

# **Coursera Capstone project**

# Introduction

## Introduction

I am currently living and working in Singapore, within walking distance to the Town Center with great venues and attractions and restaurants, such as international cuisine, entertainment and shopping and kindergarten for my family. I am currently considering a job offer that will allow me to move to New York and I would like to explore if I can find a place to live similar to the one I live now.

## Problem to be resolved:

How to find an apartment in Manhattan with the following conditions:

- Apartment with min 2 bedrooms
- Monthly rent not to exceed US\$7000/month
- Located within walking distance ( $\leq 1.0$  mile, 1.6 km) from a subway metro station in Manhattan
- Venues and amenities as in my current residence

# Data Section

## Data Requirements

- Geodata for current residence in Singapore with venues established using Foursquare.
- List of Manhattan (MH) neighborhoods with clustered venues established via Foursquare (as in Course Lab).
- [https://en.wikipedia.org/wiki/List\\_of\\_Manhattan\\_neighborhoods#Midtown\\_neighborhoods](https://en.wikipedia.org/wiki/List_of_Manhattan_neighborhoods#Midtown_neighborhoods) -List of subway metro stations in Manhattan with addresses and geo data (lat,long): [https://en.wikipedia.org/wiki/List\\_of\\_New\\_York\\_City\\_Subway\\_stations\\_in\\_Manhattan](https://en.wikipedia.org/wiki/List_of_New_York_City_Subway_stations_in_Manhattan) , (<https://www.google.com/maps/search/manhattan+subway+metro+stations/@40.7837297,-74.1033043,11z/data=!3m1!4> - List of apartments for rent in Manhattan area with information on neighborhood location, address, number of beds, area size, monthly rent price and complemented with geo data via Nominatim. <http://www.rentmanhattan.com/index.cfm?page=search&state=results> <https://www.nestpick.com/search?city=new-york> -Place to work in Manhattan (Park Avenue and 53rd St) for reference.

## Data Sources, Data Processing and Tools used

- Singapore data and map is to be created with the use of Nominatim , Foursquare and Folium mapping
- Manhattan neighborhoods were obtained from Wikipedia and organized by Neighborhoods with geodata via Nominatim for mapping with Folium.
- List of Subway stations was obtained via Wikipedia, NY Transit website and Google map,
- List of apartments for rent was consolidated from web-scraping real estate sites for MH. The geolocation (lat,long) data was found with algorithm coding and using Nominatim.
- Folium map was the basis of

mapping with various features to consolidate all data in ONE map where one can visualize all details needed to make a selection of apartments.

