A dark blue vertical bar on the left side of the page. A blue arrow points to the right from the bar, containing the date 6/21/2020.

6/21/2020

APPLIED CAPSTONE PROJECT- COURSERA

STORE LOCATION ANALYSIS

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Nagaraj, Srinivas
JUNE 2020

1. Introduction

1.1 Background

A family owned furniture business is facing challenges due to sudden lockdown initiated to control COVID-19 spread. Being a brick and mortar store based out Vinings, Atlanta it is vital to keep costs down to ensure sufficient cash flow. Their primary suppliers and vendors are based out of New York and the uneven lockdowns have disrupted their supply chain

1.2 Business Challenge

Unfortunately, the store fell victim to ongoing unrest and incurred significant damage due to rioting and looting. The management has hereby decided to move the store due following reasons:

1. Lack of timely state aid to deal with damage
2. Closer to suppliers helps to reduce shipping costs
3. Current lease is about to expire

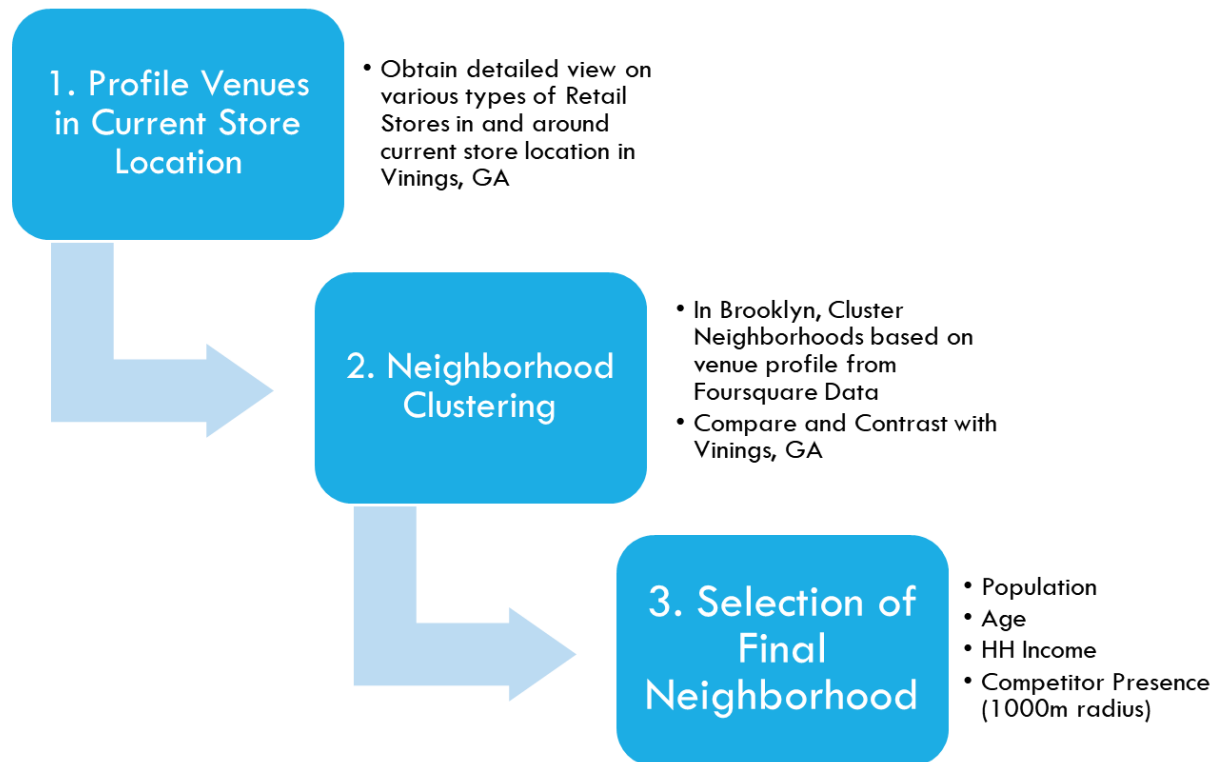
The store is quite popular among older demographic with families who have high household Income. They have also launched a new brand to attract Millennials and is just getting noticed and are scouting locations in Brooklyn, New York City to find ideal location to establish their store. They also intend to have a clear picture of their competitors in each neighborhood

2. Data Sources

We are depending on the following data sources to draw our conclusions. It includes a mix of Foursquare data and Census data related to Demographics

| S.No | Analysis | Data Source | Comment |
|------|--|--|---|
| 1. | Competitor Locations | Foursquare | Plotting competitor locations around prospective site |
| 2. | Venue Profile | Foursquare | Venue Profile in Neighborhoods |
| 3. | Demographic <ul style="list-style-type: none">• Population• Age• HH Income | Statisticalatlas.com | Detailed view on Brooklyn Demographics |
| 4. | Demographic-Vinings | niche.com/places-to-live worldpopulationreview.com/us-cities/ | Vinings Profile |

