


A low-angle, upward-looking photograph of several modern skyscrapers against a dramatic sky at sunset or sunrise. The buildings are covered in glass and steel, reflecting the warm orange and pink light of the low sun. The perspective creates a sense of height and scale, with the buildings converging towards the top of the frame. The sky is filled with soft, wispy clouds, and the overall color palette is dominated by the warm tones of the sunset and the cool blues and greys of the buildings.

Where2Live-CE College Edition

*LET THE DATA HELP YOU CHOOSE
THE NEIGHBORHOOD*



Second to choosing a college or university, where to live “off campus” can be the most stressful decision students and parents must make.



My proposed business challenge is to provide a solution to aid parents and students in making that decision using a data-driven process.

Where2Live-CE The Proposal

- ▶ To aid residential decision-making, Where2Live will provide critical safety information by:
 - ▶ Plotting university residential neighborhoods on a map
 - ▶ Deriving neighborhood crime statistics
 - ▶ Visually displaying density of crimes with choropleth maps
- ▶ Where2Live will additionally survey neighborhood venues and services using FourSquare to tip the scales to what our students most desire in the surrounding area – such as: bars, coffee shops, bakeries/grocery stores, parks, and gyms.
- ▶ Where2Live-CE would aim to cover universities in major cities where data is readily available, starting with Columbia University, NYC.

Columbia University

New York City, New York

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Where to Live in New York

POSTED BY **GREGORY JOY**

When it comes to making the big move to the Big Apple, finding a place to live can be confusing for an incoming student. Online searching can easily bring you great prices on places but you may also be an hour away from class. Or there may be somewhere close to school but the space is limited and it's far away from the vibrant downtown life you may be looking for. Here is a guide on where to live in New York as an incoming SIPA Student and finding the neighborhood that is perfect for YOU!

Morningside Heights

Morningside Heights is the neighborhood in which Columbia University resides in. It spans from west of Morningside Park to Riverside Drive and from 110th to 125th. Some of the landmarks in Morningside Heights include Morningside Park, Cathedral Church of St. John the Divine, Mt. Sinai Hospital, and Riverside Church.

Pros: This neighborhood is great for anyone who is trying to live close to school. With everything from grocery stores to bars to classes being within a 15 minute walking distance, you're close to the academic action, school happy hours, and classmate study sessions.

Cons: You may feel that you're trapped within the Columbia bubble when living so close to school. Downtown can easily take 40-50 minutes to get to. It's also quite an expensive area. You won't get much size for your buck in this neighborhood, the grocery stores can be fairly expensive and an average meal at a local restaurant will cost you upward of \$15.

Office Working Remotely

Please note, due to COVID-19, the SIPA Admissions and Financial Aid office are working remotely starting March 16, 2020, until further notice.

We will continue to respond to emails as promptly as possible. We apologize for any inconvenience.

Important Dates

September 7, 2020: U.S. Labor Day (University Holiday)

September 8, 2020: Columbia Classes Begin

October 15, 2020: MIA/MPA/MPA-DP Spring Application Deadline

November 1, 2020: MIA/MPA/MPA-DP Fall Application Early Action Deadline

November 3, 2020: U.S. Election Day

Recent Posts



School of International and Public Affairs (SIPA) publishes a blog with a guide for incoming students on where to live. This was used for neighborhood selection.

Blog link: <http://admissionsblog.sipa.columbia.edu/2019/06/26/where-to-live-in-new-york/#:~:text=Morningside%20Heights%20Morningside%20Heights%20is%20the%20neighborhood%20in,the%20Divine%2C%20Mt.%20Sinai%20Hospital%2C%20and%20Riverside%20Church.>



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Harlem

Harlem, while contested where it actually begins and ends, is generally considered the large neighborhood east of Morningside Park. Its major landmarks include the Apollo Theater, Sylvia's Soul Food, El Museo Del Barrio, and the Schomburg Center for Research in Black Culture.

Pros: The neighborhood has a wide range to accommodate wallets of every size.

