```
In [ ]:  #!pip install geopy
         #!pip install geocoder
```

```
In [1]:  import pandas as pd
         import numpy as np
         pd.set_option('display.max_columns', None)
         pd.set_option('display.max_rows', None)
         import requests
         from bs4 import BeautifulSoup
         import geocoder
         import os
         import folium # map rendering library
         from geopy.geocoders import Nominatim # convert an address into latitude and l
         ongitude values
         # Matplotlib and associated plotting modules
         import matplotlib.pyplot as plt
         import matplotlib.cm as cm
         import matplotlib.colors as colors
         %matplotlib inline


         print('Libraries imported.')
```

```
Libraries imported.
```

Now we define a function to get the geocodes i.e latitude and longitude of a given location using geopy.

```
In [2]:  def geo_location(address):
             # get geo location of address
             geolocator = Nominatim(user_agent="ny_explorer")
             location = geolocator.geocode(address)
             latitude = location.latitude
             longitude = location.longitude
             return latitude,longitude
```

We define a function to intract with FourSquare API and get top 100 venues within a radius of 1000 metres for a given latitude and longitude. Below function will return us the venue id , venue name and category.

```
In [3]:  ##client_ID
         ##client_secret
         ##version
         #CLIENT_ID = 'XVEGD2FCXA0AUIZN0LEXEWDPQUSMMHU1DHQLYK1ZTVSKFLCA' # your Foursqu
         are ID
         #CLIENT_SECRET = 'APT3YHYX435I5ETREJSKLYZ51GYXOYPGABRN3UMHHMESLOOS' # your Fou
         rsquare Secret
         #VERSION = '20180605' # Foursquare API version
         #
         # client details from additional account
         CLIENT_ID = 'KW0PYRNOOMLGG21QRWRCIYD44NL4NUZOMRUDZ3TLL3PQLIWP'
         CLIENT_SECRET = 'LS3OJBEQW4I0EEQNYVU1VQNO2FUGNCMWVSVQXQYF5TUVVXMC'
         VERSION = '20180605' # Foursquare API version
```

```
In [4]:  def get_venues(lat,lng):

             #set variables
             radius=1000
             LIMIT=100
         #    CLIENT_ID = os.environ['CLIENT_ID'] # your Foursquare ID
         #    CLIENT_SECRET = os.environ['CLIENT_SECRET'] # your Foursquare Secret
         #    VERSION = '20180605' # Foursquare API version

             #url to fetch data from foursquare api
             url = 'https://api.foursquare.com/v2/venues/explore?&client_id={}&client_s
         ecret={}&v={}&ll={},{}&radius={}&limit={}'.format(
                     CLIENT_ID,
                     CLIENT_SECRET,
                     VERSION,
                     lat,
                     lng,
                     radius,
                     LIMIT)

             # get all the data
             results = requests.get(url).json()
             venue_data=results["response"]['groups'][0]['items']
             venue_details=[]
             for row in venue_data:
                 try:
                     venue_id=row['venue']['id']
                     venue_name=row['venue']['name']
                     venue_category=row['venue']['categories'][0]['name']
                     venue_details.append([venue_id,venue_name,venue_category])
                 except KeyError:
                     pass

             column_names=['ID','Name','Category']
             df = pd.DataFrame(venue_details,columns=column_names)
             return df
```

Now we will define a function to get venue details like like count , rating , tip counts for a given venue id. This will be used for ranking.

```
In [5]:  def get_venue_details(venue_id):

         #   CLIENT_ID = os.environ['CLIENT_ID'] # your Foursquare ID
         #   CLIENT_SECRET = os.environ['CLIENT_SECRET'] # your Foursquare Secret
         #   VERSION = '20180605' # Foursquare API version

             #url to fetch data from foursquare api
             url = 'https://api.foursquare.com/v2/venues/{}?&client_id={}&client_secret
         ={}&v={}'.format(
                     venue_id,
                     CLIENT_ID,
                     CLIENT_SECRET,
                     VERSION)

             # get all the data
             results = requests.get(url).json()
             venue_data=results['response']['venue']
             venue_details=[]
             try:
                 venue_id=venue_data['id']
                 venue_name=venue_data['name']
                 venue_likes=venue_data['likes']['count']
                 venue_rating=venue_data['rating']
                 venue_tips=venue_data['tips']['count']
                 venue_details.append([venue_id,venue_name,venue_likes,venue_rating,ven
         ue_tips])
             except KeyError:
                 pass

             column_names=['ID','Name','Likes','Rating','Tips']
             df = pd.DataFrame(venue_details,columns=column_names)
             return df
```