3. Methodology



3.1 Vinings, GA

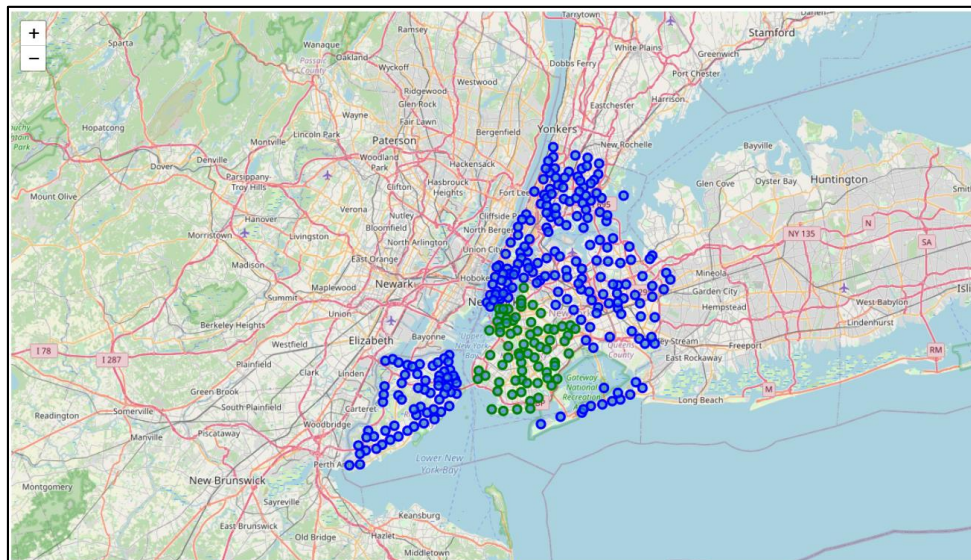
- Our Furniture Store is located at '2860 Cumberland Mall SE, Atlanta, GA 30339, United States'
- Vinings has population with Median Age of 34.3 years
- Neighborhood is dominated by presence of Clothing Stores, Hotels, American and Italian Restaurants, Cosmetics, Jewelry and Shoe Stores
- 76 venues exist within a radius of 500m of our store

| Measure | |
|-----------------------|----------|
| Population | 13086.00 |
| Growth Rate (%) | 34.44 |
| Median Age | 34.30 |
| Median HH Income (\$) | 46201.00 |
| Unemployment Rate(%) | 2.40 |
| Homeownership Rate(%) | 34.40 |
| Marriage Rate(%) | 40.60 |

| | |
|---------------------|---|
| categories | |
| Clothing Store | 8 |
| Hotel | 5 |
| American Restaurant | 5 |
| Cosmetics Shop | 5 |
| Jewelry Store | 3 |
| Shoe Store | 3 |
| Italian Restaurant | 2 |
| Kids Store | 2 |
| Lingerie Store | 2 |
| Men's Store | 2 |
| Sandwich Place | 2 |
| Wings Joint | 2 |
| Bakery | 2 |
| Restaurant | 2 |
| Chinese Restaurant | 1 |
| Grocery Store | 1 |
| Coffee Shop | 1 |
| Convention Center | 1 |
| Bus Station | 1 |
| Deli / Bodega | 1 |
| Department Store | 1 |
| Breakfast Spot | 1 |
| Boutique | 1 |
| Bank | 1 |
| Electronics Store | 1 |
| Asian Restaurant | 1 |
| Food Court | 1 |
| Juice Bar | 1 |
| Intersection | 1 |
| Smoke Shop | 1 |
| Video Game Store | 1 |
| Theme Restaurant | 1 |
| Supplement Shop | 1 |
| Spa | 1 |
| Snack Place | 1 |
| Smoothie Shop | 1 |
| Shopping Mall | 1 |
| Warehouse Store | 1 |
| Seafood Restaurant | 1 |
| Pizza Place | 1 |

