



A REEXAMINATION OF A DOMINATING BUSINESS

THROUGH VARIOUS FREE AND OPEN SOURCE GIS SOFTWARE

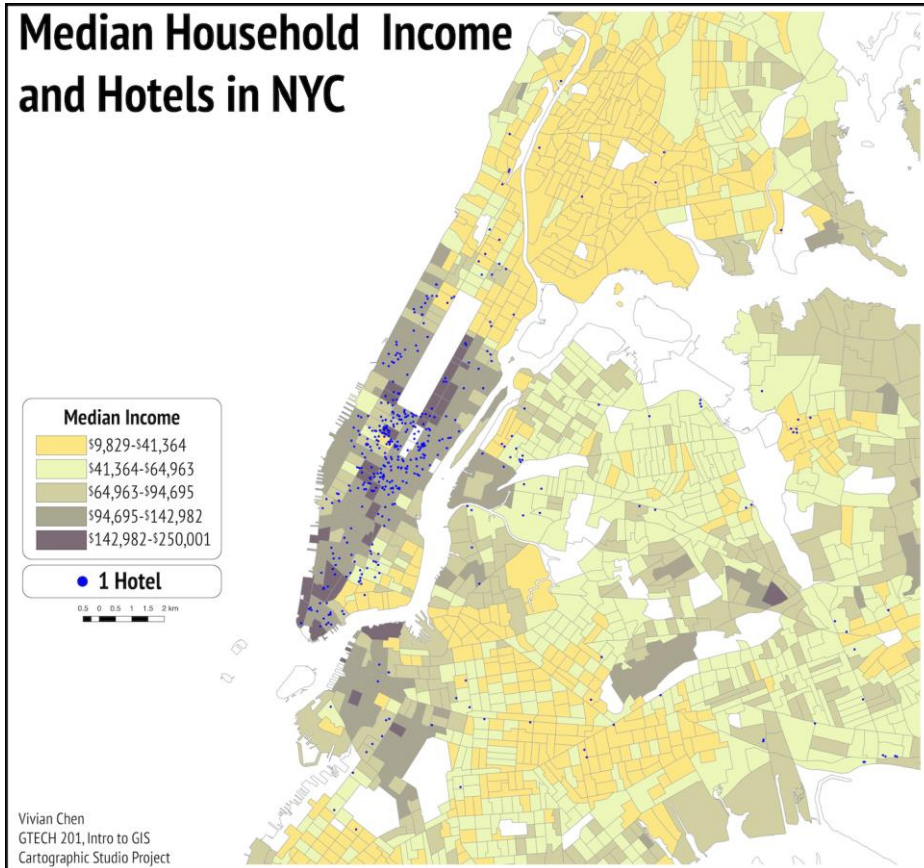
Vivian Chen

GTECH 38517, FOSS

Dr. Shipeng Sun, Fall 2018

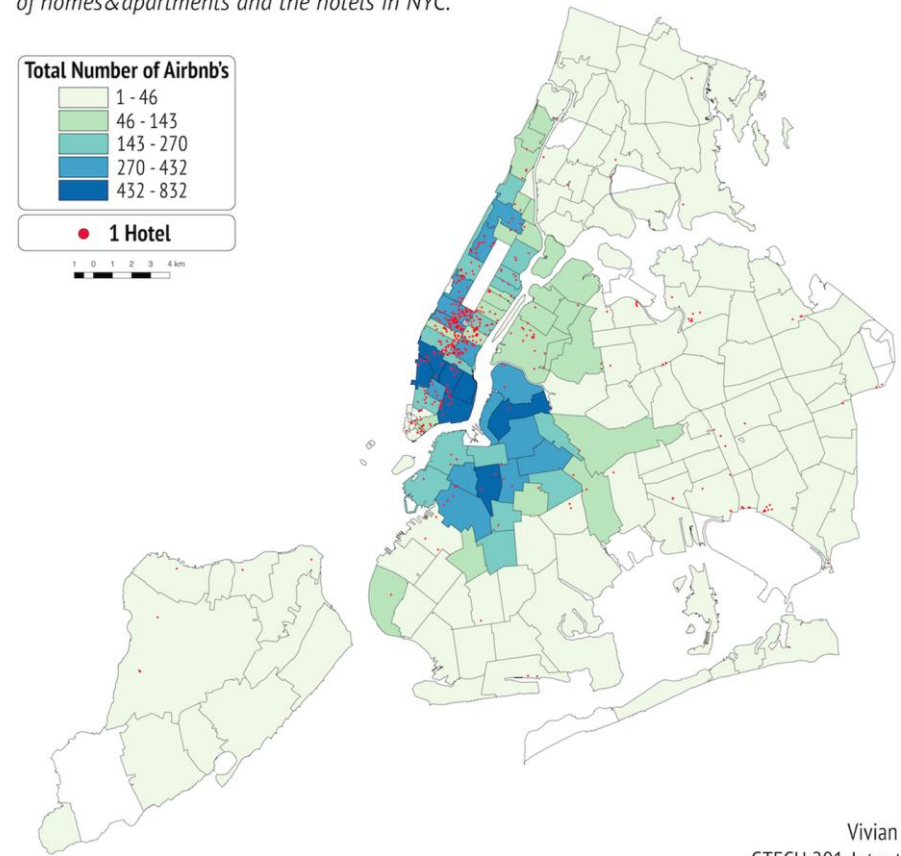
What is the relationship between the distribution of hotels and Airbnb rentals in New York City?

Median Household Income and Hotels in NYC



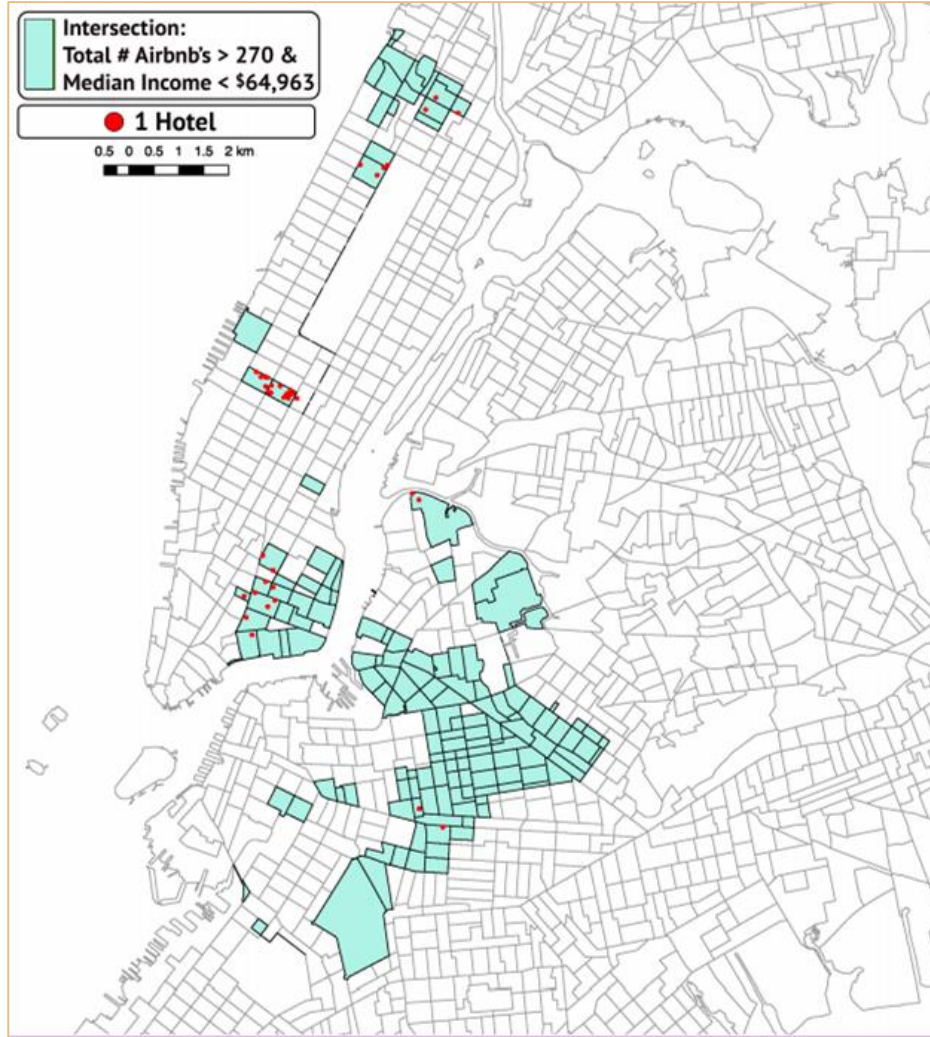
Airbnb Listings and Hotels in NYC

An analysis of the relationship between Airbnb listings of homes&apartments and the hotels in NYC.