Now we define a funtion to get the new york city data such as Boroughs, Neighborhoods along with their latitude
and longitude.

```
In [6]:  def get_new_york_data():
             url='https://cocl.us/new_york_dataset'
             resp=requests.get(url).json()
             # all data is present in features label
             features=resp['features']

             # define the dataframe columns
             column_names = ['Borough', 'Neighborhood', 'Latitude', 'Longitude']
             # instantiate the dataframe
             new_york_data = pd.DataFrame(columns=column_names)

             for data in features:
                 borough = data['properties']['borough']
                 neighborhood_name = data['properties']['name']

                 neighborhood_latlon = data['geometry']['coordinates']
                 neighborhood_lat = neighborhood_latlon[1]
                 neighborhood_lon = neighborhood_latlon[0]

                 new_york_data = new_york_data.append({'Borough': borough,
                                                'Neighborhood': neighborhood_name,
                                                'Latitude': neighborhood_lat,
                                                'Longitude': neighborhood_lon}, igno
         re_index=True)

             return new_york_data
```

We will call the above funtion to get the new york city data.

```
In [7]:  # get new york data
         new_york_data=get_new_york_data()
```

```
In [8]:  new_york_data.head()
```

Out[8]:

|   | Borough | Neighborhood | Latitude | Longitude |
|---|---------|--------------|----------|-----------|
| 0 | Bronx | Wakefield | 40.894705 | -73.847201 |
| 1 | Bronx | Co-op City | 40.874294 | -73.829939 |
| 2 | Bronx | Eastchester | 40.887556 | -73.827806 |
| 3 | Bronx | Fieldston | 40.895437 | -73.905643 |
| 4 | Bronx | Riverdale | 40.890834 | -73.912585 |

```
In [9]:  new_york_data.shape
```

Out[9]:  (306, 4)

So there are total of 306 different Neighborhoods in New York

In [10]:
```python
plt.figure(figsize=(9,5), dpi = 100)
# title
plt.title('Number of Neighborhood for each Borough in New York City')
#On x-axis
plt.xlabel('Borough', fontsize = 15)
#On y-axis
plt.ylabel('No.of Neighborhood', fontsize=15)
#giving a bar plot
new_york_data.groupby('Borough')['Neighborhood'].count().plot(kind='bar')
#Legend
plt.legend()
#displays the plot
plt.show()
```
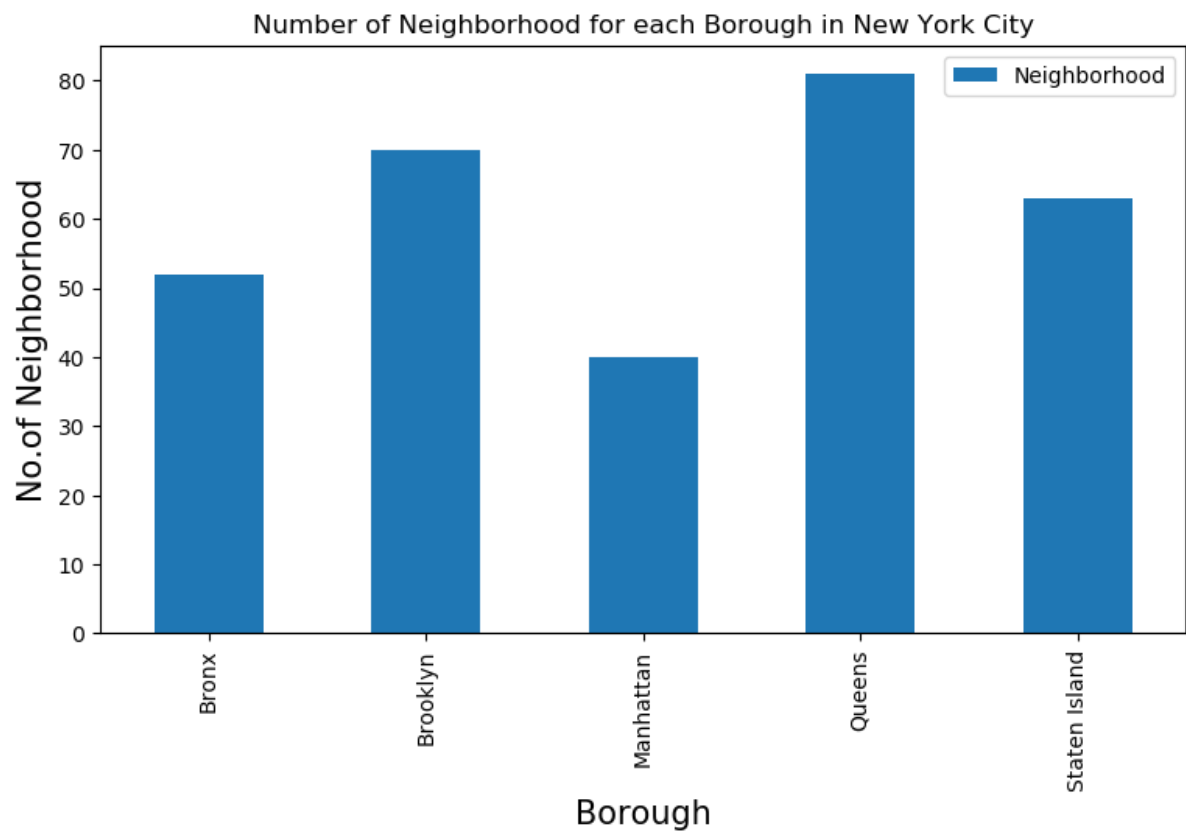


