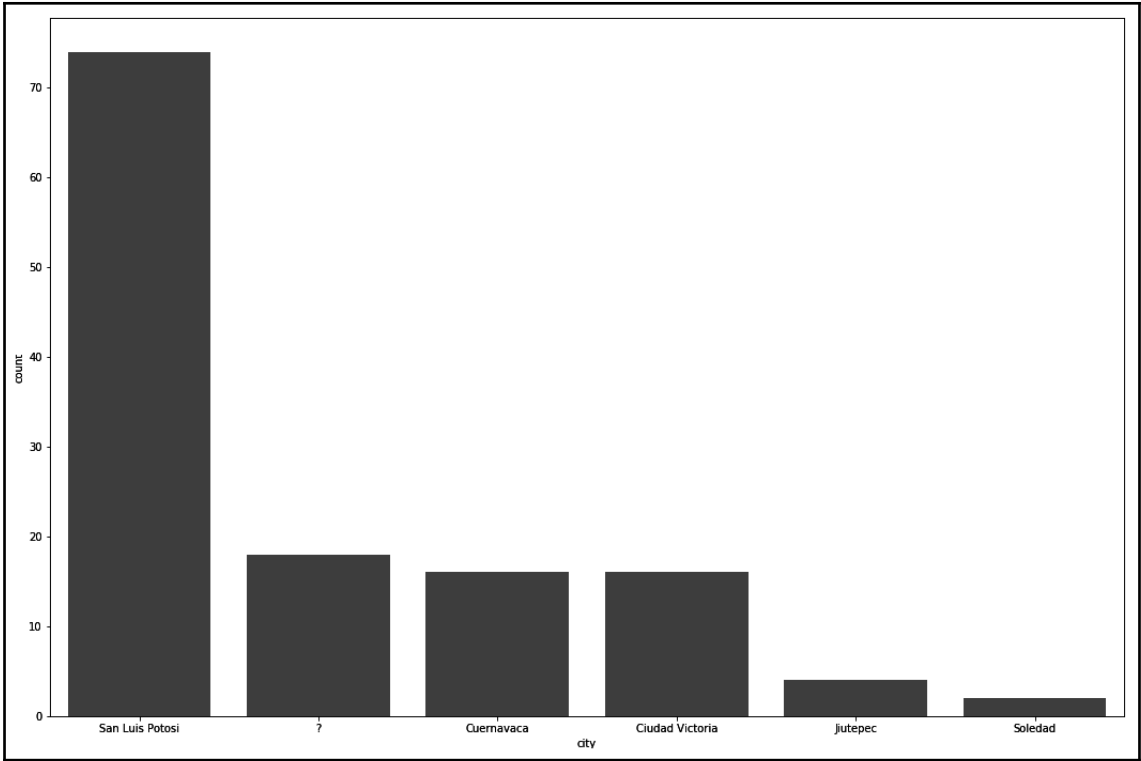
	userID	placeID	rating	food_rating	service_rating
0	U1077	135085	2	2	2
1	U1077	135038	2	2	1
2	U1077	132825	2	2	2
3	U1077	135060	1	2	2
4	U1068	135104	1	1	2