Inside Airbnb, New York City listings April, 2017: <http://insideairbnb.com/get-the-data.html>
Wired New York, List of NYC Hotels: <http://wirednewyork.com/hotels/list/>

Vivian Chen
GTECH 201, Intro to GIS
Cartographic Studio Project



Intersection (A n B)

(A) # Airbnb's: 270 – 832

(B) Median Inc.: \$9,829 – \$64,963

Hotels: 44 Hotels → 8.5%

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- 10036: 22 hotels
- 10002 & 10003: 10 hotels
- Brooklyn: 4 hotels

Research Topic/Question

What is the relationship between the distribution of Airbnb listings and median household incomes in NYC?

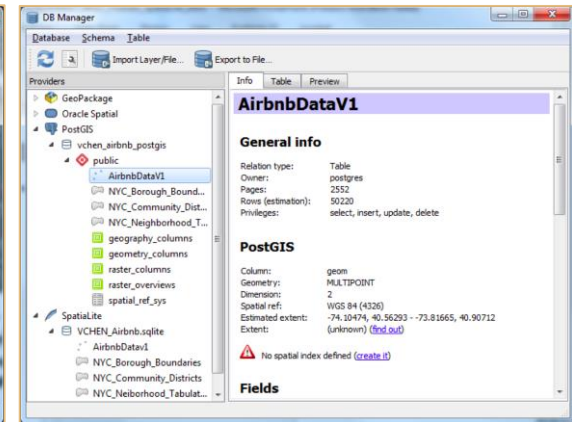
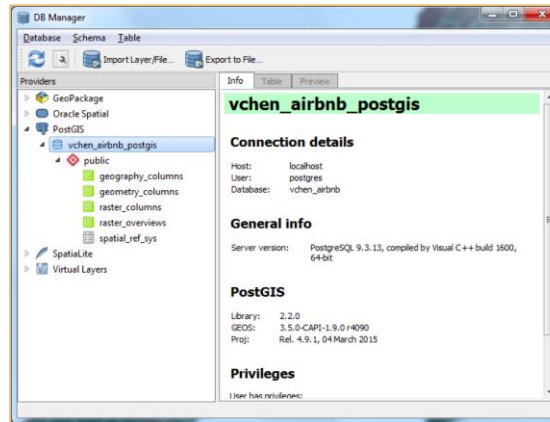


Data

Item Name	Notes	Format	Source
Airbnb Listings 10/07/2018	Tabular data of all Airbnb listings as of October 7, 2018 with Lon/Lat Coordinates	CSV file	Inside Airbnb – Get the Data
AirbnbDatav1	Point Data of Airbnb Listings 10/07/2018	Shapefile	Inside Airbnb – Get the Data
NYC Neighborhood Tabulation Areas	Polygonal boundaries of NYC neighborhood tabulation areas	Shapefile	NYC Department of City Planning
NYC Borough Boundaries	Polygonal boundaries of NYC borough boundaries	Shapefile	NYC Open Data
Median Income by NYC NTA	Polygonal boundaries of NYC census tracts containing median income data	Shapefile	U.S. Census Bureau, 2010, American Community Survey

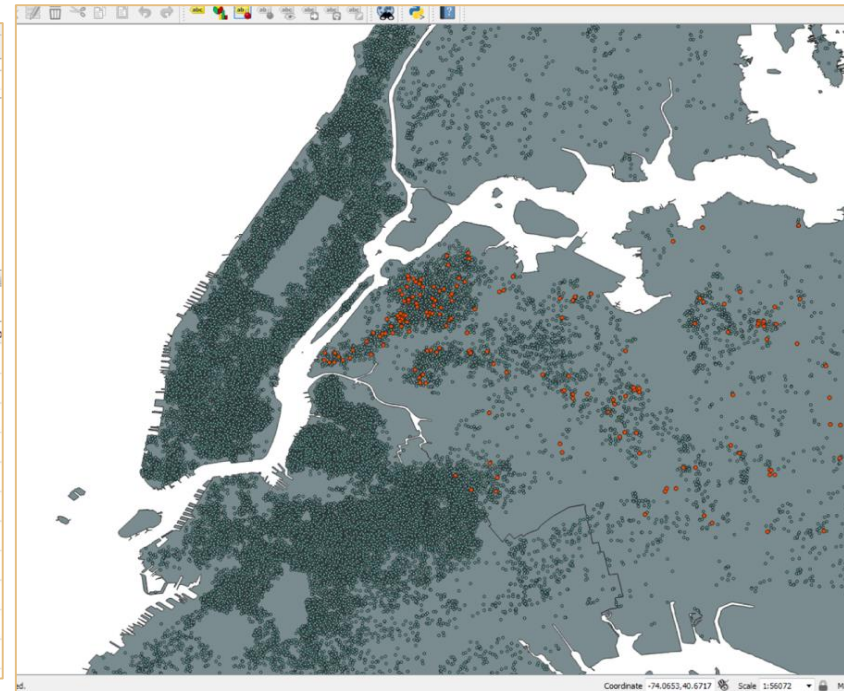
Assignment 1: QGIS Data Loading

- Identify/clean data
- Load onto Spatialite, PostGIS
- Geocoded Airbnb listings
- Sampled spatial SQL queries



The screenshot shows the QGIS Query Builder window with the query 'SELECT * FROM "AirbnbDataV1" WHERE city = 'Queens' AND price > 200;'. The results table shows 221 rows and 0.032 seconds execution time. The table has columns: id, geom, listing_ur, name, host_locat, host_neigh, street, neighbour, neighbou_1, and neighbou_2.

	id	geom	listing_ur	name	host_locat	host_neigh	street	neighbour	neighbou_1	neighbou_2
1	512775	0104000020E61...	https://www.air...	The Cottage / 1...	New York, New...	Astoria	Queens, NY, Un...	Astoria	Long Island City	Queens
2	726692	0104000020E61...	https://www.air...	House 10 min f...	New York, New...	Astoria	Queens, NY, Un...	Astoria	Astoria	Queens
3	765563	0104000020E61...	https://www.air...	Big Comfy Bed...	New York, New...	Bayside	Queens, NY, Un...	Bayside	Bayside	Queens
4	771436	0104000020E61...	https://www.air...	3BR/3 Bath Ho...	New York, New...	Ditmars / Stein...	Queens, NY, Un...	Ditmars / Stein...	Ditmars Steinway	Queens
5	836720	0104000020E61...	https://www.air...	Brand New Bay ...	New York, New...	College Point	Queens, NY, Un...	College Point	College Point	Queens
6	1490242	0104000020E61...	https://www.air...	Joli studio IÉ lo...	New York, New...	Long Island City	Queens, NY, Un...	Long Island City	Long Island City	Queens
7	2141549	0104000020E61...	https://www.air...	SPACIOUS BEA...	New York, New...	Astoria	Queens, NY, Un...	Astoria	Astoria	Queens
8	2268632	0104000020E61...	https://www.air...	Big Queens NY ...	New York, New...	Sunnyside	Queens, NY, Un...	Sunnyside	Sunnyside	Queens
9	2291575	0104000020E61...	https://www.air...	Super Bowl Spa...	New York, New...	Astoria	Queens, NY, Un...	Astoria	Astoria	Queens
10	2349737	0104000020E61...	https://www.air...	NYC Apt - Clos...	New York, New...	Rego Park	Queens, NY, Un...	Rego Park	Rego Park	Queens
11	2683455	0104000020E61...	https://www.air...	4BR Family apt ...	New York, New...	Sunnyside	Queens, NY, Un...	Sunnyside	Long Island City	Queens



