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## Capstone project W5 report- FunX Tours

### Introduction/ Business problem

FunX Tours, a tour operating startup in the New York city, has decided to utilize data science techniques in order to differentiate itself from the very competitive tourism market in New York.

FunX Tours targets the 25-35 year olds as its customers as they think this group likes to explore trendy venues and is willing to allocate a large traveling budget.

However, this group of customers is also not afraid to post negative comments about a venue or even FunX Tours if they find the tour agenda is less than satisfactory. Therefore, FunX needs to carefully select its itinerary, and frequently updates it.

FunX Tours has approached us to apply data science to help them achieve its goal.

### Data description

New York has many boroughs and neighborhoods. In order to explore them, we will need a dataset that contains the data about these boroughs and neighborhoods, as well as the latitudes and longitudes. We will look to the readily available dataset published in [https://geo.nyu.edu/catalog/nyu\\_2451\\_34572](https://geo.nyu.edu/catalog/nyu_2451_34572). The geographical data contained on this site gives us a good starting point for a big picture of New York.

For location data, we will utilize Foursquare API in order to explore and segment the neighborhoods. Foursquare contains a comprehensive location data about many venues that we will be able to segment and rank, in order for FunX to program the itinerary to recommend to its target customers. FunX's criteria are:

A. Tour activities are organized in one neighborhood only for time consuming and easy transportation;

## B. Venues for tour activities

1. Places of interest
2. Restaurants for authentic American foods
3. Bars or night clubs
4. Shops

## Methodology

1. I transformed the latitude and longitude data in [https://geo.nyu.edu/catalog/nyu\\_2451\\_34572](https://geo.nyu.edu/catalog/nyu_2451_34572) into data frame.
2. The geographic data in 1 contains a total of 5 boroughs and 306 neighborhoods. Given that FunX's tour itinerary consists 1 or 2-day package, I will focus on exploring Manhattan.
3. I will utilize the Foursquare API to explore the neighborhoods in "Manhattan" only. I will get the top 100 venues that are in all neighborhoods in Manhattan within a radius of 500 meters.
4. I will use k-means to cluster the neighborhoods into 5 clusters. Using the results, I can then organize transportation and schedule given the proximity map generated by k-means.
5. I will rank Manhattan neighborhoods by 10 most common venues and organize our tour packages.

## Results

I will try to pack all activities into 1-day tour as I give the tour customers a full and impressive day tours. FunX has given us its criteria for visiting venues: 1. Places of interest; 2. Restaurants for authentic American foods; 3. Bars or nightclubs; 4. Shops.

After careful examination of neighborhood data, I found that Midtown meets FunX's criteria as follows:

1. Places of interest: Theater (4th most common venue)

2. Restaurants for authentic American foods: American Restaurant (7th most common venue), steakhouse (3rd most common venue)
  3. Bars or nightclubs: Cocktail Bar (5th most common venue)
  4. Shops: Clothing Store (1st most common venue), Bookstore (8th most common venue)
- **Midtown neighborhood fits all FunX's criteria**

	Neighborhood	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
6	Central Harlem	African Restaurant	French Restaurant	American Restaurant	Gym / Fitness Center	Public Art	Cosmetics Shop	Chinese Restaurant	Seafood Restaurant	Pizza Place	Event Space
8	Upper East Side	Italian Restaurant	Exhibit	Coffee Shop	Juice Bar	Bakery	Gym / Fitness Center	Boutique	Hotel	Art Gallery	French Restaurant
13	Lincoln Square	Gym / Fitness Center	Theater	Café	Concert Hall	Plaza	Italian Restaurant	Opera House	French Restaurant	Indie Movie Theater	Performing Arts Venue
14	Clinton	Theater	Gym / Fitness Center	American Restaurant	Hotel	Spa	Wine Shop	Italian Restaurant	Gym	Lounge	Food Court
15	Midtown	Clothing Store	Hotel	Steakhouse	Theater	Cocktail Bar	Spa	American Restaurant	Bookstore	Bakery	Coffee Shop



## Discussions

Apart from meeting FunX's criteria, I noted that the 2nd most common venue happens to be Hotel. This is great for FunX to include the hotel recommendation into its 2-day tour itinerary. Although the hotels in Midtown will likely be expensive in terms of room rates, this shouldn't be a problem given that FunX targets 25 to 35 age group who don't mind paying for convenience after a day of sightseeing.

I also noted that Spa happens to be the 6th most common venue in Midtown. I think FunX can also include this venue in its more premium tour itinerary, or FunX can collaborate with spa operators.

To include the above discussed, a premium tour itinerary will include the 1st to 8th most common venues in Midtown.

## Conclusion

After careful examination of neighborhood data and the neighborhood's common venues, we will suggest the tour itinerary to FunX as follows. A suggested tour itinerary for Midtown New York will be like this:

FunX Tours Premium itinerary	Midtown
8am-9am	Breakfast - Coffee shop
9am-11am	Sight-seeing Midtown
11am-12pm	Shopping- Clothing store
12pm-2pm	Steakhouse
2pm-4pm	Shopping- Clothing store and bookstore
4pm-6pm	Spa
6pm-8pm	American restaurant
8pm-10pm	Theater
10pm-11pm	Cocktail bar
11pm-	Hotel