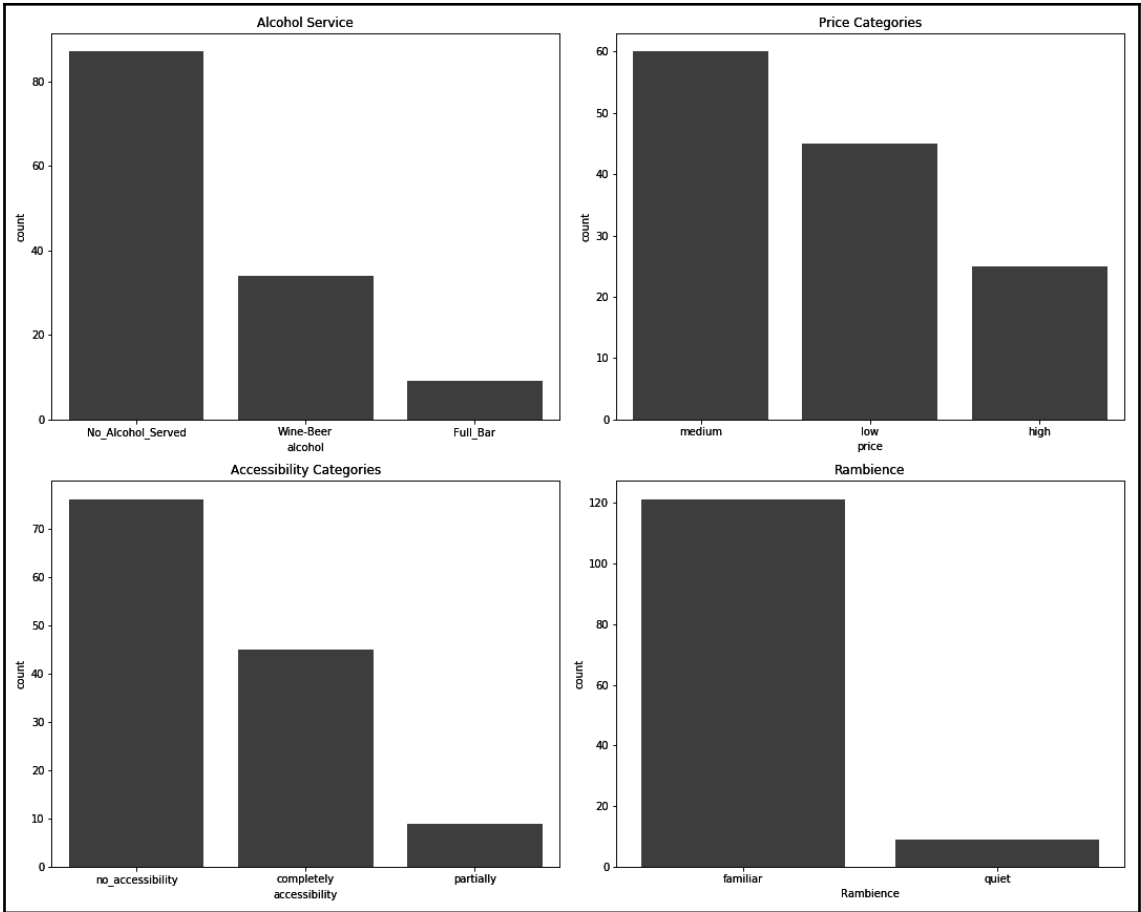


	0	1
placeID	134999	132825
latitude	18.9154	22.1474
longitude	-99.1849	-100.983
the_geom_meter	0101000020957F000088568DE356715AC138C0A525FC46...	0101000020957F00001AD016568C4858C1243261274BA5...
name	Kiku Cuernavaca	puesto de tacos
address	Revolucion	esquina santos degollado y leon guzman
city	Cuernavaca	s.l.p.
state	Morelos	s.l.p.
country	Mexico	mexico
fax	?	?
zip	?	78280
alcohol	No_Alcohol_Served	No_Alcohol_Served
smoking_area	none	none
dress_code	informal	informal
accessibility	no_accessibility	completely
price	medium	low
url	kikucuernavaca.com.mx	?
Rambience	familiar	familiar
franchise	f	f
area	closed	open
other_services	none	none
geometry	POINT (-99.184871 18.915421)	POINT (-100.983092 22.1473922)









	test_rmse	test_mae	fit_time	test_time
Algorithm				
SVDpp	0.657078	0.549815	0.211962	0.006811
KNNWithMeans	0.661444	0.497731	0.003141	0.006092
SVD	0.666097	0.565743	0.062267	0.003131
KNNWithZScore	0.677907	0.502996	0.008874	0.006949
BaselineOnly	0.691530	0.595164	0.003867	0.001565
CoClustering	0.696392	0.516317	0.034050	0.001619
NMF	0.718128	0.549835	0.075321	0.001678