InfoTablePreviewQuery (vchen_airbnb_postgis)

Save query

Name

1

SELECT * FROM "AirbnbDataV1" WHERE city = 'Queens' AND price > 200;

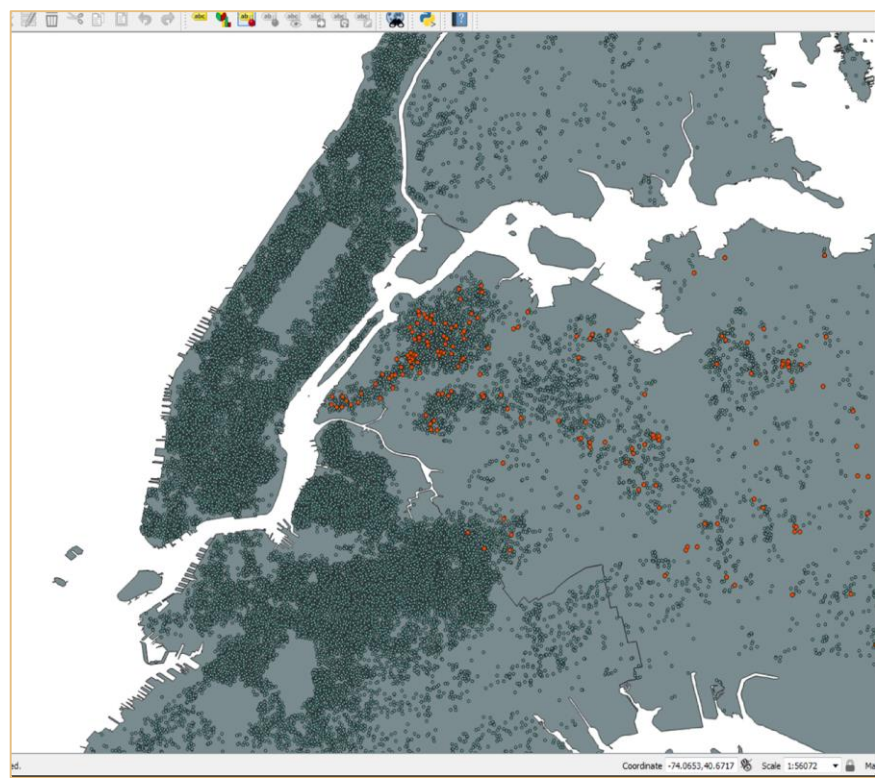
Execute

221 rows, 0.032 seconds

Create a view

Clear

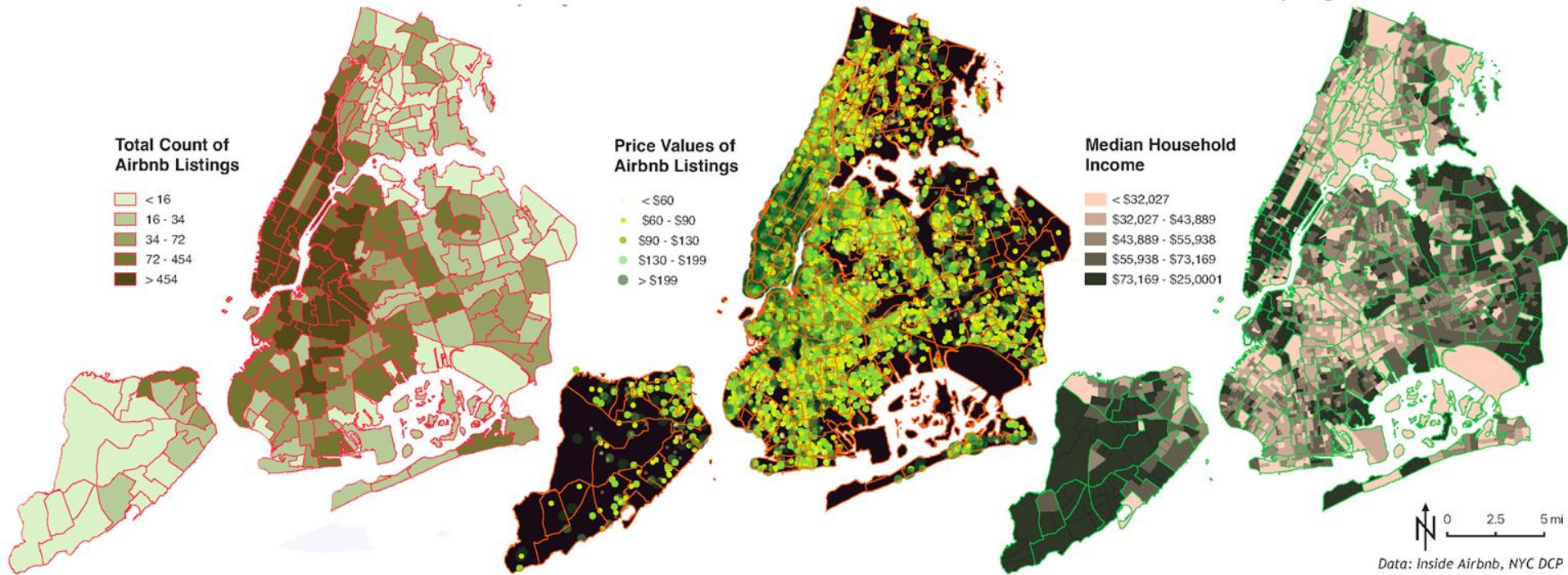
	id	geom	listing_ur	name	host_locat	host_neigh	street	neighbourh	neighbou_1	neighbou_2
1	512775	0104000020E61...	https://www.air...	The Cottage / 1...	New York, New...	Astoria	Queens, NY, Un...	Astoria	Long Island City	Queens
2	726692	0104000020E61...	https://www.air...	House 10 min f...	New York, New...	Astoria	Queens, NY, Un...	Astoria	Astoria	Queens
3	765563	0104000020E61...	https://www.air...	Big Comfy Bed...	New York, New...	Bayside	Queens, NY, Un...	Bayside	Bayside	Queens
4	771436	0104000020E61...	https://www.air...	3BR/3 Bath Ho...	New York, New...	Ditmars / Stein...	Queens, NY, Un...	Ditmars / Stein...	Ditmars Steinway	Queens
5	836720	0104000020E61...	https://www.air...	Brand New Bay ...	New York, New...	College Point	Queens, NY, Un...	College Point	College Point	Queens
6	1490242	0104000020E61...	https://www.air...	Joli studio ÎE lo...	New York, New...	Long Island City	Queens, NY, Un...	Long Island City	Long Island City	Queens
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10	2349737	0104000020E61...	https://www.air...	NYC Apt - Clos...	New York, New...	Rego Park	Queens, NY, Un...	Rego Park	Rego Park	Queens
11	2683455	0104000020E61...	https://www.air...	4BR Family apt ...	New York, New...	Sunnyside	Queens, NY, Un...	Sunnyside	Long Island City	Queens



Assignment 2: QGIS Customizations

Airbnb Distribution in NYC

by Neighborhood Tabulation Area



Pros:

- Easy to customize
- Can handle different file formats
- Mac-friendly

Cons:

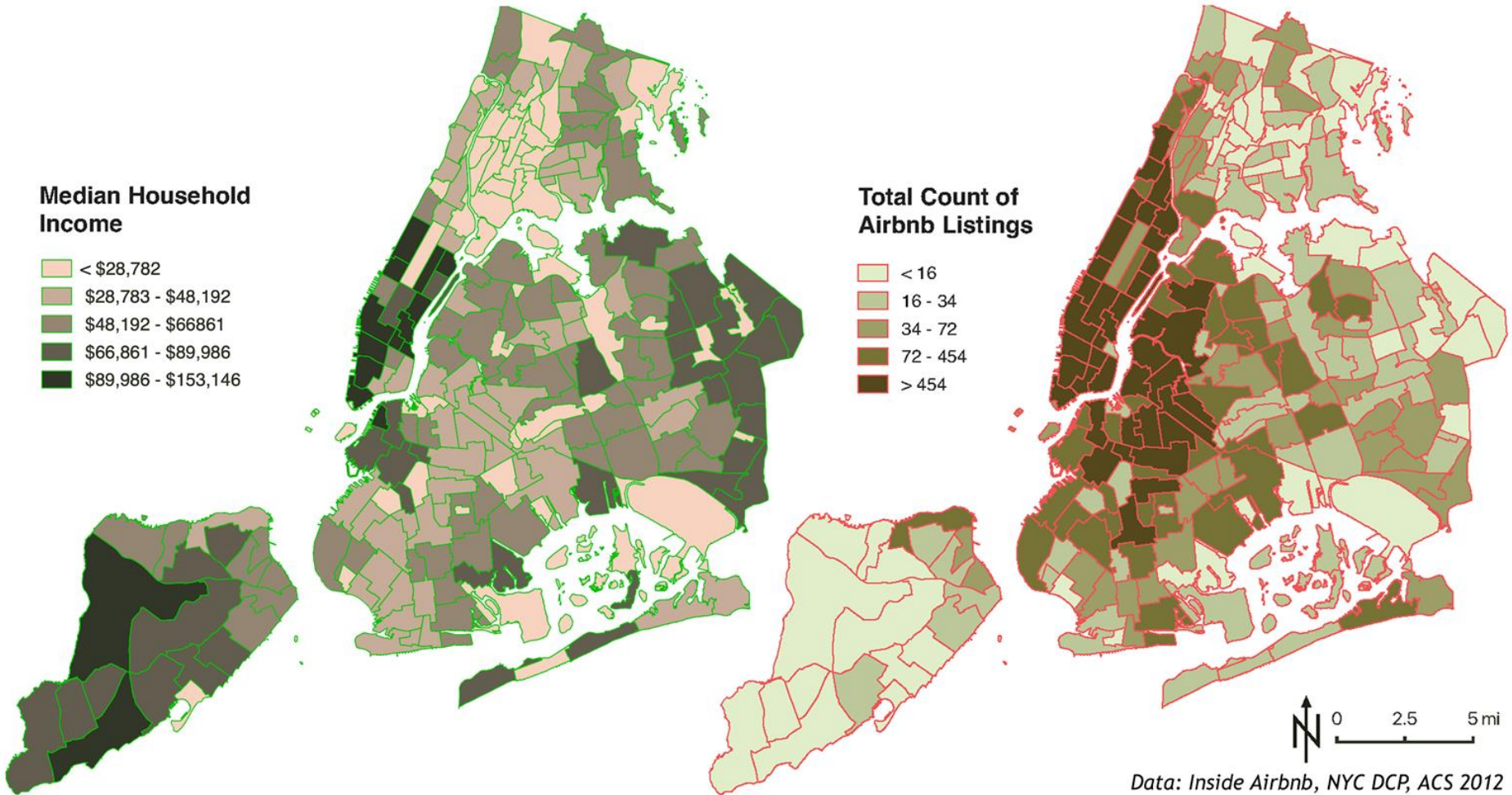
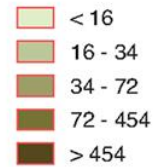
- Like ArcMap, had to do workarounds when customizing
- Speed


```
SELECT ntacode, AVG(MHI)
FROM MHINTA
GROUP BY ntacode;
```

Median Household Income

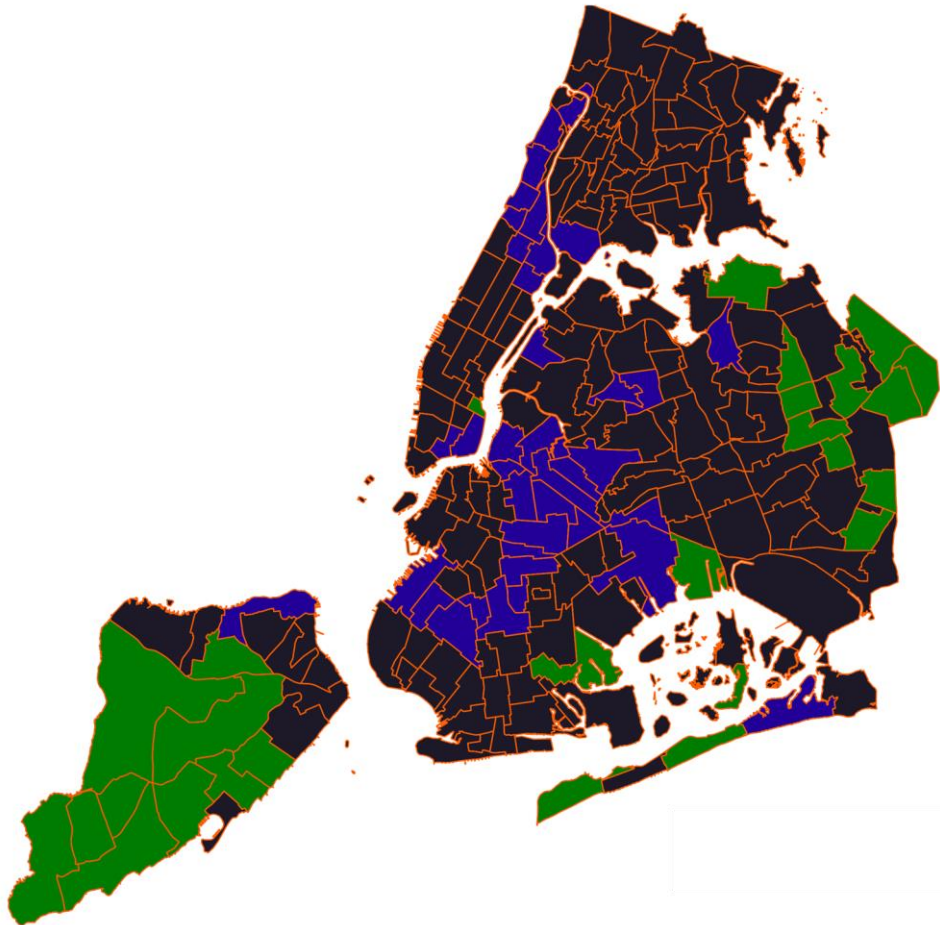
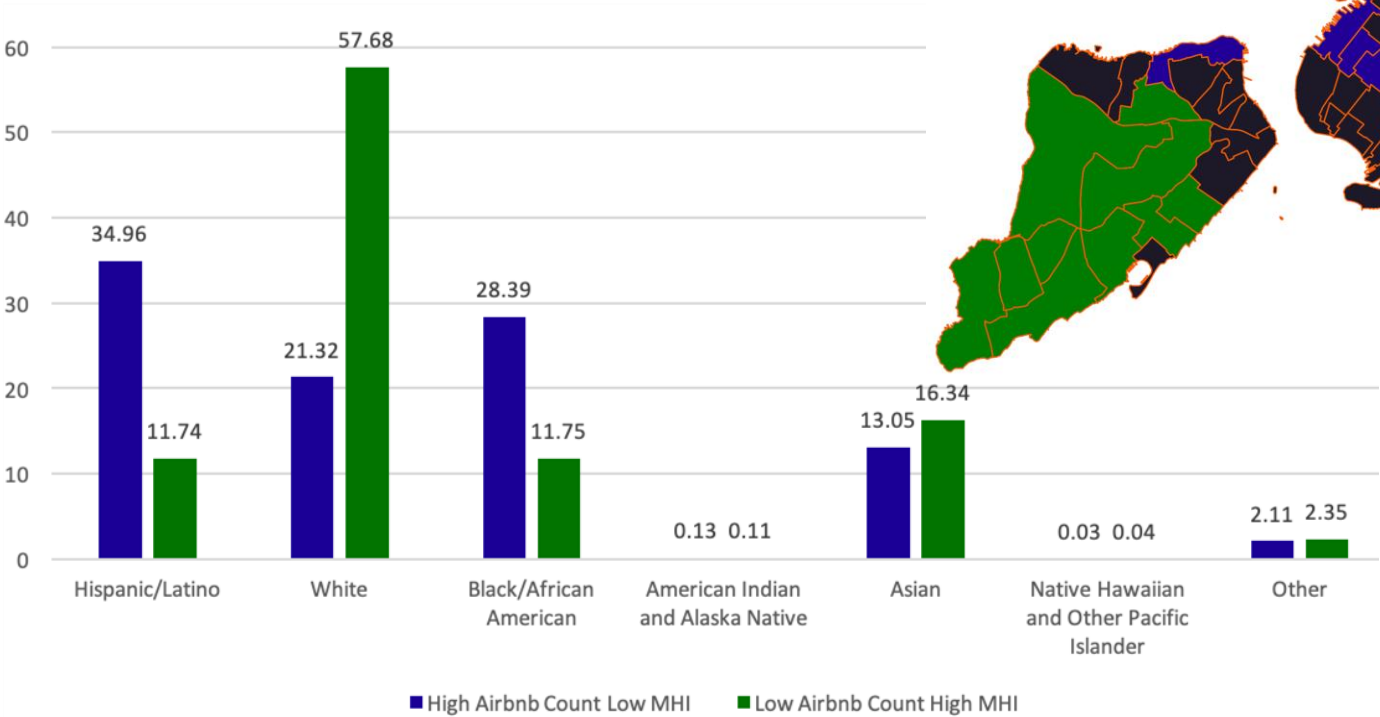