Cons: The only way to get to Columbia from Harlem is to ride the bus or to walk up the hundred stairs of Morningside Heights

Hamilton Heights/Manhattanville

I'm bringing these two neighborhoods together into the same synopsis because they offer very similar vibes and blend together. Manhattanville and Hamilton Heights are the neighborhoods between 125th Street and 155th Street, bordering Harlem to the East and Riverside to the West.

Pros: Hamilton Heights and Manhattanville are within spitting distance of Columbia University. Just take a few stops down the 1 track and you're at the campus. run around \$3000-\$3300/month with many rent-stabilized options available.

Cons: The neighborhood is very lively on the streets which can lead to a lot of noise. Compared to its surrounding neighborhoods. Some may find it boring.

Neighborhood Overview Data

More details available
on the [SIPA blog](#)

Upper West Side

Upper West Side is the Neighborhood between 59th and 110th and west of Central Park.

Pros: This neighborhood is known for its excellent food scene, proximity to Central Park, and nighttime quietness.

Cons: Upper West side brings a new definition of expensive, especially if you're living below 100th street.

Midtown

Midtown is truly the heart of New York, with neighborhoods like Times Square, Hell's Kitchen, and Turtle Bay. Midtown is the entire area of Manhattan between 34th and 59th street.

Pros: In Midtown, there is quite literally everything to do. It's a vibrant part of the city with endless options of fun.

Cons: The area is tourist central so expect it to be incredibly packed and people stopping every few feet to take pictures.

Data Sources

Where2Live-College Edition



New York City data containing the neighborhoods and boroughs, latitudes, and longitudes for mapping locations are obtained from the data source:

- https://cocl.us/new_york_dataset

```
] #View dataframe to confirm reduced neighborhoods
NY_df
```

```
Out[193]:
```

	Borough	Neighborhood	Latitude	Longitude
4	Manhattan	Hamilton Heights	40.823604	-73.949688
5	Manhattan	Manhattanville	40.816934	-73.957385
6	Manhattan	Central Harlem	40.815976	-73.943211
7	Manhattan	East Harlem	40.792249	-73.944182
12	Manhattan	Upper West Side	40.787658	-73.977059
15	Manhattan	Midtown	40.754691	-73.981669
26	Manhattan	Morningside Heights	40.808000	-73.963896

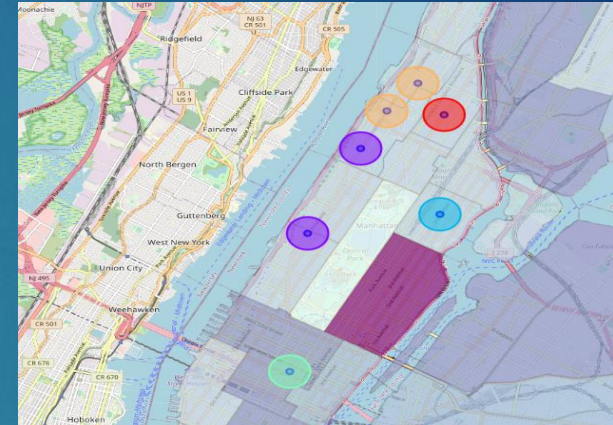
NYC Crime data to assess safety will be obtained from the following data set:

- <https://data.cityofnewyork.us/Public-Safety/NYPD-Complaint-Data-Current-Year-To-Date-/5uac-w243>

	Precinct Number	Borough	Occurrence Year	MCI	Lat	Long	Coordinates
0	5	MANHATTAN	2019	SEX CRIMES	40.716196	-73.997491	(40.716195914000025, -73.99749074599998)
1	23	MANHATTAN	2019	OFF. AGNST PUB ORD SENSBLTY &	40.799665	-73.947200	(40.799665264000055, -73.94719977999995)
2	5	MANHATTAN	2019	RAPE	40.716196	-73.997491	(40.716195914000025, -73.99749074599998)
3	5	MANHATTAN	2019	PETIT LARCENY	40.714431	-74.006101	(40.714430898000046, -74.00610127799997)
4	9	MANHATTAN	2019	DANGEROUS DRUGS	40.722397	-73.978536	(40.72239709900003, -73.97853584199999)
5	18	MANHATTAN	2019	THEFT-FRAUD	40.770827	-73.992611	(40.770827222000044, -73.99261118899994)
6	14	MANHATTAN	2019	GRAND LARCENY	40.747881	-73.991040	(40.74788104700008, -73.99104019099997)
7	19	MANHATTAN	2019	GRAND LARCENY	40.775773	-73.954750	(40.77577282900006, -73.95475034499998)
8	30	MANHATTAN	2019	PETIT LARCENY	40.824602	-73.950114	(40.82460236600008, -73.95011391699995)
9	19	MANHATTAN	2019	OFF. AGNST PUB ORD SENSBLTY &	40.767336	-73.954875	(40.76733554700007, -73.95487521099994)
10	34	MANHATTAN	2019	PETIT LARCENY	40.853725	-73.926802	(40.85372503000008, -73.926801992)
11	19	MANHATTAN	2019	THEFT-FRAUD	40.781199	-73.947778	(40.78119897000005, -73.9477771499997)