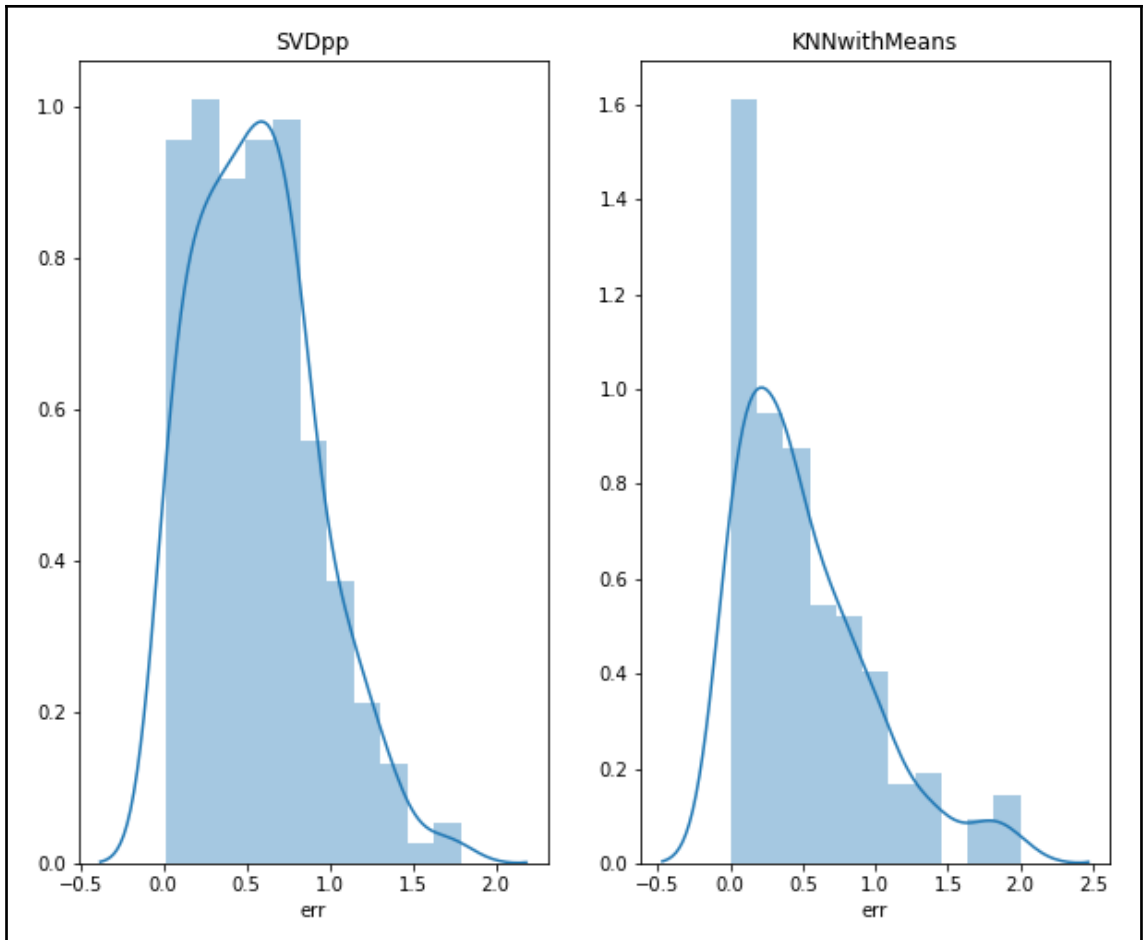
	uid	iid	rui	est	details
0	U1040	134999	1.0	0.983333	{'actual_k': 2, 'was_impossible': False}
1	U1032	135042	0.0	1.239111	{'actual_k': 12, 'was_impossible': False}
2	U1061	135058	1.0	1.420927	{'actual_k': 9, 'was_impossible': False}
3	U1118	134992	0.0	0.000000	{'actual_k': 2, 'was_impossible': False}
4	U1019	132856	0.0	0.000000	{'actual_k': 11, 'was_impossible': False}