Total Count of Airbnb Listings



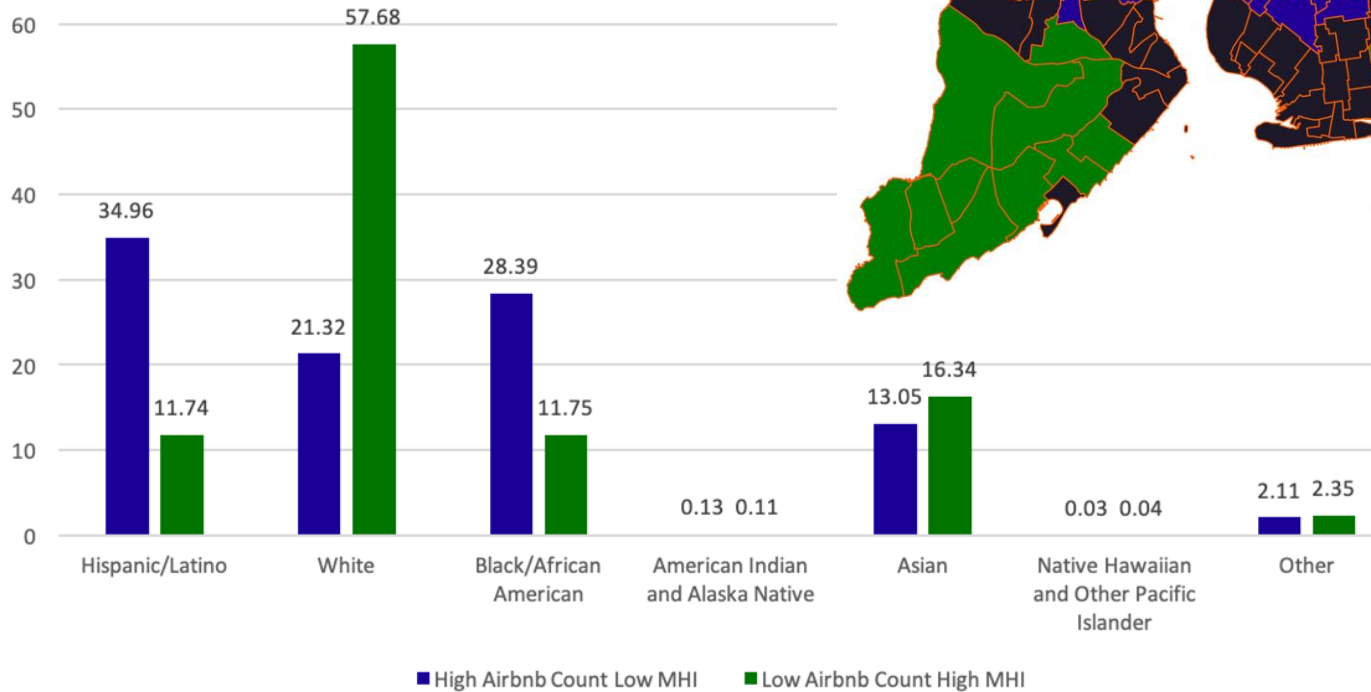
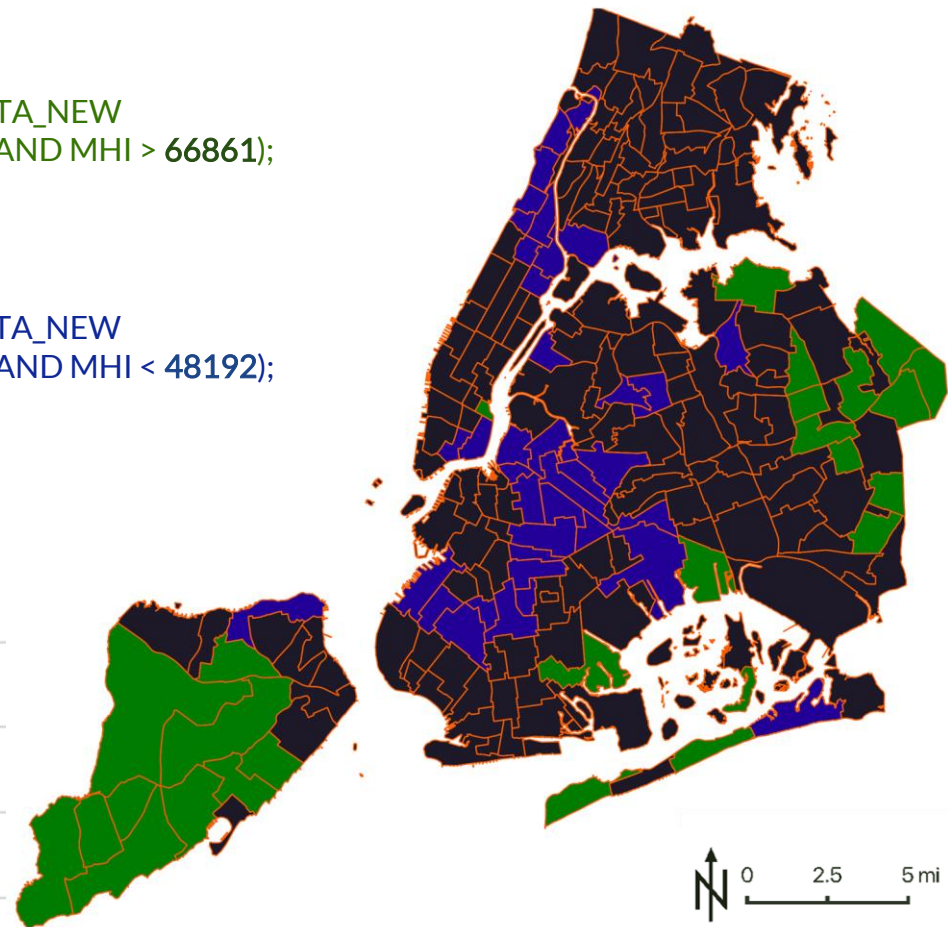
Low Airbnb Count, High MHI
SELECT *
FROM CountAirbnb_MHI_NTA_NEW
WHERE (NUMPOINTS < 34 AND MHI > 66861);