Police Precincts for creating Choropleth reported in geojson in the following file:

- https://raw.githubusercontent.com/dwillis/nyc-maps/master/police_precincts.geojson



Foursquare Developers Access to venue data for surveying services:

- <https://foursquare.com/>

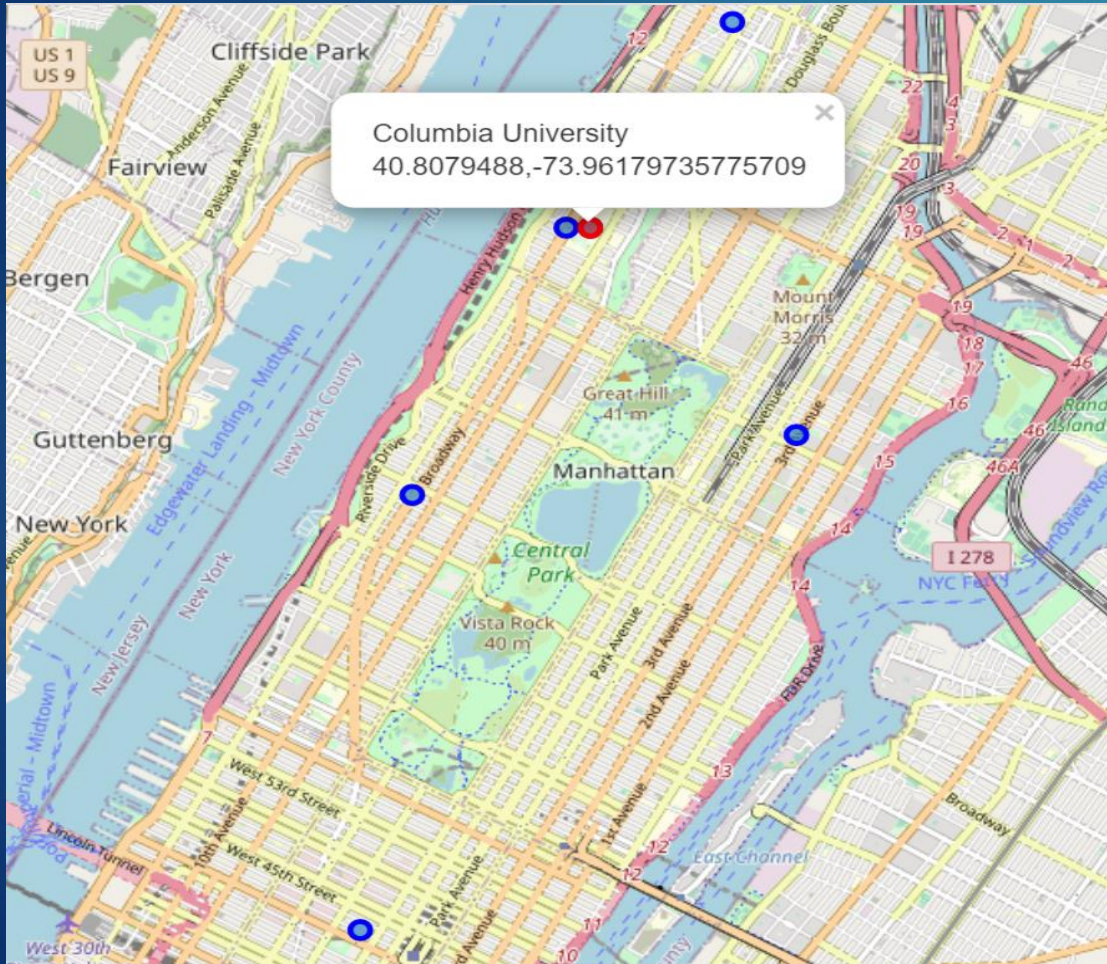
	Location	African Restaurant	American Restaurant	Arepa Restaurant	Art Gallery	Art Museum	Arts & Crafts Store
0	Central Harlem	0.04	0.03	0.00	0.01	0.01	0.02
1	East Harlem	0.01	0.01	0.00	0.00	0.02	0.00
2	Hamilton Heights	0.01	0.03	0.01	0.00	0.00	0.00
3	Manhattanville	0.00	0.04	0.00	0.01	0.00	0.01
4	Midtown	0.00	0.03	0.00	0.01	0.00	0.00
5	Morningside Heights	0.00	0.05	0.00	0.00	0.00	0.00
6	Upper West Side	0.00	0.03	0.00	0.00	0.00	0.01