3.2 Neighborhood Clustering

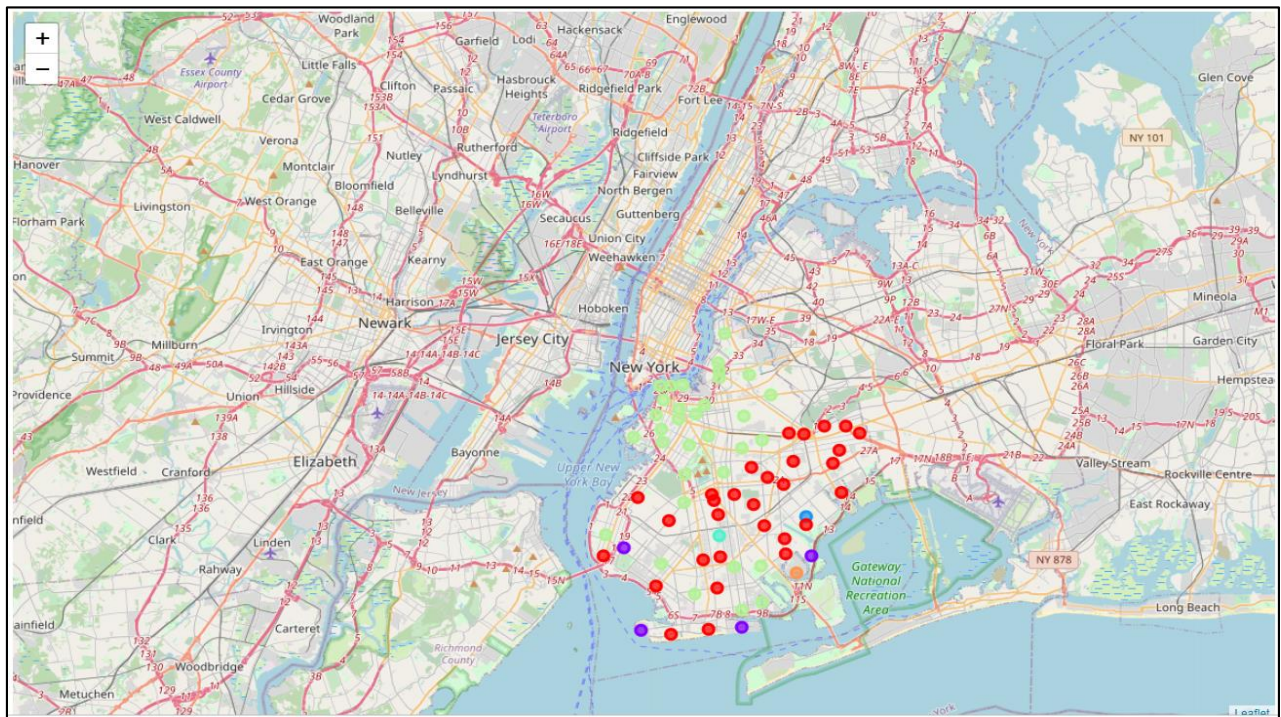
- New York City has a total 306 Neighborhoods and 5 Boroughs
- Store Management have decided to move to Brooklyn (Green)
- Choose best neighborhood in Brooklyn based on Foursquare Data and other factors like Population, Age, HH Income and Competitors



3.3 Final Selection

- Need to understand how similar or dissimilar are the neighborhoods w.r.t to each other and Vinings location
- After selecting best cluster, identify top neighborhood in it based on Population, Age, HH Income
- Analyzing Furniture Competitors presence is also crucial before making final decision

4. Results



Division of 70 Brooklyn Neighborhoods into 6 different Clusters based on Elbow Plot and feasibility of study

Cluster-0 (Red)

```
Brooklyn_merged.loc[Brooklyn_merged['Cluster Labels'] == 0, Brooklyn_merged.columns[[1] + list(range(5, Brooklyn_merged.shape[1]))]].head(10)
```

| | 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 |
|----|-------------------|-----------------------|-----------------------|---------------------------|-----------------------------|-----------------------|-----------------------|-----------------------|-------------------------------|--------------------------|------------------------|
| 2 | Sunset Park | Pizza Place | Mobile Phone Shop | Latin American Restaurant | Bank | Bakery | Mexican Restaurant | Fried Chicken Joint | Deli / Bodega | Gym | Video Game Store |
| 5 | Brighton Beach | Restaurant | Russian Restaurant | Beach | Eastern European Restaurant | Bank | Gourmet Shop | Sushi Restaurant | Mobile Phone Shop | Mediterranean Restaurant | Bakery |
| 7 | Manhattan Terrace | Pizza Place | Ice Cream Shop | Donut Shop | Cosmetics Shop | Spa | Jazz Club | Bakery | Bagel Shop | Grocery Store | Steakhouse |
| 8 | Flatbush | Coffee Shop | Chinese Restaurant | Mexican Restaurant | Juice Bar | Caribbean Restaurant | Bank | Lounge | Bagel Shop | Donut Shop | Grocery Store |
| 10 | East Flatbush | Moving Target | Supermarket | Liquor Store | Caribbean Restaurant | Park | Chinese Restaurant | Fast Food Restaurant | Pharmacy | Department Store | Food & Drink Shop |
| 14 | Brownsville | Chinese Restaurant | Moving Target | Spanish Restaurant | Fried Chicken Joint | Playground | Pizza Place | Convenience Store | Pharmacy | Restaurant | Performing Arts Venue |
| 25 | Cypress Hills | Fried Chicken Joint | Spanish Restaurant | Latin American Restaurant | Pizza Place | Ice Cream Shop | Donut Shop | Fast Food Restaurant | Metro Station | Coffee Shop | Discount Store |
| 26 | East New York | Deli / Bodega | Asian Restaurant | Fried Chicken Joint | Metro Station | Bus Station | Fast Food Restaurant | Caribbean Restaurant | Latin American Restaurant | Music Venue | Plaza |
| 27 | Starrett City | Supermarket | Pharmacy | Liquor Store | Caribbean Restaurant | Pizza Place | American Restaurant | Convenience Store | Bus Stop | Bus Station | River |
| 29 | Flatlands | Pharmacy | Caribbean Restaurant | Fried Chicken Joint | Fast Food Restaurant | Nightclub | Lounge | Bar | Paper / Office Supplies Store | Park | Chinese Restaurant |

Cluster-0 is dominated by Pizza, Various restaurant types like Chinese, Spanish, Caribbean, Russian. We also have Cosmetics shop, American Restaurant

