

New York park venues that should be avoided

Introduction

New York is one of the most popular cities in the world. Due to its reputation, each year the city is visited by approximately 40 million tourists from all over the world. The city is divided into 5 Boroughs: Manhattan, Bronx, Brooklyn, Queens, and Staten Island. Each of them is characterized by unique places to visit. All districts have a large number of parks of various sizes. These parks, due to their characteristics, are visited by people who want to rest from concrete buildings.

A very important part of the tour is ensuring yourself and your loved one's safety while watching places that attract attention. We can achieve such security in several ways, the most effective one is to avoid places with a higher risk of a criminal incident.

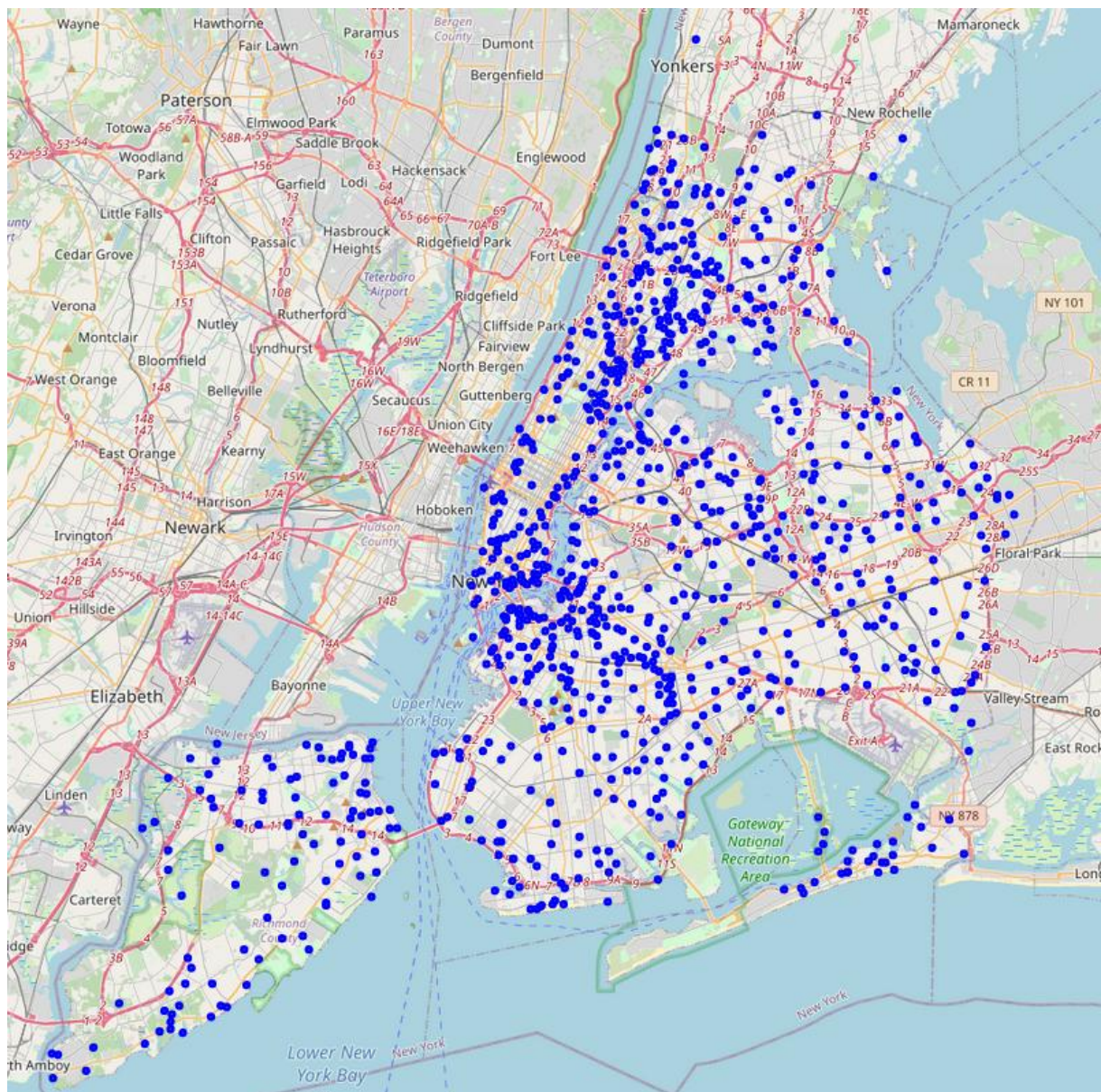
The report presents a list of venues in parks with a higher probability of an incident in which we may be a victim. These places are grouped into two groups: the highly probable and medium probability of a criminal event.