How Students/Parents are Provided Insight

- ▶ Identify and map locations of university recommended residential neighborhoods
- ▶ Assess crime levels for each of the neighborhoods for relative comparisons
- ▶ Map assessed crime levels using choropleth maps, which visualized the comparison
- ▶ Survey venues and services for each of the neighborhoods using FourSquare data.
- ▶ Sort data to present the most common venues and the top 10 venues for each neighborhood.
- ▶ Calculate the K-means, a clustering algorithm which searches clusters within data and aims to minimize data dispersion for each cluster, yielding clusters with similar patterns. By clustering the neighborhoods, we can:
 - Find the pattern of venues and services in the neighborhoods and venues
 - Identify near identically serviced neighborhoods
 - Help students/parents choose which neighborhood has the best amenities for them

Columbia University and Neighborhoods

Map, Location, and Distance



	Borough	Neighborhood	Latitude	Longitude
0	Manhattan	Marble Hill	40.876551	-73.910660
1	Manhattan	Chinatown	40.715618	-73.994279
2	Manhattan	Washington Heights	40.851903	-73.936900
3	Manhattan	Inwood	40.867684	-73.921210
4	Manhattan	Hamilton Heights	40.823604	-73.949688
5	Manhattan	Manhattanville	40.816934	-73.957385
6	Manhattan	Central Harlem	40.815976	-73.943211
7	Manhattan	East Harlem	40.792249	-73.944182
8	Manhattan	Upper East Side	40.775639	-73.960508
9	Manhattan	Yorkville	40.775930	-73.947118

Distance in km between Columbia and Hamilton Heights is:
2.0165162360278153 kms
Distance in km between Columbia and Manhattanville is:
1.0650302019280105 kms
Distance in km between Columbia and Central Harlem is:
1.8038495539117967 kms
Distance in km between Columbia and East Harlem is:
2.2911192832517915 kms
Distance in km between Columbia and Upper West Side is:
2.595422209139266 kms
Distance in km between Columbia and Midtown is:
6.147523013104539 kms
Distance in km between Columbia and Morningside Heights is:
0.17719496689619196 kms
Distance in km between Columbia and Columbia University is:
0.0 kms

Crime Data Calculations to Determine Safest Neighborhood

Precinct Number	Borough	Occurrence Year	MCI	Lat	Long	Coordinates
0	5	MANHATTAN	2019	SEX CRIMES	40.716196	-73.997491 (40.716195914000025, -73.99749074599998)
1	23	MANHATTAN	2019	OFF. AGNST PUB ORD SENSBLTY &	40.799665	-73.947200 (40.799665264000055, -73.94719977999995)
2	5	MANHATTAN	2019	RAPE	40.716196	-73.997491 (40.716195914000025, -73.99749074599998)
3	5	MANHATTAN	2019	PETIT LARCENY	40.714431	-74.006101 (40.714430898000046, -74.00610127799997)
4	9	MANHATTAN	2019	DANGEROUS DRUGS	40.722397	-73.978536 (40.722397099000003, -73.97853584199999)
5	18	MANHATTAN	2019	THEFT-FRAUD	40.770827	-73.992611 (40.770827222000044, -73.99261118899994)
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8	30	MANHATTAN	2019	PETIT LARCENY	40.824602	-73.950114 (40.824602366000008, -73.95011391699995)
9	19	MANHATTAN	2019	OFF. AGNST PUB ORD SENSBLTY &	40.767336	-73.954875 (40.767335547000007, -73.95487521099994)