Cluster-1 (Purple)

```
Brooklyn_merged.loc[Brooklyn_merged['Cluster Labels'] == 1, Brooklyn_merged.columns[[1] + list(range(5, Brooklyn_merged.shape[1]))]].head(10)
```

| | 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 |
|----|-----------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------------|
| 31 | Manhattan Beach | Café | Sandwich Place | Bus Stop | Food | Ice Cream Shop | Playground | Beach | Harbor / Marina | Factory | Falafel Restaurant |
| 35 | Dyker Heights | Dance Studio | Park | Golf Course | Burger Joint | Bagel Shop | Bus Station | Fast Food Restaurant | Factory | Falafel Restaurant | Farm |
| 39 | Sea Gate | Spa | Sports Club | American Restaurant | Beach | Bus Station | Field | Factory | Falafel Restaurant | Farm | Farmers Market |
| 45 | Bergen Beach | Harbor / Marina | Park | Baseball Field | Playground | Athletics & Sports | Farmers Market | Event Space | Factory | Falafel Restaurant | Farm |

Cluster-1 has total of 4 neighborhoods only and is made up Open spaces like Park, Sports Club, Marina, Playground

Cluster-2 (Blue)

```
Brooklyn_merged.loc[Brooklyn_merged['Cluster Labels'] == 2, Brooklyn_merged.columns[[1] + list(range(5, Brooklyn_merged.shape[1]))]].head(10)
```

| | 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 |
|----|--------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------------|
| 28 | Canarsie | Caribbean Restaurant | Asian Restaurant | Grocery Store | Gym | Thai Restaurant | Food | Fish Market | Fish & Chips Shop | Filipino Restaurant | Field |

There is only 1 neighborhood in this cluster and top venues are Fish Market, Caribbean Restaurant, Grocery Store, Farm and Fields

Cluster-3 (Aqua)

```
Brooklyn_merged.loc[Brooklyn_merged['Cluster Labels'] == 3, Brooklyn_merged.columns[[1] + list(range(5, Brooklyn_merged.shape[1]))]].head(15)
```

| | 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 |
|----|--------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------------|
| 46 | Midwood | Pizza Place | Ice Cream Shop | Pharmacy | Bakery | Video Game Store | Candy Store | Convenience Store | Fish Market | Fish & Chips Shop | Flower Shop |

The key distinguishing features include presence of Pizza Place, Ice Cream shop, Bakery and Pharmacy

Cluster-5 (Orange)

```
Brooklyn_merged.loc[Brooklyn_merged['Cluster Labels'] == 5, Brooklyn_merged.columns[[1] + list(range(5, Brooklyn_merged.shape[1]))]].head(15)
```

| | 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 |
|----|--------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------------|
| 30 | Mill Island | Pool | Other Repair Shop | Yoga Studio | Fast Food Restaurant | Event Space | Factory | Falafel Restaurant | Farm | Farmers Market | Field |

Last Cluster is made of only 1 neighborhood consisting of Pool, Yoga Studio, Factory