## Methodology

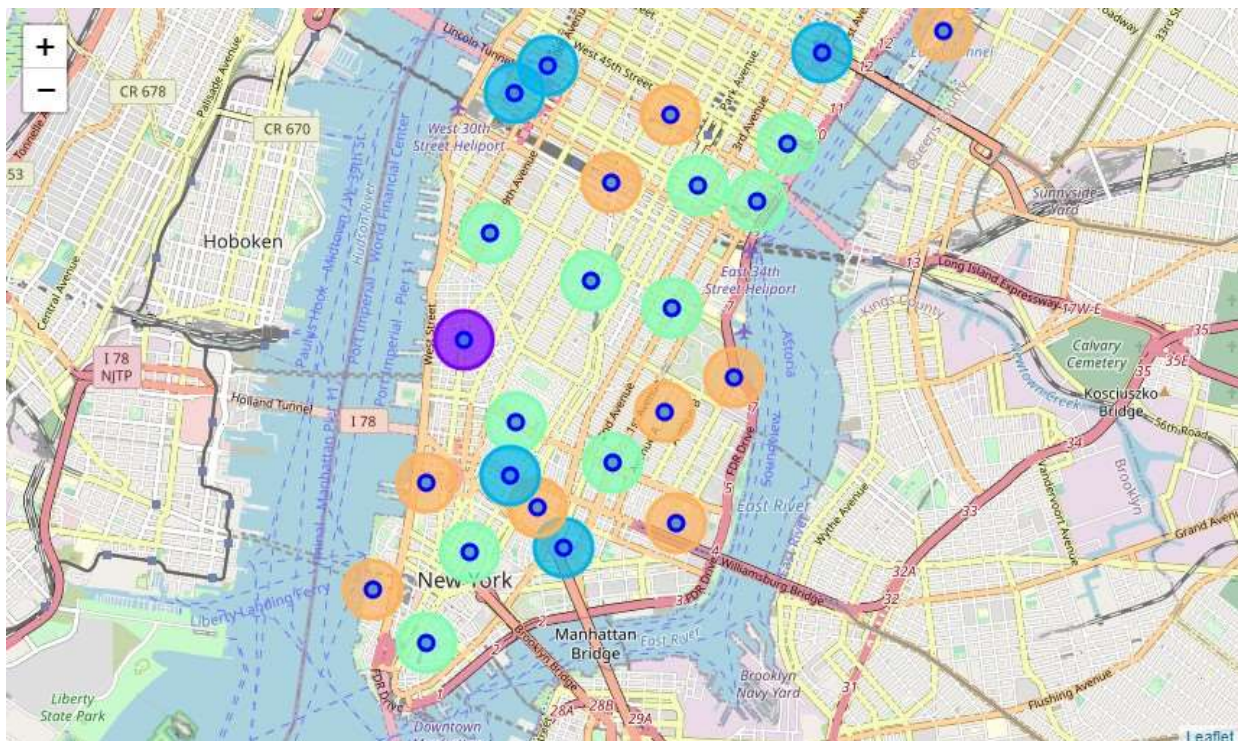
The strategy is based on mapping the described data in section 2.0, in order to facilitate the choice of at least two candidate places for rent. The information will be consolidated in ONE MAP where one can see the details of the apartment, the cluster of venues in the neighborhood and the relative location from a subway station and from work place. A measurement tool icon will also be provided. The pop ups on the map items will display rent price, location and cluster of venues applicable. The Tools: Web-scraping of sites is used to consolidate data-frame information which was saved as csv files for convenience and to simplify the report. Geodata was obtained by coding a program to use Nominatim to get latitude and longitude of subway stations and also for each of (144 units) the apartments for rent listed. Geopy\_distance and Nominatim were used to establish relative distances. Seaborn graphic was used for general statistics on rental data. Maps with pop ups labels allow quick identification of location, price and feature, thus making the selection very easy.