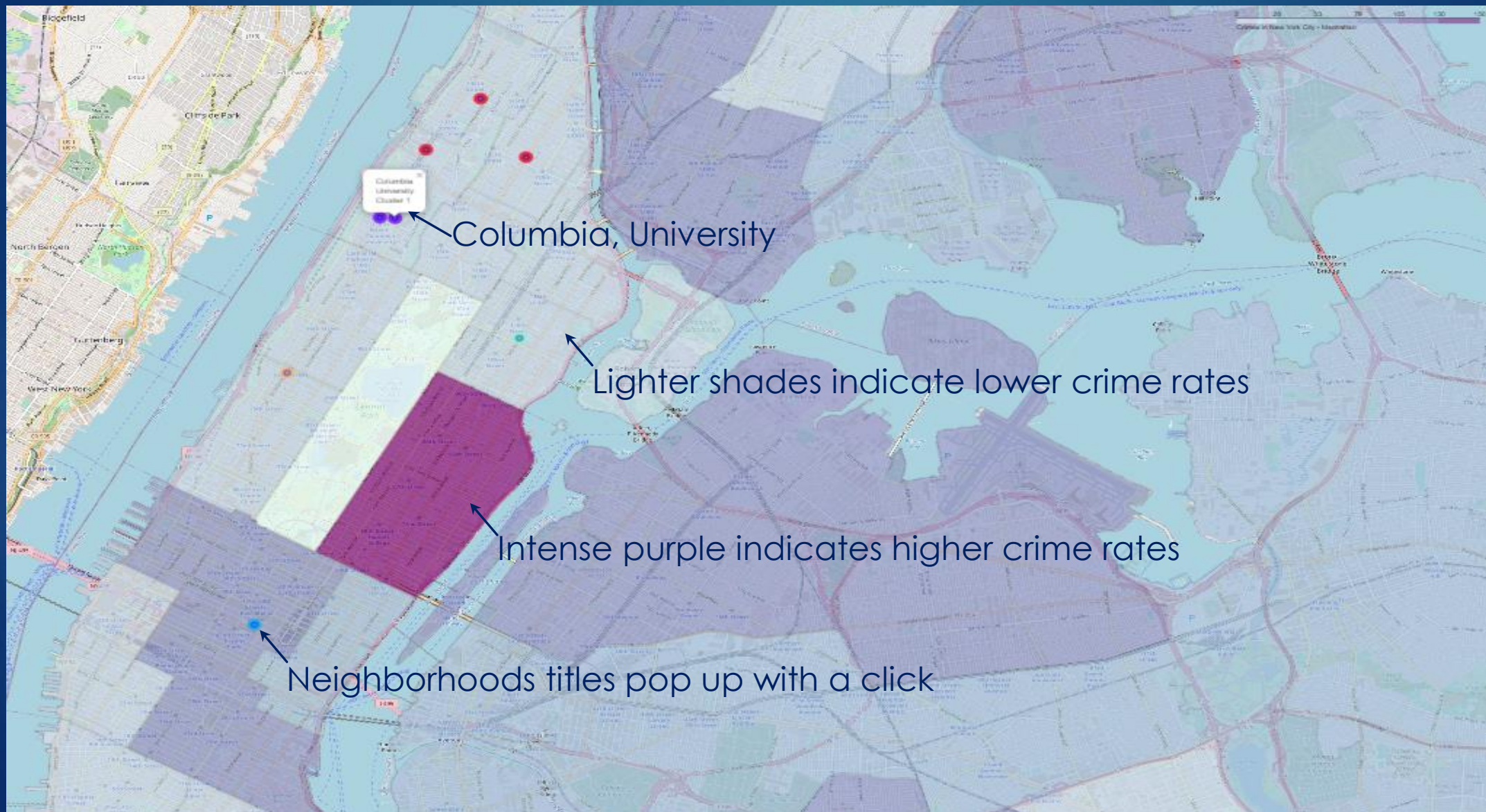
Precinct Number	Number of Incidents	
0	75	156.0
1	19	155.0
2	113	136.0
3	70	111.0
4	105	110.0
5	67	107.0
6	18	100.0
7	44	100.0
8	14	100.0
9	114	98.0