Cluster-4 (Green)

```
Brooklyn_merged.loc[Brooklyn_merged['Cluster Labels'] == 4, Brooklyn_merged.columns[[1] + list(range(5, Brooklyn_merged.shape[1]))]].head(15)
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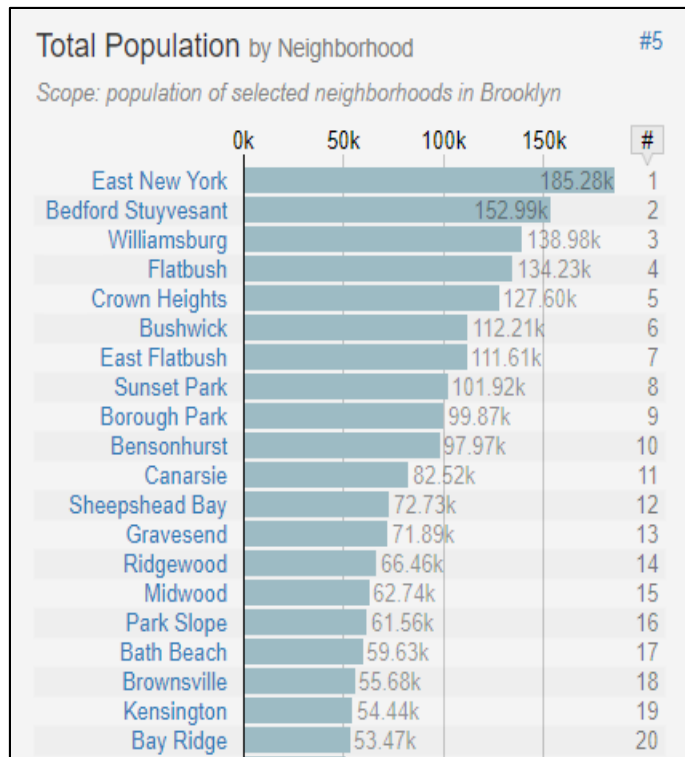
| | Neighborhood | 1st Most Common Venue | 2nd Most Common Venue | 3rd Most Common Venue | 4th Most Common Venue | 5th Most Common Venue | 6th Most Common Venue | 7th Most Common Venue | 8th Most Common Venue | 9th Most Common Venue | 10th Most Common Venue |
|----|--------------------|-----------------------|-----------------------|-----------------------|---------------------------|-----------------------|-----------------------|---------------------------|------------------------|------------------------|-------------------------|
| 0 | Bay Ridge | Pizza Place | Spa | Italian Restaurant | Bagel Shop | Greek Restaurant | American Restaurant | Bar | Pharmacy | Thai Restaurant | Sushi Restaurant |
| 1 | Bensonhurst | Italian Restaurant | Ice Cream Shop | Sushi Restaurant | Chinese Restaurant | Bakery | Donut Shop | Cosmetics Shop | Bagel Shop | Pizza Place | Shabu-Shabu Restaurant |
| 3 | Greenpoint | Bar | Pizza Place | Coffee Shop | Cocktail Bar | Sushi Restaurant | French Restaurant | Mexican Restaurant | Yoga Studio | Grocery Store | New American Restaurant |