## Execution and Results

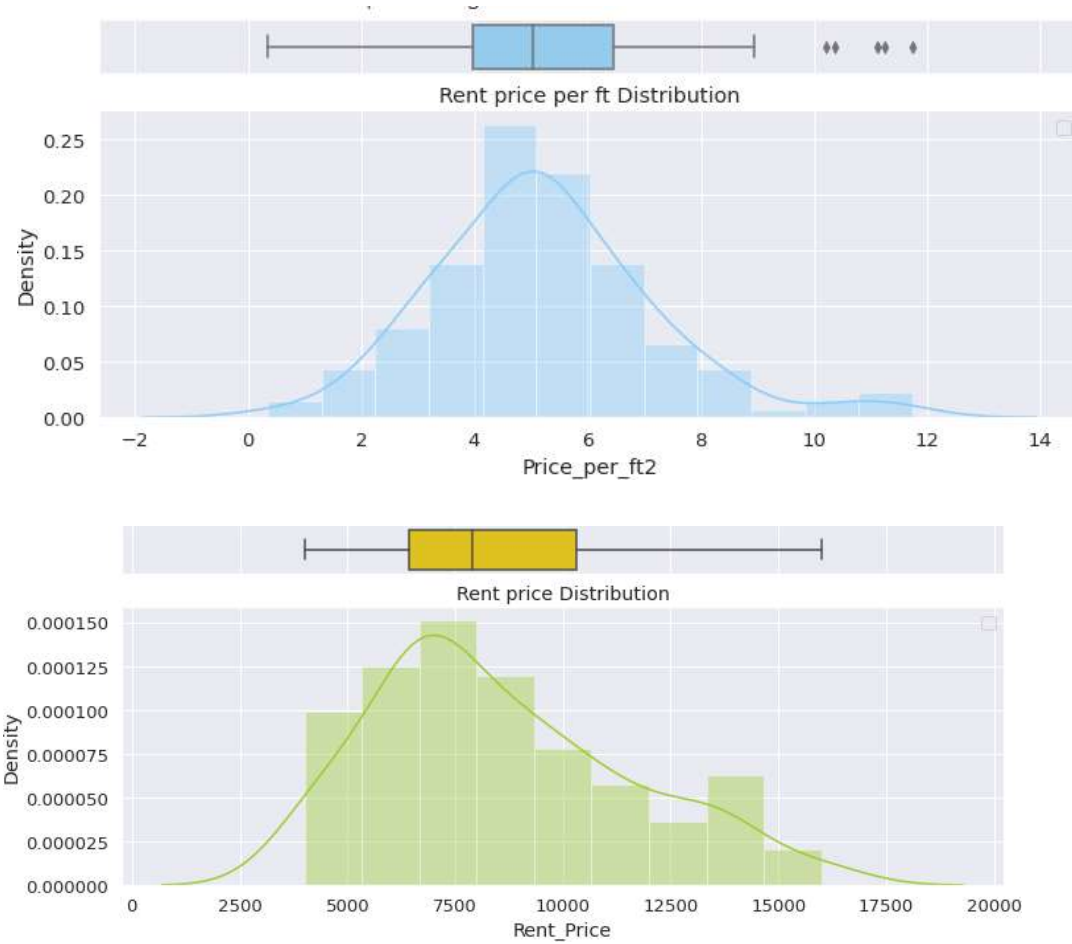
Current residence Neighborhood in Singapore