Calculated for
Choropleth Creation

Number of
Major Crime Indicators
in Manhattan in 2019

	MCI	Number of Occurrence in 2019	Percentage of Occurrence in 2019
0	PETIT LARCENY	1171.0	22.813170
1	GRAND LARCENY	1104.0	21.507890
2	HARRASSMENT 2	512.0	9.974674
3	CRIMINAL MISCHIEF & RELATED OF	466.0	9.078512
4	OFF. AGNST PUB ORD SENSBLTY &	339.0	6.604325
5	THEFT-FRAUD	280.0	5.454900
6	SEX CRIMES	190.0	3.701539
7	ASSAULT 3 & RELATED OFFENSES	153.0	2.980713
8	MISCELLANEOUS PENAL LAW	135.0	2.630041
9	RAPE	96.0	1.870251
10	BURGLARY	80.0	1.558543
11	FRAUDS	80.0	1.558543
12	UNAUTHORIZED USE OF A VEHICLE	77.0	1.500097
13	DANGEROUS DRUGS	71.0	1.383207
14	FELONY ASSAULT	65.0	1.266316
15	GRAND LARCENY OF MOTOR VEHICLE	58.0	1.129944
16	OFFENSES AGAINST PUBLIC ADMINI	45.0	0.876680
17	FORGERY	43.0	0.837717
18	NYS LAWS-UNCLASSIFIED FELONY	31.0	0.603935
19	ADMINISTRATIVE CODE	20.0	0.389636
20	ARSON	15.0	0.292227
21	ROBBERY	15.0	0.292227
22	CRIMINAL TRESPASS	13.0	0.253263
23	VEHICLE AND TRAFFIC LAWS	11.0	0.214300
24	OFFENSES AGAINST THE PERSON	9.0	0.175336
25	POSSESSION OF STOLEN PROPERTY	9.0	0.175336
26	OTHER OFFENSES RELATED TO THEF	9.0	0.175336
27	THEFT OF SERVICES	7.0	0.136372
28	DANGEROUS WEAPONS	7.0	0.136372
29	OTHER STATE LAWS (NON PENAL LA	5.0	0.097409
30	MURDER & NON-NEGL. MANSLAUGHTER	5.0	0.097409
31	ANTICIPATORY OFFENSES	3.0	0.058445
32	INTOXICATED & IMPAIRED DRIVING	3.0	0.058445
33	FRAUDULENT ACCOSTING	2.0	0.038964
34	OFFENSES INVOLVING FRAUD	2.0	0.038964
35	PROSTITUTION & RELATED OFFENSES	2.0	0.038964

100



FourSquare: Venues and Services

- ▶ 164 Unique Venue Categories generated from querying FourSquare with Neighborhood, Latitude, and Longitude for “nearby venues”
- ▶ One hot encoding was used to find mean and frequency of venues for each neighborhood, which generated a Top 5 Venues List, which provides one way of judging the personality the neighborhood.