| 4 | Gravesend | Pizza Place | Music Venue | Lounge | Bakery | Gym | Spa | Deli / Bodega | Furniture / Home Store | Martial Arts Dojo | Baseball Field |
| 6 | Sheepshead Bay | Dessert Shop | Turkish Restaurant | Sandwich Place | Yoga Studio | Grocery Store | Creperie | Pizza Place | Diner | Restaurant | Russian Restaurant |
| 9 | Crown Heights | Pizza Place | Café | Museum | Bakery | Deli / Bodega | Bagel Shop | Burger Joint | Bus Station | Fried Chicken Joint | Supermarket |
| 11 | Kensington | Grocery Store | Thai Restaurant | Ice Cream Shop | Pizza Place | Bakery | Gas Station | Restaurant | Outdoors & Recreation | Furniture / Home Store | Mexican Restaurant |
| 12 | Windsor Terrace | Park | Plaza | Diner | Grocery Store | Café | Butcher | Chinese Restaurant | Sushi Restaurant | Bookstore | Bakery |
| 13 | Prospect Heights | Bar | Mexican Restaurant | Café | Cocktail Bar | Bakery | Thai Restaurant | Wine Shop | Gourmet Shop | Ice Cream Shop | Japanese Restaurant |
| 15 | Williamsburg | Coffee Shop | Bar | Bagel Shop | Middle Eastern Restaurant | Korean Restaurant | Tapas Restaurant | Latin American Restaurant | Taco Place | Liquor Store | Lounge |
| 16 | Bushwick | Bar | Coffee Shop | Mexican Restaurant | Deli / Bodega | Pizza Place | Discount Store | Bakery | Thrift / Vintage Store | Pet Store | Café |