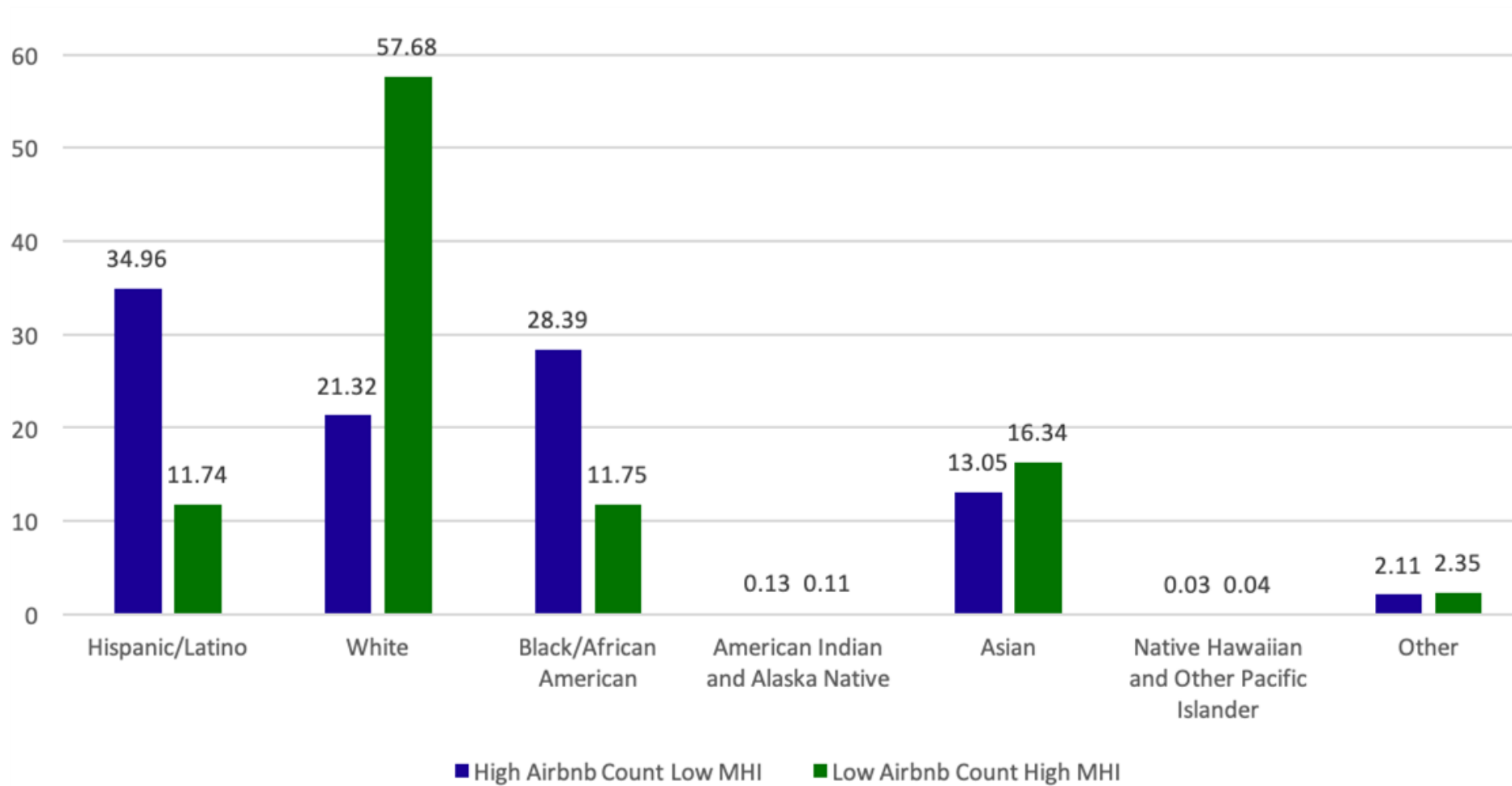
High Airbnb Count, Low MHI
SELECT *
FROM CountAirbnb_MHI_NTA_NEW
WHERE (NUMPOINTS > 72 AND MHI < 48192);



Low Airbnb Count, High MHI
 SELECT*
 FROM CountAirbnb_MHI_NTA_NEW
 WHERE (NUMPOINTS < 34 AND MHI > 66861);

High Airbnb Count, Low MHI
 SELECT*
 FROM CountAirbnb_MHI_NTA_NEW
 WHERE (NUMPOINTS > 72 AND MHI < 48192);





Assignment 3: GeoServer, GeoWebServices

Style Editor - point

Edit the current style. The editor can provide syntax highlighting and automatic formatting. Click on the "validate" button to verify the style is a

Data **Publishing** **Layer Preview** **Layer Attributes**

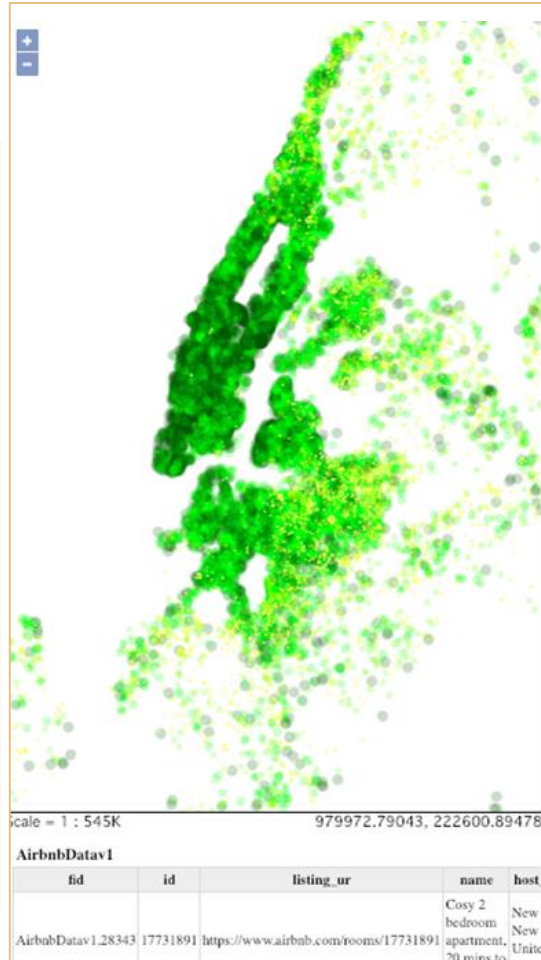
Style Data
Name: point
Workspace:
Format:
Format only editable for new styles

Style Content
Generate a default style
Choose C... Generate ...
Copy from existing style
Choose One Copy ...
Upload a style file
Choose File No file chosen Upload ...