----Central Harlem----			----Manhattanville----		
	venue	freq		venue	freq
0	Southern / Soul Food Restaurant	0.05	0	Park	0.06
1	African Restaurant	0.04	1	Italian Restaurant	0.05
2	Café	0.04	2	American Restaurant	0.04
3	Sushi Restaurant	0.03	3	Seafood Restaurant	0.04
4	Cocktail Bar	0.03	4	Mexican Restaurant	0.04
----East Harlem----			----Midtown----		
	venue	freq		venue	freq
0	Mexican Restaurant	0.07	0	Theater	0.08
1	Café	0.06	1	Plaza	0.05
2	Bakery	0.06	2	Steakhouse	0.04
3	Pizza Place	0.04	3	American Restaurant	0.04
4	Deli / Bodega	0.04	4	Coffee Shop	0.04
----Hamilton Heights----			----Morningside Heights----		
	venue	freq		venue	freq
0	Coffee Shop	0.06	0	Coffee Shop	0.07
1	Café	0.04	1	Park	0.06
2	Bar	0.04	2	American Restaurant	0.05
3	Park	0.04	3	Italian Restaurant	0.05
4	Mexican Restaurant	0.04	4	Chinese Restaurant	0.04
----Upper West Side----					
	venue	freq			
0	Italian Restaurant	0.06			
1	Coffee Shop	0.05			
2	Gym	0.04			
3	Bakery	0.04			
4	Park	0.04			

Additional Neighborhood Venue Details

- ▶ Another calculation was made for the 10 Most Common Venues for Each Neighborhood
- ▶ Sorting supported the calculation of K-Means Clustering
- ▶ K-Means calculations provide venue patterns in the neighborhoods
- ▶ These patterns in venues and services allow for clustering to identify similarly serviced neighborhoods
- ▶ Clustering allows students and parents to simplify decision-making and identify similar neighborhoods and a best-fit match.
- ▶ Perhaps the student wants a neighborhood a Park and a bakery, our charts tell us that Morningside heights and Upper West Side are excellent choices and share the same cluster.

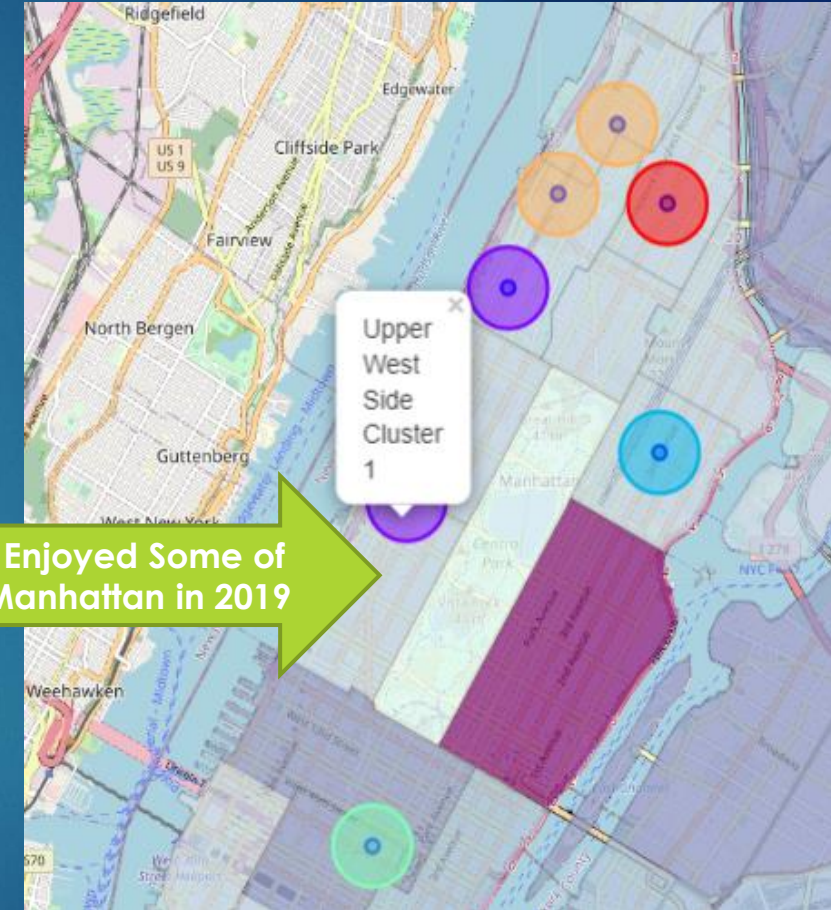
	Location	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0	Central Harlem	Southern / Soul Food Restaurant	African Restaurant	Café	Pizza Place	Seafood Restaurant	Sushi Restaurant	French Restaurant	Bar	Lounge	American Restaurant
1	East Harlem	Mexican Restaurant	Café	Bakery	Pizza Place	Deli / Bodega	Plaza	Thai Restaurant	Italian Restaurant	Coffee Shop	Gym
2	Hamilton Heights	Coffee Shop	Park	Mexican Restaurant	Bar	Café	Yoga Studio	Ethiopian Restaurant	Sushi Restaurant	Deli / Bodega	Chinese Restaurant
3	Manhattanville	Park	Italian Restaurant	American Restaurant	Seafood Restaurant	Mexican Restaurant	Café	Coffee Shop	Cocktail Bar	Indian Restaurant	Tennis Court
4	Midtown	Theater	Plaza	Steakhouse	Coffee Shop	American Restaurant	Gourmet Shop	Hotel	Bookstore	Concert Hall	Cuban Restaurant
5	Morningside Heights	Coffee Shop	Park	Italian Restaurant	American Restaurant	Chinese Restaurant	Grocery Store	Playground	Bookstore	Bakery	Mexican Restaurant
6	Upper West Side	Italian Restaurant	Coffee Shop	Bakery	Café	Gym	Park	American Restaurant	Wine Bar	Bar	Ice Cream Shop