	uid	iid	rui	est	details	err
0	U1040	134999	1.0	0.983333	{'actual_k': 2, 'was_impossible': False}	0.016667
1	U1032	135042	0.0	1.239111	{'actual_k': 12, 'was_impossible': False}	1.239111
2	U1061	135058	1.0	1.420927	{'actual_k': 9, 'was_impossible': False}	0.420927
3	U1118	134992	0.0	0.000000	{'actual_k': 2, 'was_impossible': False}	0.000000
4	U1019	132856	0.0	0.000000	{'actual_k': 11, 'was_impossible': False}	0.000000

	uid	iid	rui	est	details	err
0	U1040	134999	1.0	1.215454	{'was_impossible': False}	0.215454
1	U1032	135042	0.0	1.300336	{'was_impossible': False}	1.300336
2	U1061	135058	1.0	1.388325	{'was_impossible': False}	0.388325
3	U1118	134992	0.0	0.758690	{'was_impossible': False}	0.758690
4	U1019	132856	0.0	0.232720	{'was_impossible': False}	0.232720

	uid	iid	rui	est	details	err
210	U1115	135054	0.0	1.644838	{'actual_k': 8, 'was_impossible': False}	1.644838
38	U1015	132866	0.0	1.711111	{'actual_k': 4, 'was_impossible': False}	1.711111
80	U1134	135026	0.0	1.711875	{'actual_k': 6, 'was_impossible': False}	1.711875
113	U1036	135065	0.0	1.757241	{'actual_k': 6, 'was_impossible': False}	1.757241
205	U1030	135016	0.0	1.833333	{'actual_k': 1, 'was_impossible': False}	1.833333
43	U1048	135048	0.0	1.839773	{'actual_k': 2, 'was_impossible': False}	1.839773
41	U1023	132733	2.0	0.151786	{'actual_k': 3, 'was_impossible': False}	1.848214
175	U1014	135082	0.0	1.884457	{'actual_k': 5, 'was_impossible': False}	1.884457
59	U1118	135021	2.0	0.000000	{'actual_k': 4, 'was_impossible': False}	2.000000
142	U1116	135059	0.0	2.000000	{'actual_k': 7, 'was_impossible': False}	2.000000

	uid	iid	rui	est	details	err
194	U1027	135066	0.0	1.260576	{'was_impossible': False}	1.260576
1	U1032	135042	0.0	1.300336	{'was_impossible': False}	1.300336
97	U1005	135043	0.0	1.308369	{'was_impossible': False}	1.308369
175	U1014	135082	0.0	1.341835	{'was_impossible': False}	1.341835
210	U1115	135054	0.0	1.381919	{'was_impossible': False}	1.381919
43	U1048	135048	0.0	1.396731	{'was_impossible': False}	1.396731
38	U1015	132866	0.0	1.413020	{'was_impossible': False}	1.413020
80	U1134	135026	0.0	1.591442	{'was_impossible': False}	1.591442
113	U1036	135065	0.0	1.686855	{'was_impossible': False}	1.686855
142	U1116	135059	0.0	1.794109	{'was_impossible': False}	1.794109



	userID	latitude	longitude	placeID	cluster
96	U1022	22.156883	-100.978485	135060	21
802	U1005	22.151060	-100.977659	135041	3
109	U1098	22.156883	-100.978485	135060	21
669	U1126	22.140129	-100.944872	135069	8
859	U1009	22.145108	-100.989547	135059	12
484	U1065	23.726819	-99.126506	132561	10
228	U1011	23.730925	-99.145185	132564	23
645	U1056	22.153703	-100.979033	135062	21
768	U1019	22.150849	-100.939752	132830	8
1053	U1052	22.141238	-100.923925	132869	4