We see that Queens has highest number of neighborhoods

Now we will collect Korean resturants for each Neighborhood

In [11]:
```python
# prepare neighborhood list that contains korean resturants
column_names=['Borough', 'Neighborhood', 'ID','Name']
korean_rest_ny=pd.DataFrame(columns=column_names)
count=1
for row in new_york_data.values.tolist():
    Borough, Neighborhood, Latitude, Longitude=row
    venues = get_venues(Latitude,Longitude)
    korean_resturants=venues[venues['Category']=='Korean Restaurant']
    print('(',count,'/',len(new_york_data),')','Korean Resturants in '+Neighbo
rhood+', '+Borough+':'+str(len(korean_resturants)))
    for resturant_detail in korean_resturants.values.tolist():
        id, name , category=resturant_detail
        korean_rest_ny = korean_rest_ny.append({'Borough': Borough,
                                                'Neighborhood': Neighborhood,
                                                'ID': id,
                                                'Name' : name
                                               }, ignore_index=True)
    count+=1
```

```
( 1 / 306 ) Korean Resturants in Wakefield, Bronx:0
( 2 / 306 ) Korean Resturants in Co-op City, Bronx:0
( 3 / 306 ) Korean Resturants in Eastchester, Bronx:0
( 4 / 306 ) Korean Resturants in Fieldston, Bronx:0
( 5 / 306 ) Korean Resturants in Riverdale, Bronx:0
( 6 / 306 ) Korean Resturants in Kingsbridge, Bronx:0
( 7 / 306 ) Korean Resturants in Marble Hill, Manhattan:0
( 8 / 306 ) Korean Resturants in Woodlawn, Bronx:0
( 9 / 306 ) Korean Resturants in Norwood, Bronx:0
( 10 / 306 ) Korean Resturants in Williamsbridge, Bronx:0
( 11 / 306 ) Korean Resturants in Baychester, Bronx:0
( 12 / 306 ) Korean Resturants in Pelham Parkway, Bronx:0
( 13 / 306 ) Korean Resturants in City Island, Bronx:0
( 14 / 306 ) Korean Resturants in Bedford Park, Bronx:0
( 15 / 306 ) Korean Resturants in University Heights, Bronx:0
( 16 / 306 ) Korean Resturants in Morris Heights, Bronx:0
( 17 / 306 ) Korean Resturants in Fordham, Bronx:0
( 18 / 306 ) Korean Resturants in East Tremont, Bronx:0
( 19 / 306 ) Korean Resturants in West Farms, Bronx:0
( 20 / 306 ) Korean Resturants in High  Bridge, Bronx:0
( 21 / 306 ) Korean Resturants in Melrose, Bronx:0
( 22 / 306 ) Korean Resturants in Mott Haven, Bronx:0
( 23 / 306 ) Korean Resturants in Port Morris, Bronx:0
( 24 / 306 ) Korean Resturants in Longwood, Bronx:0
( 25 / 306 ) Korean Resturants in Hunts Point, Bronx:0
( 26 / 306 ) Korean Resturants in Morrisania, Bronx:0
( 27 / 306 ) Korean Resturants in Soundview, Bronx:0
( 28 / 306 ) Korean Resturants in Clason Point, Bronx:0
( 29 / 306 ) Korean Resturants in Throgs Neck, Bronx:0
( 30 / 306 ) Korean Resturants in Country Club, Bronx:0
( 31 / 306 ) Korean Resturants in Parkchester, Bronx:0
( 32 / 306 ) Korean Resturants in Westchester Square, Bronx:0
( 33 / 306 ) Korean Resturants in Van Nest, Bronx:0
( 34 / 306 ) Korean Resturants in Morris Park, Bronx:0
( 35 / 306 ) Korean Resturants in Belmont, Bronx:0
( 36 / 306 ) Korean Resturants in Spuyten Duyvil, Bronx:0
( 37 / 306 ) Korean Resturants in North Riverdale, Bronx:0
( 38 / 306 ) Korean Resturants in Pelham Bay, Bronx:0