| 17 | Bedford Stuyvesant | Coffee Shop | Pizza Place | Café | Bar | Juice Bar | Boutique | New American Restaurant | Deli / Bodega | Fried Chicken Joint | Gift Shop |
| 18 | Brooklyn Heights | Yoga Studio | Deli / Bodega | Park | Mexican Restaurant | Italian Restaurant | Gym | Bakery | Juice Bar | Plaza | Pizza Place |
| 19 | Cobble Hill | Bar | Pizza Place | Playground | Coffee Shop | Yoga Studio | Cocktail Bar | Deli / Bodega | Italian Restaurant | French Restaurant | Bookstore |
| 20 | Carroll Gardens | Italian Restaurant | Coffee Shop | Pizza Place | Cocktail Bar | Bakery | Wine Shop | Spa | Bar | Gourmet Shop | Thai Restaurant |

‘Cluster-0’ and ‘Cluster-4’ have similar profile as Vinings. Next we select top neighborhoods based on population from both the clusters

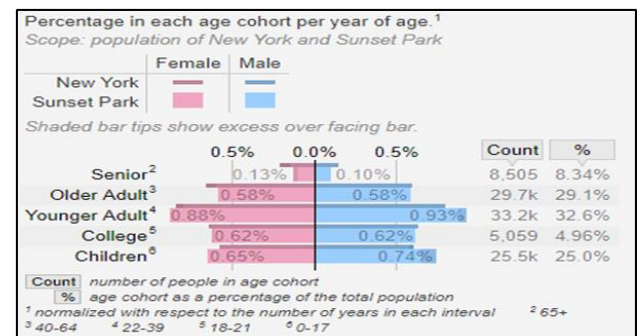
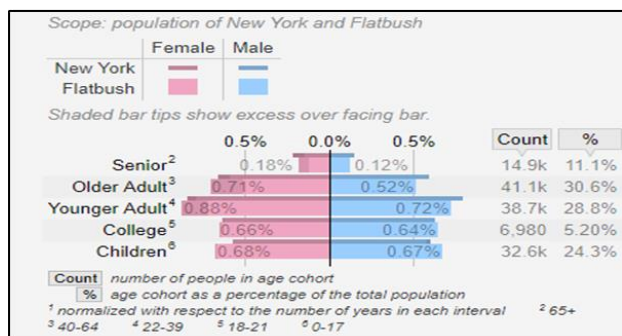
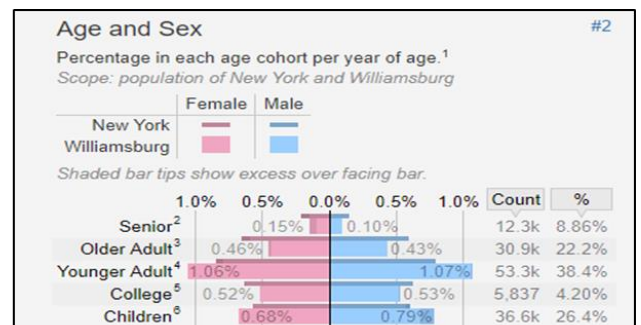
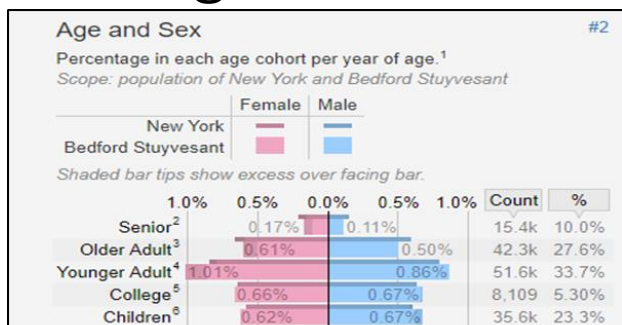
5. Discussion

5.1 Population

- Top Neighborhoods in ‘Cluster-0’ based on population are ‘Sunset Park’ and ‘Flatbush’
- Top Neighborhoods in ‘Cluster-4’ based on population are ‘Bedford Stuyvesant’, ‘Williamsburg’

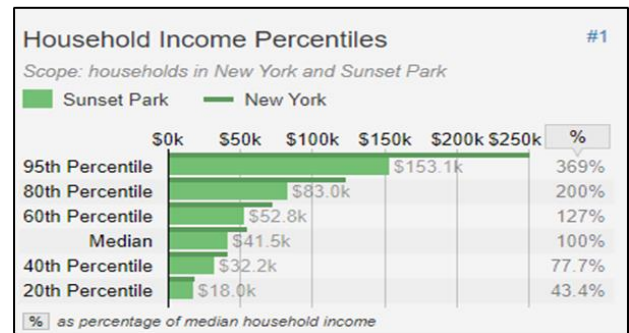
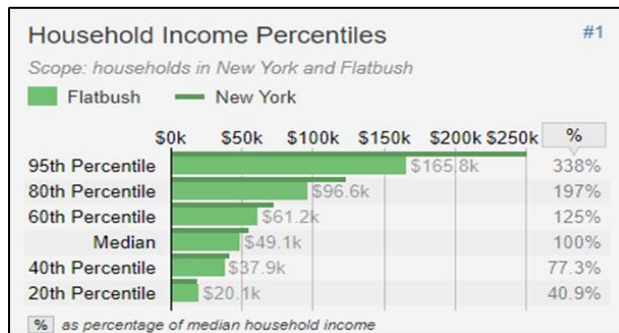
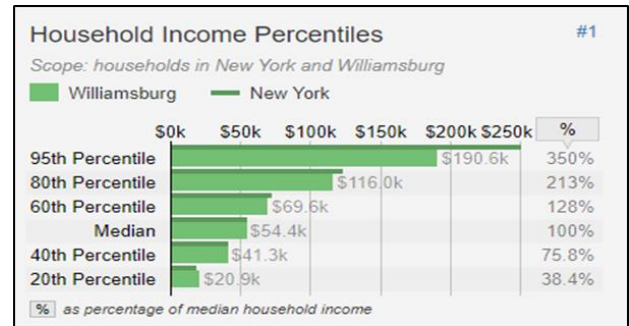
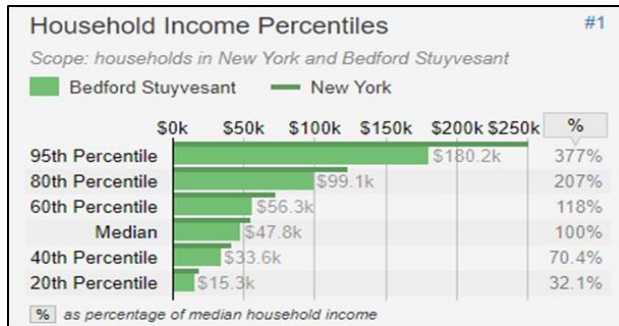


5.2 Age