	Borough	Location	Latitude	Longitude	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue
0	Manhattan	Central Harlem	40.815976	-73.943211	0	Southern / Soul Food Restaurant	African Restaurant	Café
1	Manhattan	East Harlem	40.792249	-73.944182	2	Mexican Restaurant	Café	Bakery
2	Manhattan	Hamilton Heights	40.823604	-73.949688	4	Coffee Shop	Park	Mexican Restaurant
3	Manhattan	Manhattanville	40.816934	-73.957385	4	Park	Italian Restaurant	American Restaurant
4	Manhattan	Midtown	40.754691	-73.981669	3	Theater	Plaza	Steakhouse
5	Manhattan	Morningside Heights	40.808000	-73.963896	1	Coffee Shop	Park	Italian Restaurant
6	Manhattan	Upper West Side	40.787658	-73.977059	1	Italian Restaurant	Coffee Shop	Bakery

In Summary: Choosing a Neighborhood

- ▶ Based on the information provided, say our student chose the Upper West Side because they wanted ice cream and wine bars within walking distance of home
- ▶ In addition to the background the SIPA blog provided, our data could tell them the following:


Distance in km between Columbia and Upper West Side is:
2.595422209139266 kms



The Upper West Side Enjoyed Some of the Lowest Crime in Manhattan in 2019

Our student would also enjoy ready access to gyms and parks which would come in handy after all that ice cream!

	Location	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0	Central Harlem	Southern / Soul Food Restaurant	African Restaurant	Café	Pizza Place	Seafood Restaurant	Sushi Restaurant	French Restaurant	Bar	Lounge	American Restaurant
1	East Harlem	Mexican Restaurant	Café	Bakery	Pizza Place	Deli / Bodega	Plaza	Thai Restaurant	Italian Restaurant	Coffee Shop	Gym
2	Hamilton Heights	Coffee Shop	Park	Mexican Restaurant	Bar	Café	Yoga Studio	Ethiopian Restaurant	Sushi Restaurant	Deli / Bodega	Chinese Restaurant
3	Manhattanville	Park	Italian Restaurant	American Restaurant	Seafood Restaurant	Mexican Restaurant	Café	Coffee Shop	Cocktail Bar	Indian Restaurant	Tennis Court
4	Midtown	Theater	Plaza	Steakhouse	Coffee Shop	American Restaurant	Gourmet Shop	Hotel	Bookstore	Concert Hall	Cuban Restaurant
5	Morningside Heights	Coffee Shop	Park	Italian Restaurant	American Restaurant	Chinese Restaurant	Grocery Store	Playground	Bookstore	Bakery	Mexican Restaurant
6	Upper West Side	Italian Restaurant	Coffee Shop	Bakery	Café	Gym	Park	American Restaurant	Wine Bar	Bar	Ice Cream Shop



Our customers, students and parents
desperate for housing guidance,
should come away more confident
in their residential decision after
letting the data help them choose
Where2Live!