

New York City Travel Guide 87

# Applied Data Science Course – IBM Data Science Final Project The Battle of Neighborhoods

Analysis of Recommended Places for  
Tourists by A Travel Agency

New York City Vacation Packages  
• Where to Stay • What to Do • When to Visit  
• Where to Eat • How to Get Here • Bucket List Events  
Sending Thousands of People to New York City...  
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# Identification Problem



- • Rental Car Location.
- • Bank.
- • Nightclub.
- • Theater,
- • Movie Theater.
- • National Park.

# Data Needed for the Project

1. The address of Pennsylvania Hotel in Manhattan NYC, which let me find the Latitude and Longitude using FourSquare. This information is important since it will help to locate the places of leisure, entertainment and services located near the lodging hotel.



2. Once I got the Latitude and Longitude of the Hotel, I could be able to find the places of leisure, entertainment and services that are located near the hotel. The FourSquare API helps to find these data.

- Rental Car Location.
- Bank.
- Nightclub.
- Theater,
- Movie Theater.
- National Park.

# DATA PREPARATION

- Using the address: 401 7th Ave, New York City, NY 10001 and the FourSquare API:

**<https://api.foursquare.com/v2/venues/search?>**

With the appropriate parameters I could get: the latitude and longitude

**Latitude:** 40.749904 **Longitude:** -73.99104

- Once I got the Latitude and Longitude of the hotel, I could find the venues related with the categories that the tourist wants to know using Foursquare API with the following parameters:

**<https://api.foursquare.com/v2/venues/explore?>**

Categories to search: Rental Car Location, Bank, Nightclub, Theater, Movie Theater, National Park.

- Latitude
- Longitude
- Query [Categories]

# DATA PREPARATION

- I have normalized the results using: json\_normalize and move to a Pandas' Dataframe and this is the following result:

	Category	Name	ID	Address	Lat	Lng
0	Rental Car Location	Enterprise Rent-A-Car	4ad49a36f964a5204fe820e3	106 W 24th St	40.743671	-73.992900
1	Rental Car Location	Enterprise Rent-A-Car	4b60f29bf964a520fb022ae3	667 11th Ave	40.765045	-73.995458
2	Rental Car Location	Enterprise Rent-A-Car	4ba7e70cf964a52045bd39e3	403 E 65th St	40.763286	-73.958469
3	Rental Car Location	Hertz	4ba4d846f964a5208dba38e3	210 W 77th St	40.782047	-73.979798
4	Rental Car Location	Hertz	4bffd279f326ef3bcc2d0604	337 East 64th Street	40.763184	-73.960190
5	Rental Car Location	National Car Rental	4c28ab99d26eb713e64914d1	219 W 77th St	40.782299	-73.980380
6	Rental Car Location	National Car Rental	4e1591fbb61c42e7c54bfba0	252 W 40th St	40.755978	-73.990261

# Verifying Categories

- I have a limited account, so I have gotten the following venues order by category:

Category	Category
Bank	50
Movie Theater	50
National Park	12
Nightclub	50
Rental Car Location	50
Theater	50





## Banks located near to the Hotel

- Using Folium library and the results obtained from FourSquare, is possible to generate map with venues by categories, in the following graphic is about the banks near to the Hotel

# Calculating Distance

- With Geodesic Python Library is possible to calculate the distance between the venues and the hotel, using lat. & Lng in the parameters:

`distance = round(geodesic(origin, destine).miles, 2)`

Including it in a loop and our DataFrame data containing Lat & Lng of each venues is was possible to update the dataframe with the distance value of each venue.

Name	ID	Address
IC Bank	4cbf6aaa8db3b60c0a337878	11 Penn Plz, 7th & W 31st St
se Bank	4b5dd8bbf964a5205e6f29e3	510 Park Ave
se Bank	4ba272b8f964a520f7f937e3	181 E 90th St
se Bank	4c5186555ee81b8da6476200	994 1st Ave
ls Fargo	4d6fc709a045721ec8792ab8	666 3rd Ave
ne Bank	4c4f2398f53d0f47c5aaada7	845 Third Ave
se Bank	4bcf6c01462cb71375add607	126 E 86th St
se Bank	4bc364554cdfc9b68a479721	633 3rd Ave
se Bank	4bdc7acbc79cc9287dbe86e9	1495 York Ave
se Bank	4d20ed27e56f6ea89a27791d	201 E 79th St



# Likes and Rating



To get the 'Likes' and 'Rating' we need the Venue ID which we got in the DataFrame and we have to use the FourSquare API:



<https://api.foursquare.com/v2/venues/>



I used this API within a loop to get 'Likes' and 'Rating' and add two new columns to our DataFrame and filled with the ID venue parameter required to use.