'Flatbush' and 'Sunset Park' have higher concentration of Older Adults while 'Williamsburg' has a lot of Younger population (32.6%)

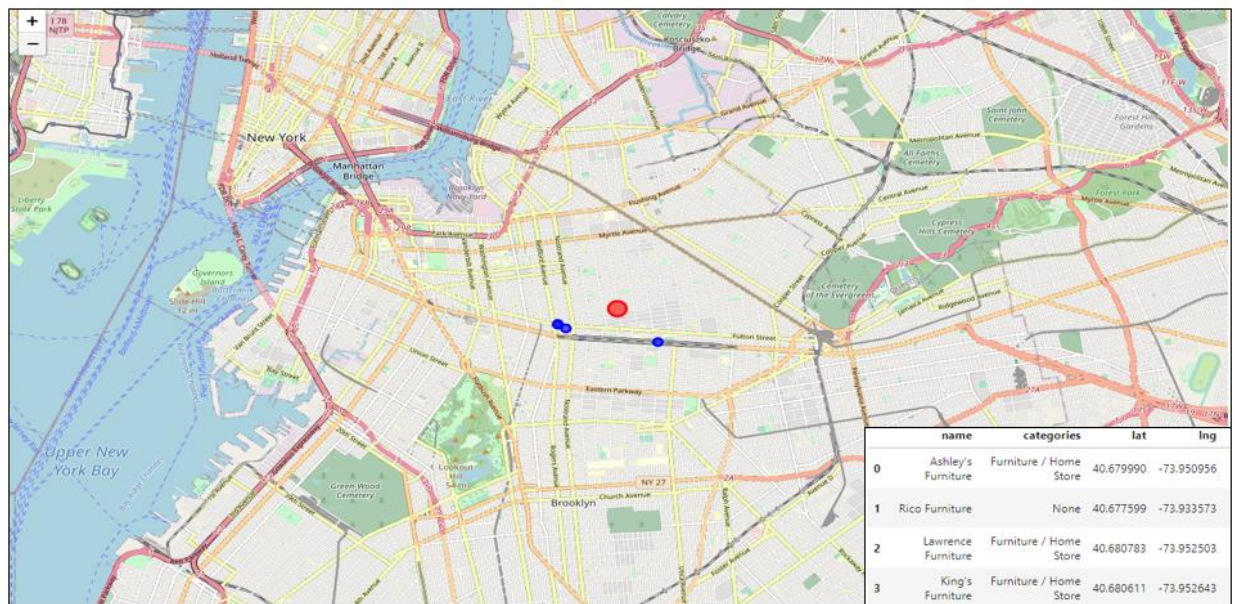
5.3 HH Income



Median Income is highest in 'Williamsburg' at \$54.4k followed by 'Flatbush' at \$49.1k

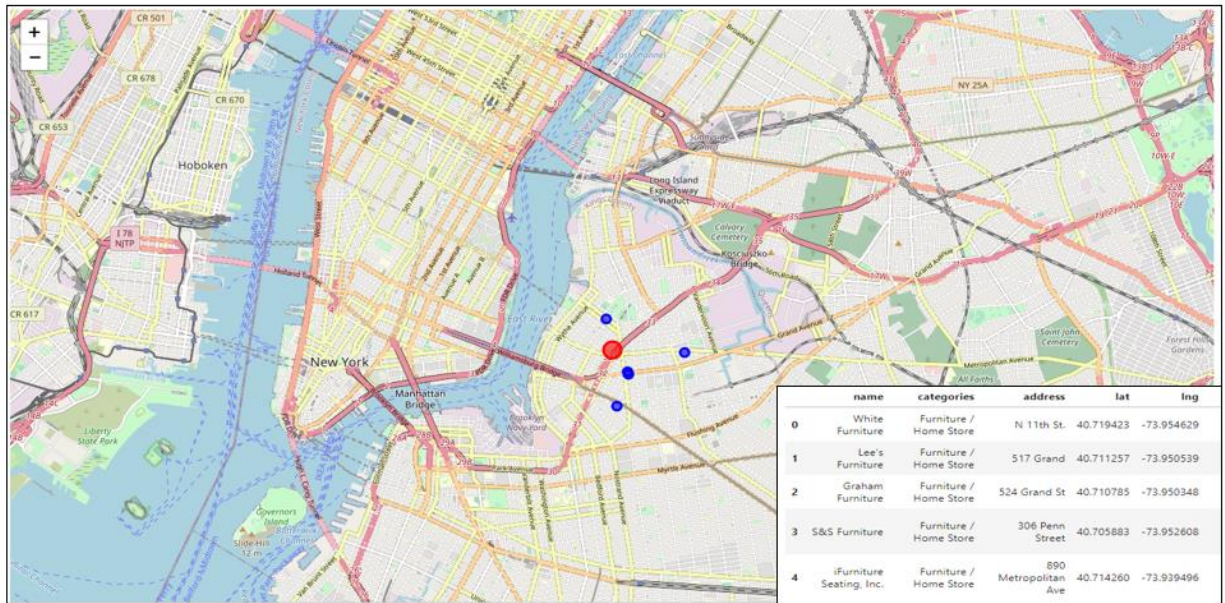
5.4 Competitors

'Bedford Stuyvesant'- Cluster-4



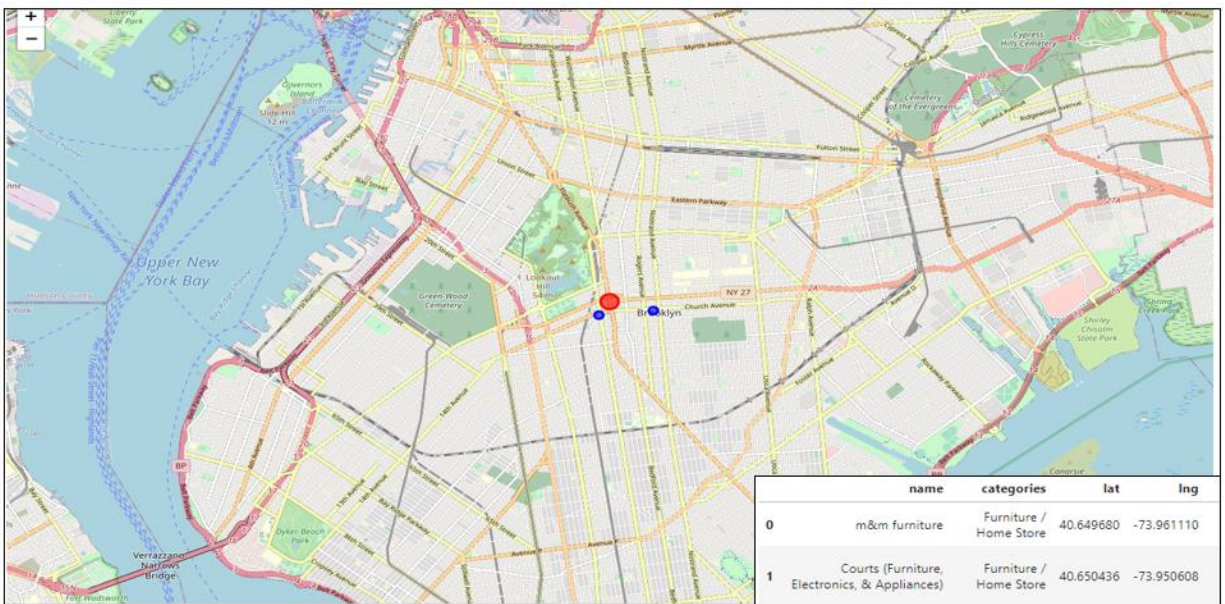
4 Furniture Competitors located within 1000m radius

'Willamsburg'- Cluster-4



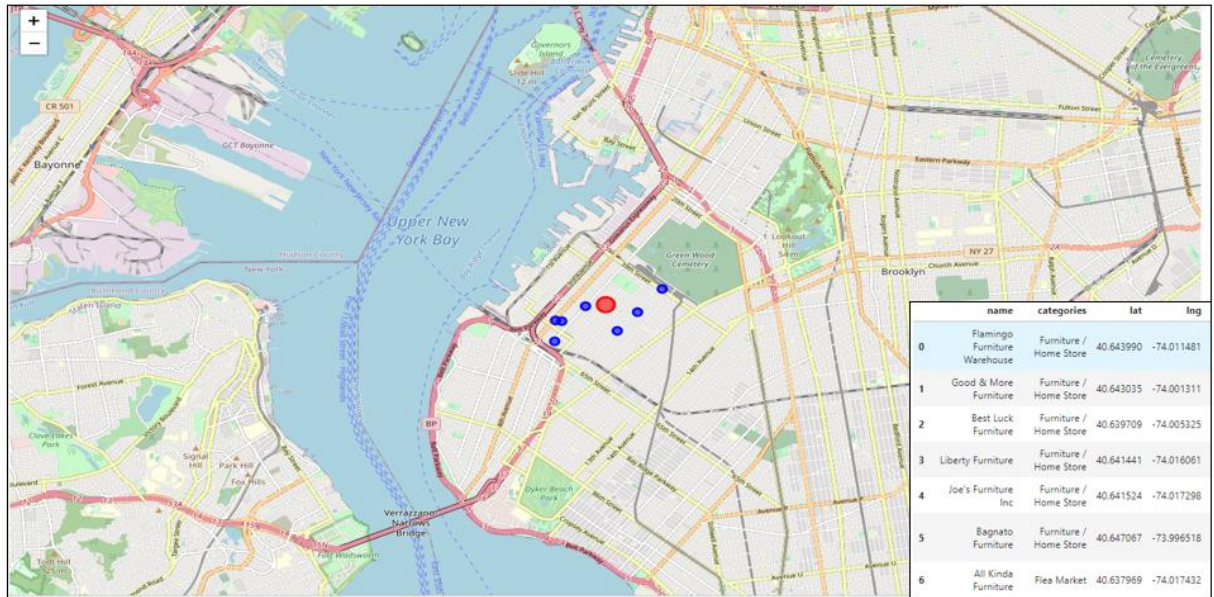
5 Furniture Competitors located within 1000m radius

'Flatbush'- Cluster-0



Only 2 Furniture Competitors located within 1000m radius

'Sunset Park'- Cluster-0



7 Furniture Competitors located within 1000m radius

6. Conclusions

- 'Flatbush' is the best place due to few competitors in vicinity and high population
- Concentration of Older Population and Median HH Incomes are also highest in Flatbush among others making it an ideal market for our Store
- Locations around 'Sunset Park', 'Williamsburg' have significant competitive presence and can hurt our margins if operating in same market
- Analyze Previous Store Closures in the neighborhood
- Carryout more comprehensive analysis of your competitors based on Value Proposition, Products and Target Customers for final site location