Manhattan Map - Neighborhoods and Cluster of Venues

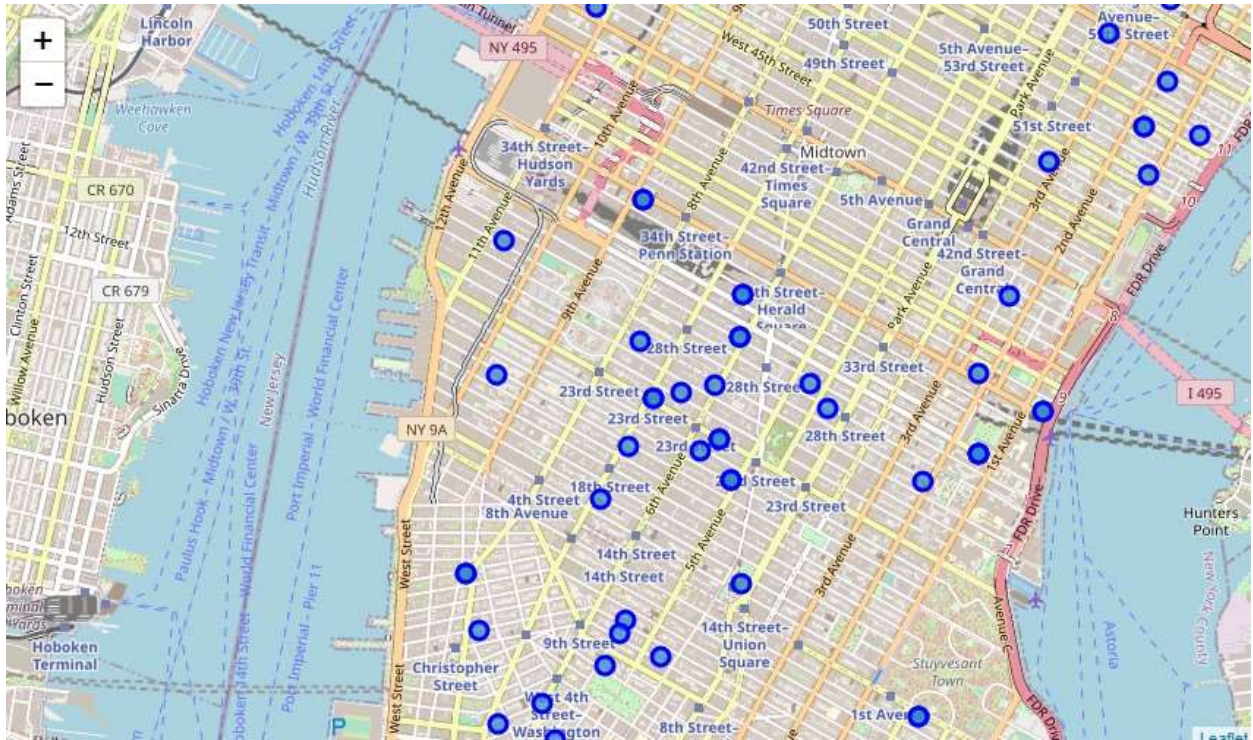


## Rental Price Statistics MH Apartments

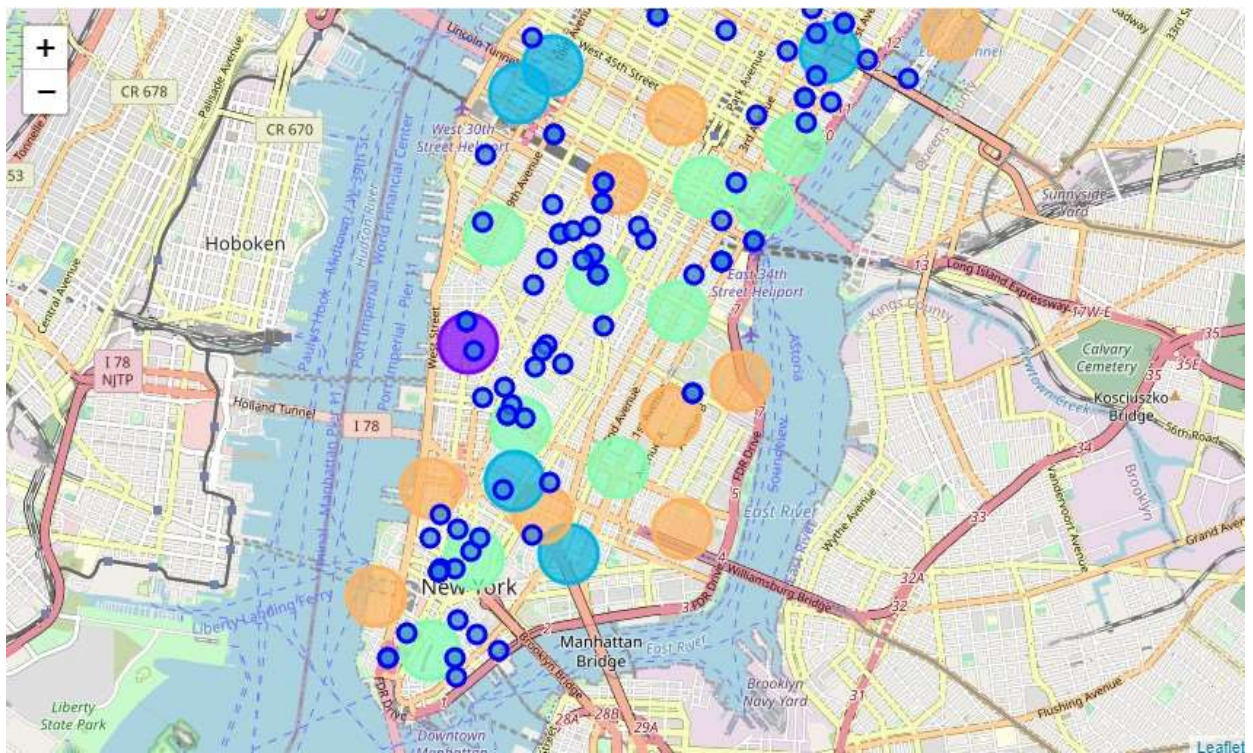


## Apartments for Rent in MH



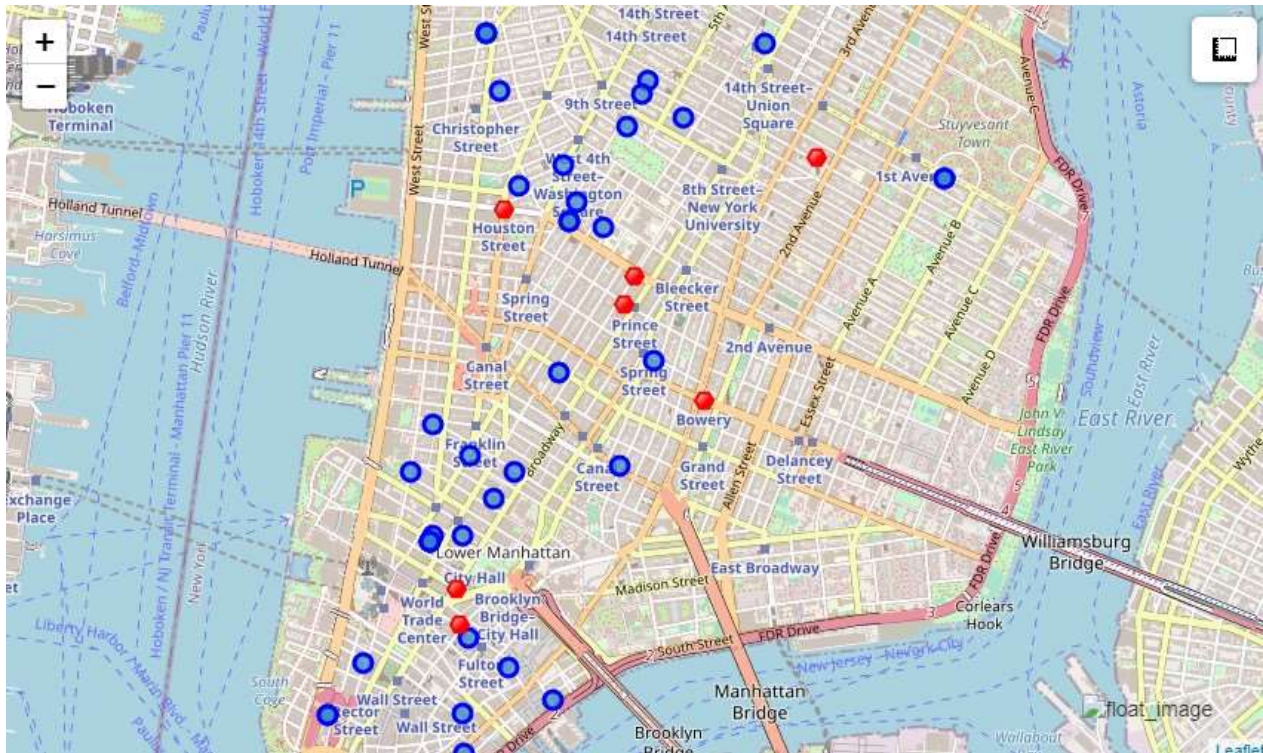


MH apts for rent with venue clusters





Apts for rent (blue) and subway stations (red)



## Final Result: Apartment Selection

Using the "one map" above, I was able to explore all possibilities since the pop ups provide the information needed for a good decision. Apartment 1 rent cost is US\$7500 slightly above the US\$7000 budget. Apt 1 is located 400 meters from the subway station at 59th Street and the workplace ( Park Ave and 53rd) is another 600 meters away. I can walk to work place and use subway for other places around. Venues for this apt are as of Cluster 2 and it is located in a fine district in the East side of Manhattan. Apartment 2 rent cost is US\$6935, just under the US\$7000 budget. Apt 2 is located 60 meters from subway station at Fulton Street, but I will have to ride the subway daily to work , possibly 40-60 min ride. Venues for this apt are as of Cluster 3. Based on current Singapore venues, I feel that Cluster 2 type of venues is a closer resemblance to my current place. That means that APARTMENT 1 is a better choice since the extra monthly rent is worth the conveniences it provides.