The report has been prepared for groups of people. The first is people who just want to explore the venues in New York's parks (tourists or NY residents). The second group is the NY police, which, after the publication of this report, should increase patrols at the shown locations to ensure public safety.

Data

To expose venues that are more risky, we use data taken from Foursquare. This method allows us to exhibit all venues in specific radius from given place of interest.

In order to show the selected objects, the Folium package will be used, which allows us to display maps of the relevant area. Below is shown a map with marked parks and playgrounds in New York city



The last and most important type of data is data taken from police statistics from 2015-2020 from <https://www1.nyc.gov/site/nypd/stats/crime-statistics/park-crime-stats.page>. These data show the number of crimes committed in parks and playgrounds throughout the city. These data are published in the .xlsx format and are divided into the years from 2015 to 2020 (data for 2021 are still collected), and additionally, each year is divided into 4 quarters. A sample table (excerpt) is shown below

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A	B	C	D	E	F	G	H	I	J	K	L
4th QTRPARK CRIME REPORT											
SEVEN MAJOR COMPLAINTS											
Report covering the period Between Oct 1, 2020 and Dec 31, 2020											
PARK	BOROUGH	SIZE (ACRES)	CATEGORY	MURDER	RAPE	ROBBERY	FELONY ASSAULT	BURGLARY	GRAND LARCENY	GRAND LARCENY OF MOTOR VEHICLE	TOTAL
1 FELHAM BAY PARK	BROOKLYN	2771.147	ONE ACRE OR LARGER	0	0	0	0	0	0	0	0
2 VAN CORTLANDT PARK	BROOKLYN	1148.430	ONE ACRE OR LARGER	0	0	0	0	0	1	0	1
3 ROCKAWAY BEACH AND BOARDWALK	QUEENS	1072.884	ONE ACRE OR LARGER	0	0	0	0	0	0	0	0
4 FRESHILLS PARK	STATEN ISLAND	813.320	ONE ACRE OR LARGER	0	0	0	0	0	0	0	0
5 FLUSHING MEADOWS CORONA PARK	QUEENS	891.680	ONE ACRE OR LARGER	0	0	1	1	1	1	0	4
6 LATOURETTE PARK & GOLF COURSE	STATEN ISLAND	843.970	ONE ACRE OR LARGER	0	0	0	0	0	0	0	0
7 MARINE PARK	BROOKLYN	788.300	ONE ACRE OR LARGER	0	0	0	0	0	0	0	0
8 BELT PARKWAY/SHORE PARKWAY	BROOKLYN/QUEENS	780.430	ONE ACRE OR LARGER	0	0	0	0	0	1	0	1
9 BRONX PARK	BROOKLYN	716.373	ONE ACRE OR LARGER	0	0	2	1	0	1	0	4
10 FRANKLIN D. ROOSEVELT BOARDWALK AND BEACH	STATEN ISLAND	644.350	ONE ACRE OR LARGER	0	0	0	0	0	0	0	0
11 ALLEY FOND PARK	QUEENS	635.514	ONE ACRE OR LARGER	0	0	0	0	0	0	0	0
12 PROSPECT PARK	BROOKLYN	552.250	ONE ACRE OR LARGER	0	0	1	2	0	2	0	5
13 FOREST PARK	QUEENS	506.880	ONE ACRE OR LARGER	0	1	0	0	0	0	0	1
14 GRAND CENTRAL PARKWAY	QUEENS	480.180	ONE ACRE OR LARGER	0	0	0	0	0	0	0	0
15 FERRY POINT PARK	BROOKLYN	413.300	ONE ACRE OR LARGER	0	0	0	0	0	0	0	0
16 CONEY ISLAND BEACH & BOARDWALK	BROOKLYN	385.203	ONE ACRE OR LARGER	0	0	0	0	0	0	0	0

The presented data in table is processed as follows:

- Combining all quarters into one year
- Using the Nominatim package to determine the geographic coordinates of all parks listed in the table
- The use of machine learning to cluster the parks into three groups that are characterized by: high, medium and negligible number of crimes committed on parks area.
- With the help of Foursquare, designate venues in parks from the high and medium risk cluster group
- Plotting data on a NY map using the Folium package