# DataFrame Including Distance, Likes y Rating

	Category	Name	ID	Address	Lat	Lng	Distance	Likes	Rating
0	Bank	PNC Bank	4cbf6aaa8db3b60c0a337878	11 Penn Plz, 7th & W 31st St	40.749092	-73.991528	0.06	6	6.6
1	Rental Car Location	Avis Car Rental	4b7aa259f964a5209a342fe3	220 West 31st Street	40.749555	-73.993390	0.13	1	6.5
2	Bank	Chase Bank	4c0182fef7ab0f47024316b6	1260 Broadway	40.748416	-73.987626	0.21	5	6.1
3	Movie Theater	AMC 34th Street 14	45b893e3f964a520cf411fe3	312 W 34th St	40.752479	-73.994403	0.25	1253	6.5
4	Rental Car Location	Hertz	4c083dd37e3fc928040bf082	323 West 34th Street	40.752821	-73.994522	0.27	5	5.7
5	Rental Car Location	U-Haul Neighborhood Dealer	5263df76498ebb8d61ce2f86	629 W 50th Street	40.748627	-73.996131	0.28	1	6.5
6	Nightclub	Liberty Hall at Ace Hotel New York	4b65fd87f964a520f00c2be3	20 W 29th St	40.745838	-73.988097	0.32	25	7.0
7	Nightclub	230 Fifth Rooftop Lounge	4459f9bff964a520e1321fe3	230 5th Ave	40.744232	-73.988660	0.41	2759	8.0
8	Theater	Nederlander Theatre	4ef22ce4722eb49f525d2b06	208 W 41st St	40.755708	-73.988386	0.42	220	8.9
9	Rental Car Location	National Car Rental	4e1591fbb61c42e7c54bfba0	252 W 40th St	40.755978	-73.990261	0.42	1	6.9

```

Showing the top 5 Rating by Category
datanyc_Group = Datatnyc.groupby(['Category', 'Name', 'Address', 'Distance']).agg({'Rating':max})
orted_Data= Datatnyc_Group['Rating'].groupby(level=0, group_keys=False)
orted_Data.nlargest(5)

```

Category	Name	Address	Distance
Bank	Chase Bank	2824-26 Broadway	3.92
	JPMorgan Chase & Co. World Headquarters	270 Park Ave	0.93
	Chase Bank	610 Madison Ave	1.37
	Citibank	717 Avenue of the Americas	0.48
	TD Bank	1709 3rd Ave	3.26
Cinema Theater	Metrograph	7 Ludlow St	2.41
	Regal Essex 14 & RPX	129 Delancey St	2.20
	AMC Loews 84th Street 6	2310 Broadway	2.64
	Film Forum	209 W Houston St	1.64
	IFC Center	323 Avenue of the Americas	1.40
Central Park	Central Park	59th St to 110th St	2.73
	American Museum of Natural History	200 Central Park W	2.33
	Statue of Liberty	Liberty Island	5.03
	Governors Island	10 South Street New York, NY 10004-1921	4.44
	Gramercy Park	btwn Gramercy Park N & S	0.87
Nightclub	Le Bain	848 Washington St	1.11
	Studio 54	254 W 54th St	1.04
	Basement	52-19 Flushing Ave.	4.68
	Bathtub Gin	132 9th Ave	0.77
	Nublu	62 Avenue C	1.97
Rental Car Location	Sixt Rent A Car	20 Morris St	3.26
	Enterprise Rent-A-Car	106 W 24th St	0.44
	Hertz	18 Morton Street	1.46
	Enterprise Rent-A-Car	667 11th Ave	1.07
		221 Thompson St	1.48
Theater	Lincoln Center for the Performing Arts	70 Lincoln Center Plz	1.60
	Minskoff Theatre	1515 Broadway	0.59
	David H. Koch Theater	Lincoln Center Plaza	1.60
	New Amsterdam Theater	214 W 42nd St	0.43
	Radio City Music Hall	1260 Avenue of the Americas	0.92