Legend
Legend
Add legend
Preview legend
Less than \$60
\$60 to \$90
\$90 to \$130
\$130 to \$200
Greater than \$200

Font 12pt Height 400px

```
<?xml version="1.0" encoding="UTF-8"?>
<Rule>
  <Name>price1</Name>
  <Title>Less than $60</Title>
  <ogc:Filter>
    <ogc:PropertyIsLessThan>
      <ogc:PropertyName>price</ogc:PropertyName>
      <ogc:Literal>60</ogc:Literal>
    </ogc:PropertyIsLessThan>
  </ogc:Filter>
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      </Fill>
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    </Graphic>
  </PointSymbolizer>
</Rule>
<Rule>
  <Name>price2</Name>
  <Title>$60 to $90</Title>
  <ogc:Filter>
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<Rule>
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        <ogc:Literal>130</ogc:Literal>
      </ogc:PropertyIsGreaterThanOrEqualTo>
      <ogc:PropertyIsLessThan>
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```



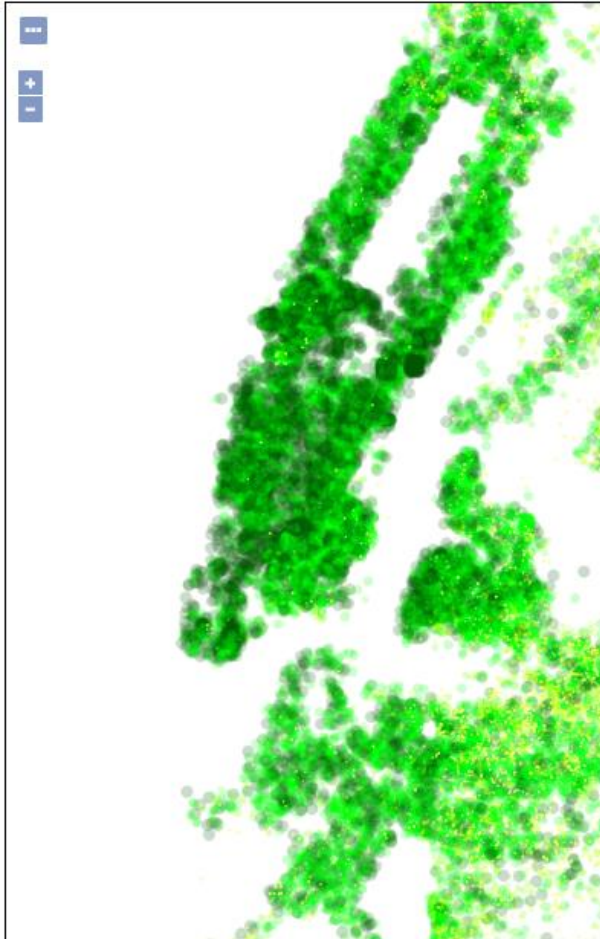
Pros:

- Cool customizations with HTML
- Had to keep looking up code

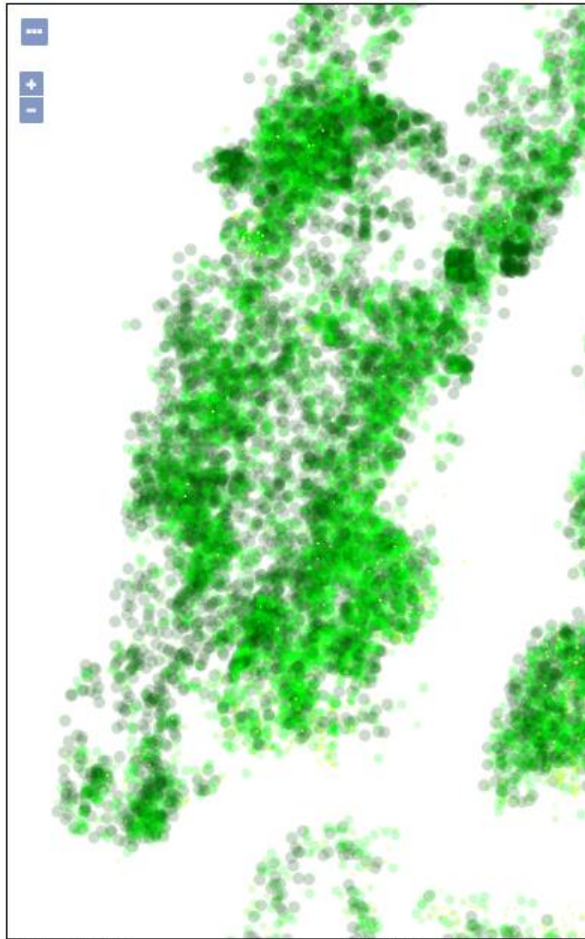
Cons:

- Was difficult connecting to GeoServer via Mac
- No live updating when customizing

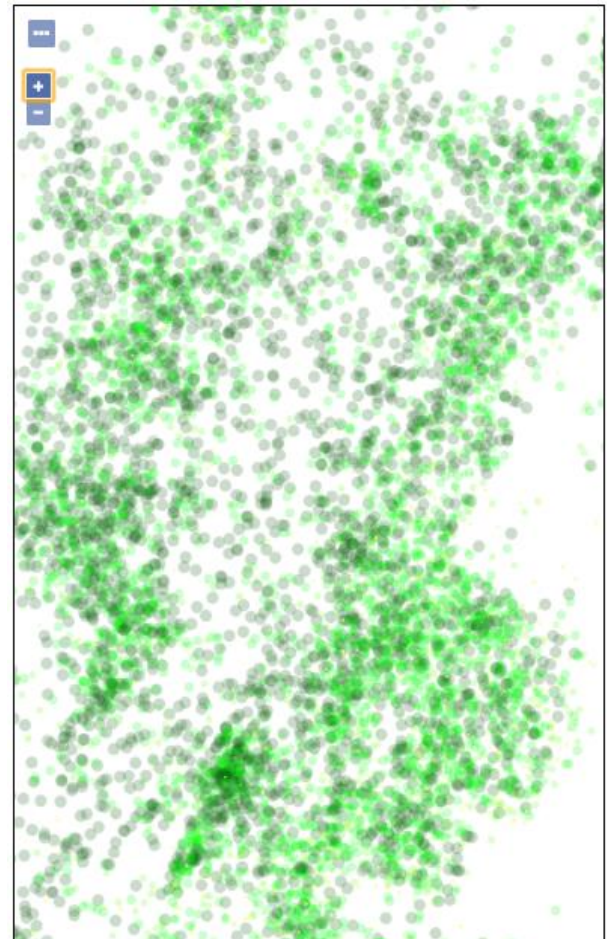
Assignment 3: GeoServer, GeoWebServices (cont.)



Scale = 1 : 273K
996349.28403, 210271.02861
Click on the map to get feature info

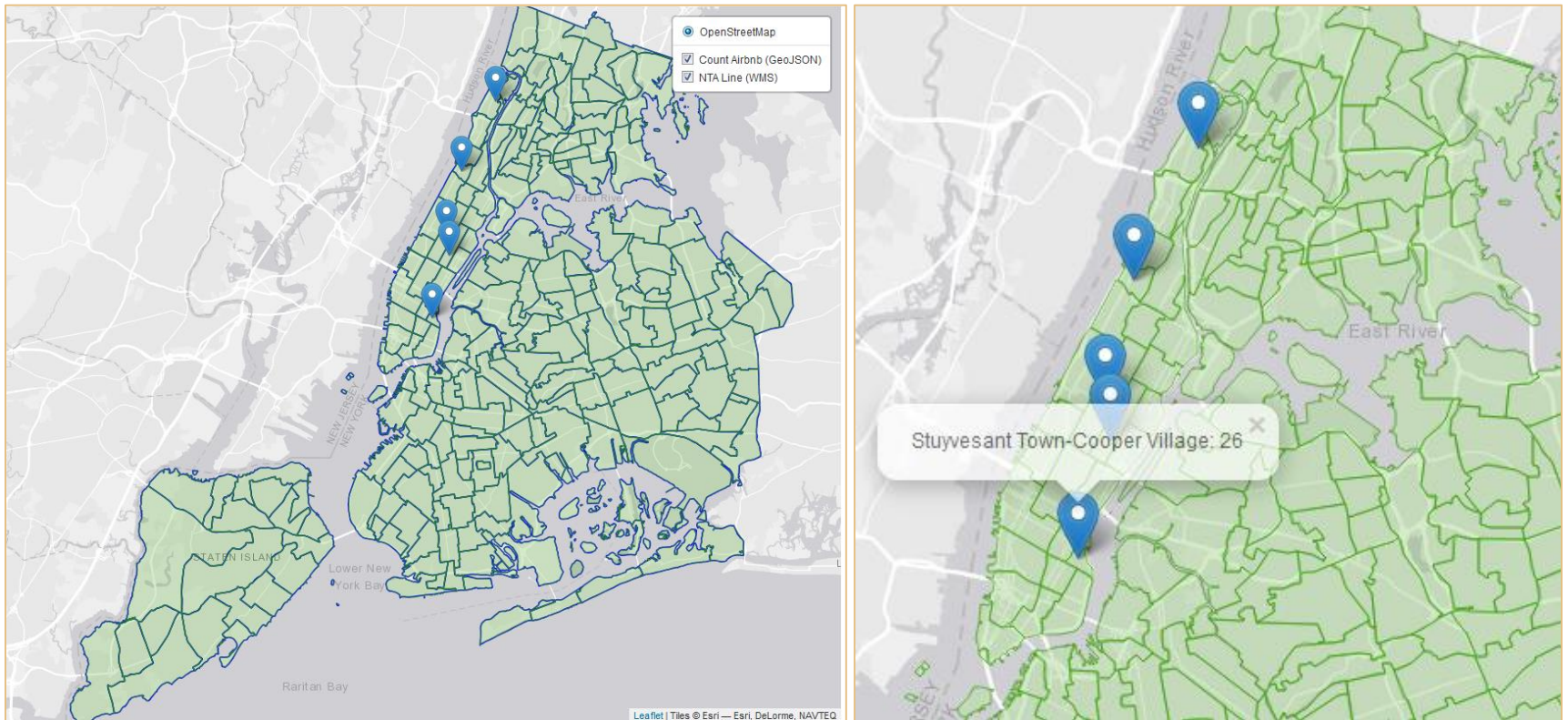


Scale = 1 : 136K
985793.24718, 209622.48857
Click on the map to get feature info



Scale = 1 : 68K
982443.10314, 213554.81250
Click on the map to get feature info

Assignment 4: Leaflet, WebGIS



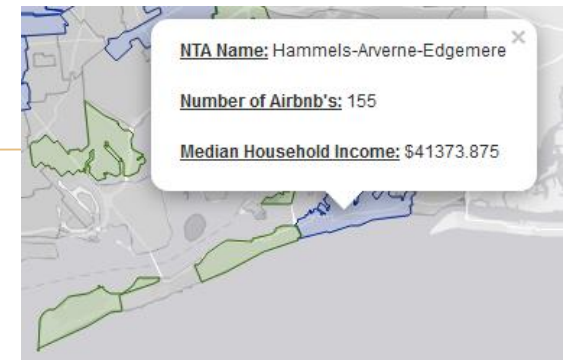
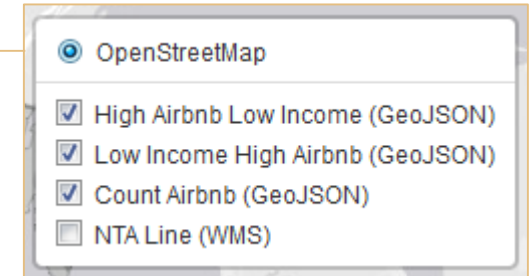
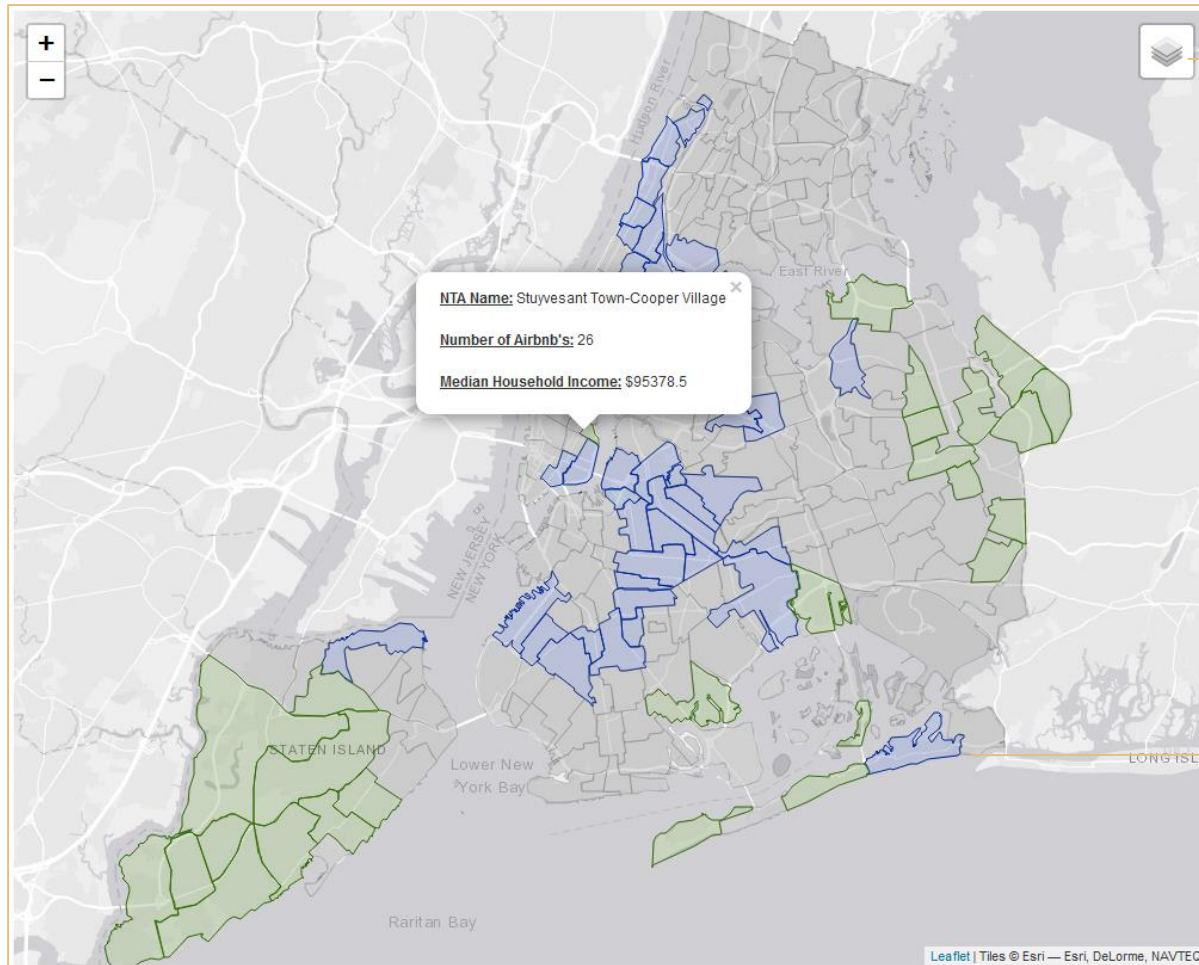
Pros:

- Variety of features
- Interactive

Cons:

- More time to customize (JavaScript)

Assignment 4: Leaflet, WebGIS (cont.)



Airbnb Distribution in NYC

by Neighborhood Tabulation Area

