

New York City Living

Mark Chintis
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A look into the safest and most family friendly neighborhoods in NYC



Objectives

- Use data from NYC data repositories to help users determine the best neighborhood to live in.
 - “The best neighborhood” is established by low crime rates and available educational services
- Provide an estimate of median rent in the neighborhood chosen

Assumptions

- The user is interested in moving his/her family to NYC.
- The user has school-aged children.
- Rent price is not a determining factor in the choice of neighborhood.

Data Sources

- ▶ Crime data: NYC open data repository - precinct by precinct crime reports
 - ▶ <https://www1.nyc.gov/site/nypd/stats/crime-statistics/borough-and-precinct-crime-stats.page>
- ▶ NYC Department of Education “Quality Schools List” - A list of NYC schools that meet “Quality” review standards:
 - ▶ <https://data.cityofnewyork.us/Education/2018-2019-Quality-Review-School-List/2rr4-rfvc/data>
- ▶ FourSquare API data - locations of all NYC schools
- ▶ PropertyShark.com - Median rent prices in NYC neighborhoods.

Results

- Precincts were evaluated by total number of crimes reported. The top ten safest are in Figure 1:

	Precincts	Total Crimes
0	22	29.0
1	123	140.0
2	76	205.0
3	100	206.0
4	122	238.0
5	112	246.0
6	26	294.0
7	102	301.0
8	30	314.0
9	33	324.0

Figure 1 Ten lowest crime precincts

- Neighborhoods were assessed by total number of available after school activities. The top ten are in Figure 2.

	Neighborhood	Count of After School Activities
0	Brownsville	33
1	East New York	26
2	Washington Heights South	24
3	East Harlem South	23
4	Central Harlem North-Polo Grounds	22
5	Crown Heights North	22
6	Bushwick South	21
7	Hunters Point-Sunnyside-West Maspeth	21
8	Chinatown	21
9	Prospect Lefferts Gardens-Wingate	20

Figure 2 Top 10 neighborhoods with highest amount of after school activities

Results

- The shapely module in Python was used to find the precinct in which the top 10 neighborhoods in Figure 2 are in. The only overlap in Neighborhood and Precinct was Washington Heights South neighborhood in the 33rd precinct (in the Manhattan borough).



Figure 3. Washington Heights neighborhood highlighted in orange

Results

- ▶ Within the 33rd precinct lies Washington Heights South. Inside the boundaries of Washington Heights South, there are 24 locations of after school activities (shown in blue in Figure 4), and there is one school, PS 128, on the NYC quality school list (shown in red in Figure 4).

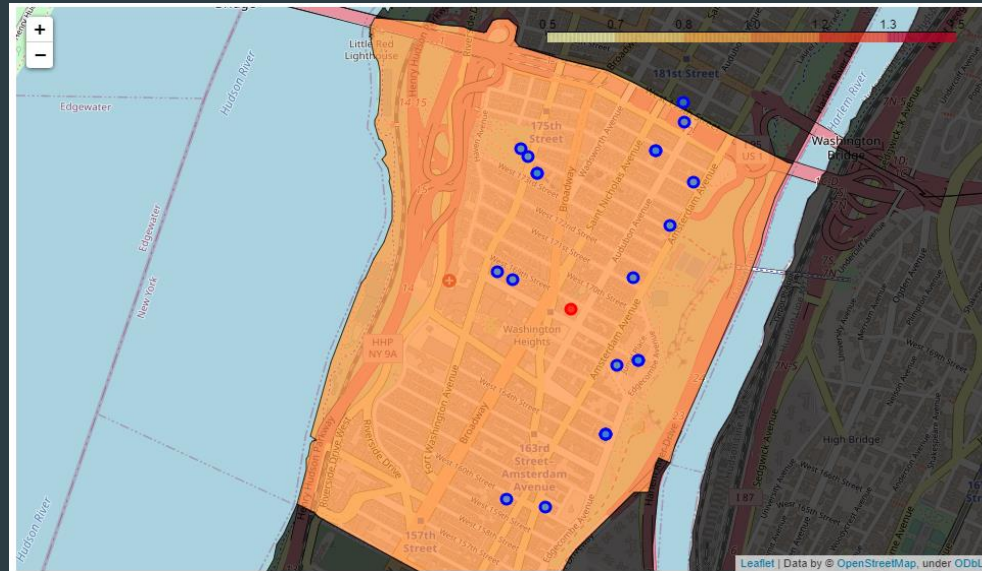


Figure 3 Choropleth map of Washington Heights after school activities(blue) and PS 128(red)

Results

- ▶ Now that we know that Washington Heights South is the safest and perhaps has the best educational services, we provide an estimate of the median rent cost in the neighborhood.
- ▶ PropertyShark.com provides median rent data for only 2006 to 2018. This project assumes the user is moving to NYC in 2020. For this reason, a machine learning algorithm (linear regression) was employed to predict the rent cost in 2020.
- ▶ The final prediction model comes from a 12-fold cross validated and ensemble method. This model is given by,

$$\hat{y}_i = -55566.44 + 28.22x_i + \epsilon_i$$

where \hat{y}_i is the predicted value of median house rent price and x_i is a numerical variable for year. Pearson's correlation coefficient between the predicted values and actual values is 0.97 with p-value < 0.001.

- ▶ The predicted value for median rent price in 2020 is \$1458.16.

Discussion

- ▶ The analyses displayed in this project show how 3 simple life-style choices (safety, after school activities, and quality schools) can affect one's choice in neighborhoods in which to live. This project assumed that cost was no issue and the deliverable of rent price was just an informative number. Provided with more time and data resources, the calculations of the prices of the individual neighborhoods could also be used as a determining factor for overall best neighborhood to live

Conclusion

Although moving to a new city, especially a gigantic one like New York City, the use of algorithms such as the one used in this project can be very useful. Adjustment of simple parameters can help give users a much clearer idea of the place they are moving to than some of the current online resources.