name: Rating, dtype: float64

# Reports Generated

## Top 'Rating' venues by Category

# Reports Generated

## Top 'Likes' venues by Category

# Showing the top 10 Likes by Category

```
Datanyc_Group1 = Datanyc.groupby(['Category', 'Name', 'Address']).agg({'Likes':max})
```

```
Sorted_Data1= Datanyc_Group1['Likes'].groupby(level=0, group_keys=False)
```

```
Sorted_Data1.nlargest(5)
```

Category	Name	Address	
Bank	JPMorgan Chase & Co. World Headquarters	270 Park Ave	139
	Wells Fargo	1755 Broadway	16
	Citibank	717 Avenue of the Americas	13
	TD Bank	47 3rd Ave	13
	Chase Bank	2824-26 Broadway	11
Movie Theater	AMC Lincoln Square 13	1998 Broadway	2826
	AMC Empire 25	234 W 42nd St	2226
	Regal Union Square ScreenX & 4DX	850 Broadway	2213
	AMC Kips Bay 15	570 2nd Ave	1633
	Regal Battery Park	102 North End Ave.	1374
National Park	Central Park	59th St to 110th St	21541
	American Museum of Natural History	200 Central Park W	11409
	Statue of Liberty	Liberty Island	4275
	Governors Island	10 South Street New York, NY 10004-1921	915
	Gramercy Park	btwn Gramercy Park N & S	297
Nightclub	230 Fifth Rooftop Lounge	230 5th Ave	2759
	Webster Hall	125 E 11th St	1625
	Le Bain	848 Washington St	1576
	Lavo	39 E 58th St	1432
	Bathtub Gin	132 9th Ave	1244
Rental Car Location	Avis Car Rental	225 East 43rd Street, (Between 2nd Ave & 3rd Ave)	19
	Hertz	310 East 48th Street	17
	Enterprise Rent-A-Car	221 Thompson St	13
		106 W 24th St	11
	Hertz	355 East 76th Street	11
Theater	Radio City Music Hall	1260 Avenue of the Americas	3287
	The McKittrick Hotel	530 W 27th St	1394
	Lincoln Center for the Performing Arts	70 Lincoln Center Plz	1368
	Minskoff Theatre	1515 Broadway	1327
	Beacon Theatre	2124 Broadway	1269

```
# The top 10 Category by minimum Distance to the Hotel
```

```
Datnyc_Group = Datnyc.groupby(['Category','Name', 'Address']).agg({'Distance':max})
```

```
Sorted_Data= Datnyc_Group['Distance'].groupby(level=0, group_keys=False)
```