( 39 / 306 ) Korean Resturants in Schuylerville, Bronx:0
( 40 / 306 ) Korean Resturants in Edgewater Park, Bronx:0
( 41 / 306 ) Korean Resturants in Castle Hill, Bronx:0
( 42 / 306 ) Korean Resturants in Olinville, Bronx:0
( 43 / 306 ) Korean Resturants in Pelham Gardens, Bronx:0
( 44 / 306 ) Korean Resturants in Concourse, Bronx:0
( 45 / 306 ) Korean Resturants in Unionport, Bronx:0
( 46 / 306 ) Korean Resturants in Edenwald, Bronx:0
( 47 / 306 ) Korean Resturants in Bay Ridge, Brooklyn:0
( 48 / 306 ) Korean Resturants in Bensonhurst, Brooklyn:1
( 49 / 306 ) Korean Resturants in Sunset Park, Brooklyn:0
( 50 / 306 ) Korean Resturants in Greenpoint, Brooklyn:0
( 51 / 306 ) Korean Resturants in Gravesend, Brooklyn:0
( 52 / 306 ) Korean Resturants in Brighton Beach, Brooklyn:1
( 53 / 306 ) Korean Resturants in Sheepshead Bay, Brooklyn:0
( 54 / 306 ) Korean Resturants in Manhattan Terrace, Brooklyn:0
( 55 / 306 ) Korean Resturants in Flatbush, Brooklyn:0
( 56 / 306 ) Korean Resturants in Crown Heights, Brooklyn:0
( 57 / 306 ) Korean Resturants in East Flatbush, Brooklyn:0
```

```
( 58 / 306 ) Korean Resturants in Kensington, Brooklyn:0
( 59 / 306 ) Korean Resturants in Windsor Terrace, Brooklyn:0
( 60 / 306 ) Korean Resturants in Prospect Heights, Brooklyn:1
( 61 / 306 ) Korean Resturants in Brownsville, Brooklyn:0
( 62 / 306 ) Korean Resturants in Williamsburg, Brooklyn:1
( 63 / 306 ) Korean Resturants in Bushwick, Brooklyn:0
( 64 / 306 ) Korean Resturants in Bedford Stuyvesant, Brooklyn:0
( 65 / 306 ) Korean Resturants in Brooklyn Heights, Brooklyn:0
( 66 / 306 ) Korean Resturants in Cobble Hill, Brooklyn:0
( 67 / 306 ) Korean Resturants in Carroll Gardens, Brooklyn:0
( 68 / 306 ) Korean Resturants in Red Hook, Brooklyn:0
( 69 / 306 ) Korean Resturants in Gowanus, Brooklyn:0
( 70 / 306 ) Korean Resturants in Fort Greene, Brooklyn:0
( 71 / 306 ) Korean Resturants in Park Slope, Brooklyn:1
( 72 / 306 ) Korean Resturants in Cypress Hills, Brooklyn:0
( 73 / 306 ) Korean Resturants in East New York, Brooklyn:0
( 74 / 306 ) Korean Resturants in Starrett City, Brooklyn:0
( 75 / 306 ) Korean Resturants in Canarsie, Brooklyn:0
( 76 / 306 ) Korean Resturants in Flatlands, Brooklyn:0
( 77 / 306 ) Korean Resturants in Mill Island, Brooklyn:0
( 78 / 306 ) Korean Resturants in Manhattan Beach, Brooklyn:0
( 79 / 306 ) Korean Resturants in Coney Island, Brooklyn:0
( 80 / 306 ) Korean Resturants in Bath Beach, Brooklyn:0
( 81 / 306 ) Korean Resturants in Borough Park, Brooklyn:0
( 82 / 306 ) Korean Resturants in Dyker Heights, Brooklyn:0
( 83 / 306 ) Korean Resturants in Gerritsen Beach, Brooklyn:0
( 84 / 306 ) Korean Resturants in Marine Park, Brooklyn:0
( 85 / 306 ) Korean Resturants in Clinton Hill, Brooklyn:0
( 86 / 306 ) Korean Resturants in Sea Gate, Brooklyn:0
( 87 / 306 ) Korean Resturants in Downtown, Brooklyn:0
( 88 / 306 ) Korean Resturants in Boerum Hill, Brooklyn:0
( 89 / 306 ) Korean Resturants in Prospect Lefferts Gardens, Brooklyn:1
( 90 / 306 ) Korean Resturants in Ocean Hill, Brooklyn:0
( 91 / 306 ) Korean Resturants in City Line, Brooklyn:0
( 92 / 306 ) Korean Resturants in Bergen Beach, Brooklyn:0