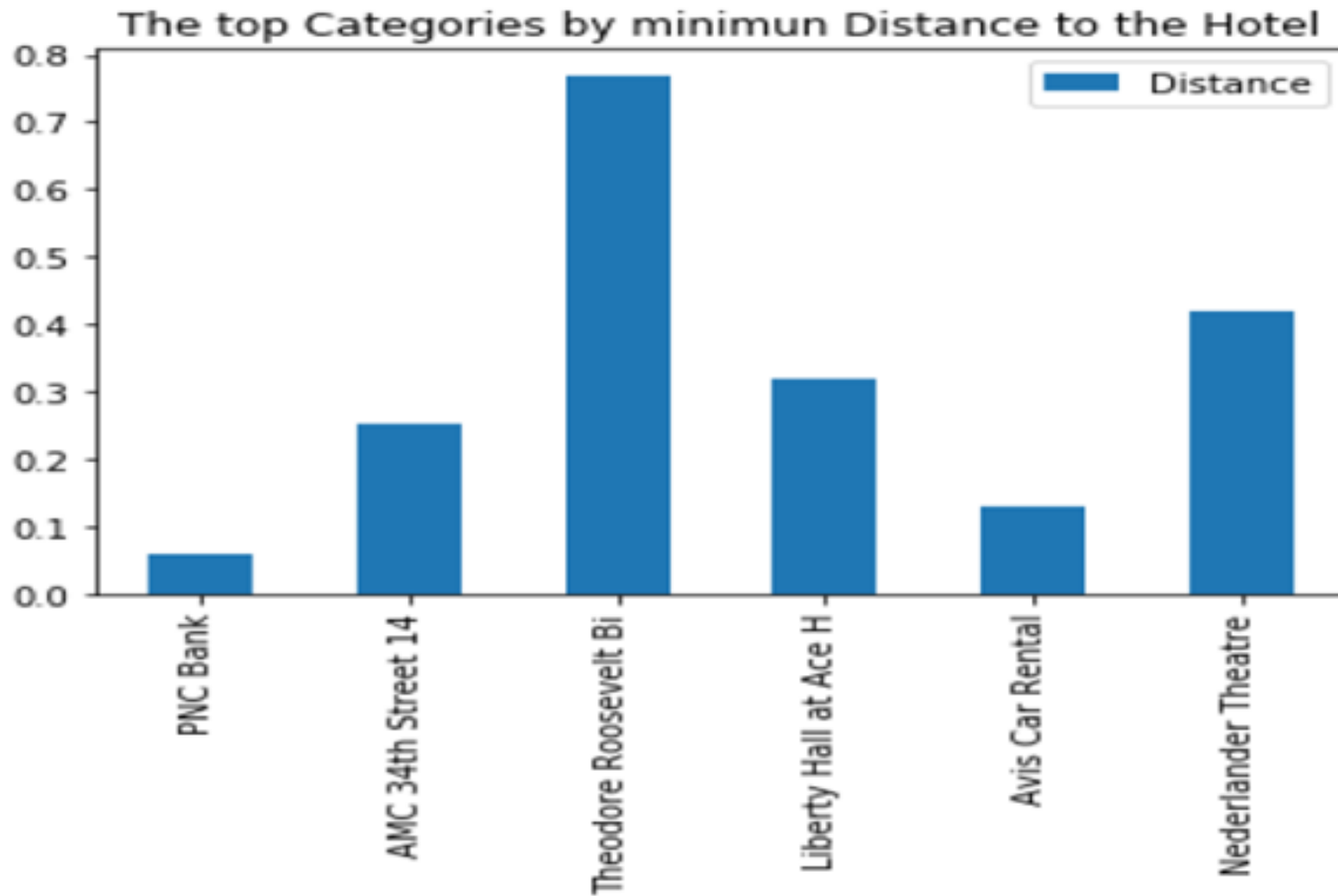
```
Sorted_Data.nsmallest(5)
```

Category	Name	Address
Bank	PNC Bank	11 Penn Plz, 7th & W 31st St
	Chase Bank	1260 Broadway
	Citibank	717 Avenue of the Americas
	Chase Bank	2 Park Ave
	Wells Fargo Bank	500 W 30th St
Movie Theater	AMC 34th Street 14	312 W 34th St
	AMC Empire 25	234 W 42nd St
	Cinépolis Chelsea	260 W 23rd St
	Regal E-Walk 4DX & RPX	247 W. 42nd St.
	The POP Bag	260 W 23rd St
National Park	Theodore Roosevelt Birthplace National Historic Site	28 E 20th St
	Gramercy Park	btwn Gramercy Park N & S
	Stonewall National Monument	Christopher Street
	American Museum of Natural History	200 Central Park W
	Columbus Park	49 Mulberry St
Nightclub	Liberty Hall at Ace Hotel New York	20 W 29th St
	230 Fifth Rooftop Lounge	230 5th Ave
	The Seville	22 E 29th St
	Sky Room	330 W 40th St
	Squares	East 26th
Rental Car Location	Avis Car Rental	220 West 31st Street
	Hertz	323 West 34th Street
	U-Haul Neighborhood Dealer	629 W 50th Street
	National Car Rental	252 W 40th St
	Enterprise Rent-A-Car	106 W 24th St
Theater	Nederlander Theatre	208 W 41st St
	New Amsterdam Theater	214 W 42nd St
	Lyric Theatre	213 W 42nd St
	Aladdin @ New Amsterdam Theatre	214 West 42nd Street, New York, NY 10036
	SVA Theatre	333 W 23rd St

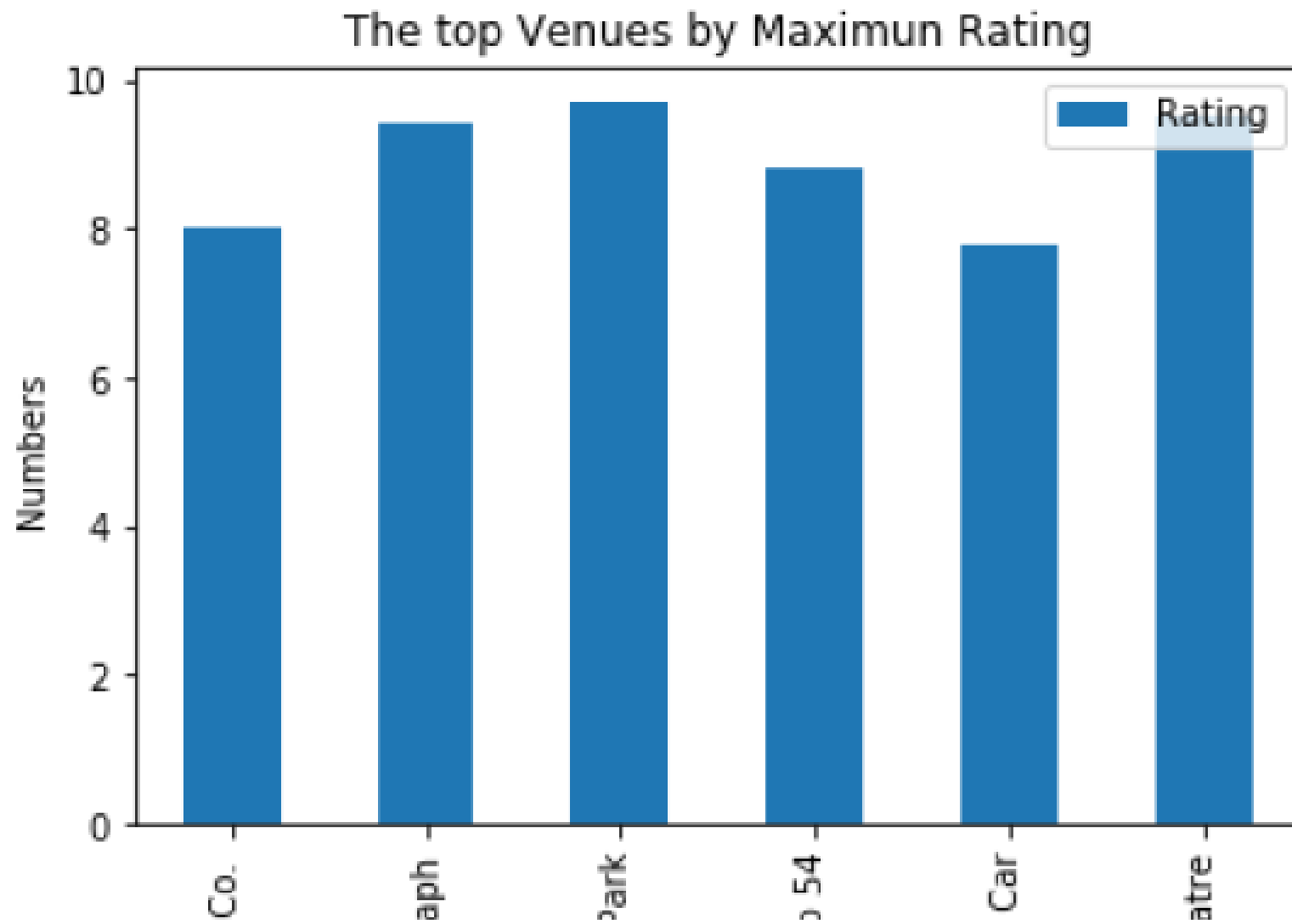
# Reports Generated

## Top 'Closest' venues by Category



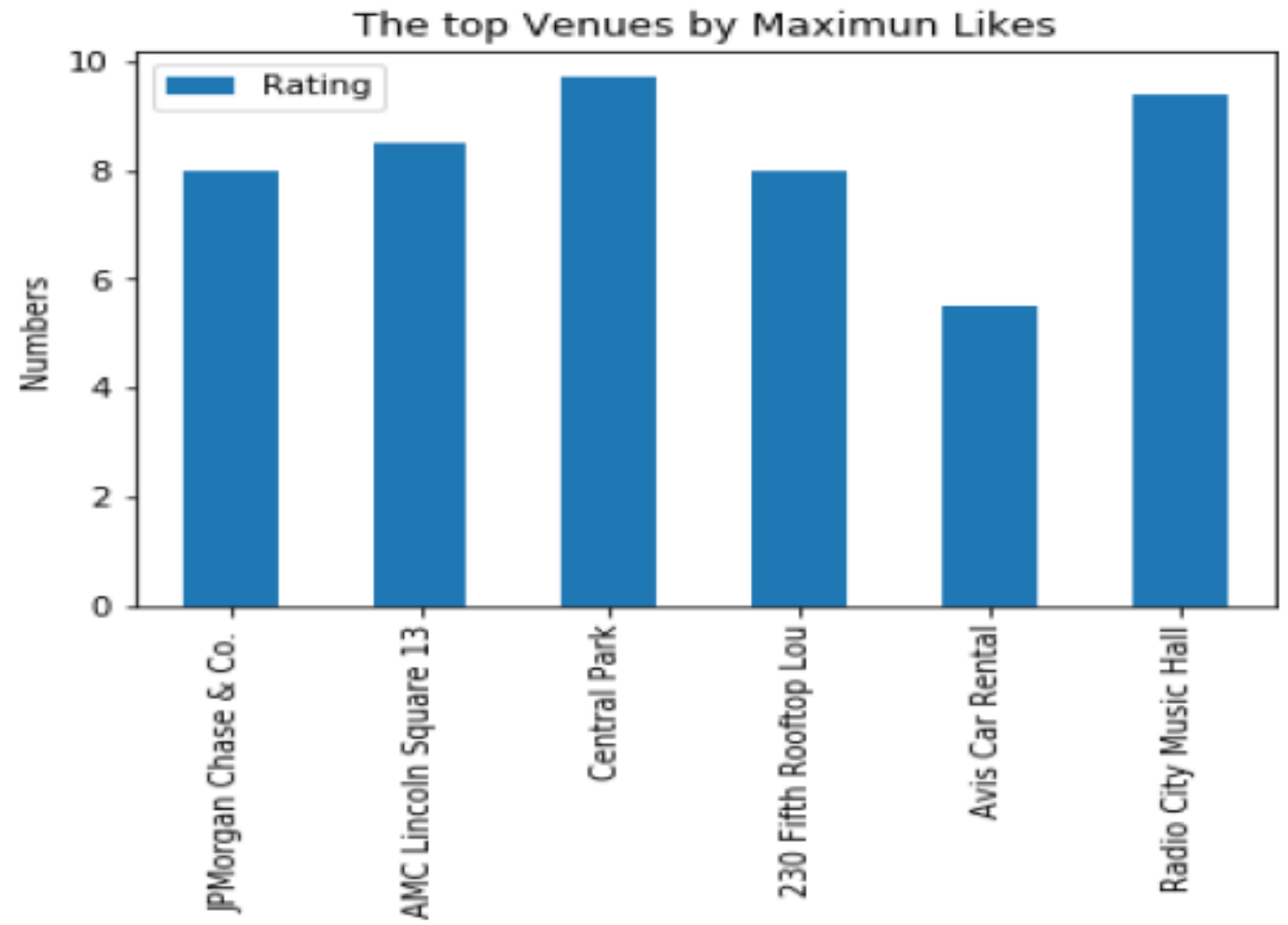


Bar Chart  
Generated



Bar Chart  
Generated

Bar Chart  
Generated



# Conclusion

- The purpose of this project has been satisfied the requirement of tourist about specifics category venues:
  - Rental Car Location.
  - Bank.
  - Nightclub.
  - Theater,
  - Movie Theater.
  - National Park.

Containing information like:

- List or report of the places of leisure, entertainment and services located near the hotel.
- Distance between the hotel and the places.
- List by categories.
- List by Rating.
- Venue's Like List.
- Maps displaying localized places.

This information requested by the tourist has been possible using the analysis tools and the Foursquare API. It can include many improvements of course, including the main categories of places that a tourist may need in advance to help him better plan his stay and even help to plan reservations for tourist places, restaurants, ballroom, etc.