( 93 / 306 ) Korean Resturants in Midwood, Brooklyn:0
( 94 / 306 ) Korean Resturants in Prospect Park South, Brooklyn:0
( 95 / 306 ) Korean Resturants in Georgetown, Brooklyn:0
( 96 / 306 ) Korean Resturants in East Williamsburg, Brooklyn:0
( 97 / 306 ) Korean Resturants in North Side, Brooklyn:0
( 98 / 306 ) Korean Resturants in South Side, Brooklyn:1
( 99 / 306 ) Korean Resturants in Ocean Parkway, Brooklyn:0
( 100 / 306 ) Korean Resturants in Fort Hamilton, Brooklyn:0
( 101 / 306 ) Korean Resturants in Chinatown, Manhattan:0
( 102 / 306 ) Korean Resturants in Washington Heights, Manhattan:0
( 103 / 306 ) Korean Resturants in Inwood, Manhattan:0
( 104 / 306 ) Korean Resturants in Hamilton Heights, Manhattan:0
( 105 / 306 ) Korean Resturants in Manhattanville, Manhattan:0
( 106 / 306 ) Korean Resturants in Central Harlem, Manhattan:0
( 107 / 306 ) Korean Resturants in East Harlem, Manhattan:0
( 108 / 306 ) Korean Resturants in Upper East Side, Manhattan:0
( 109 / 306 ) Korean Resturants in Yorkville, Manhattan:0
( 110 / 306 ) Korean Resturants in Lenox Hill, Manhattan:0
( 111 / 306 ) Korean Resturants in Roosevelt Island, Manhattan:0
( 112 / 306 ) Korean Resturants in Upper West Side, Manhattan:0
( 113 / 306 ) Korean Resturants in Lincoln Square, Manhattan:0
( 114 / 306 ) Korean Resturants in Clinton, Manhattan:0
```

```
( 115 / 306 ) Korean Resturants in Midtown, Manhattan:0
( 116 / 306 ) Korean Resturants in Murray Hill, Manhattan:5
( 117 / 306 ) Korean Resturants in Chelsea, Manhattan:0
( 118 / 306 ) Korean Resturants in Greenwich Village, Manhattan:0
( 119 / 306 ) Korean Resturants in East Village, Manhattan:2
( 120 / 306 ) Korean Resturants in Lower East Side, Manhattan:0
( 121 / 306 ) Korean Resturants in Tribeca, Manhattan:1
( 122 / 306 ) Korean Resturants in Little Italy, Manhattan:0
( 123 / 306 ) Korean Resturants in Soho, Manhattan:0
( 124 / 306 ) Korean Resturants in West Village, Manhattan:0
( 125 / 306 ) Korean Resturants in Manhattan Valley, Manhattan:1
( 126 / 306 ) Korean Resturants in Morningside Heights, Manhattan:0
( 127 / 306 ) Korean Resturants in Gramercy, Manhattan:0
( 128 / 306 ) Korean Resturants in Battery Park City, Manhattan:0
( 129 / 306 ) Korean Resturants in Financial District, Manhattan:0
( 130 / 306 ) Korean Resturants in Astoria, Queens:1
( 131 / 306 ) Korean Resturants in Woodside, Queens:1
( 132 / 306 ) Korean Resturants in Jackson Heights, Queens:1
( 133 / 306 ) Korean Resturants in Elmhurst, Queens:1
( 134 / 306 ) Korean Resturants in Howard Beach, Queens:0
( 135 / 306 ) Korean Resturants in Corona, Queens:0
( 136 / 306 ) Korean Resturants in Forest Hills, Queens:0
( 137 / 306 ) Korean Resturants in Kew Gardens, Queens:0
( 138 / 306 ) Korean Resturants in Richmond Hill, Queens:0
( 139 / 306 ) Korean Resturants in Flushing, Queens:7
( 140 / 306 ) Korean Resturants in Long Island City, Queens:0
( 141 / 306 ) Korean Resturants in Sunnyside, Queens:2
( 142 / 306 ) Korean Resturants in East Elmhurst, Queens:0
( 143 / 306 ) Korean Resturants in Maspeth, Queens:0
( 144 / 306 ) Korean Resturants in Ridgewood, Queens:0
( 145 / 306 ) Korean Resturants in Glendale, Queens:0
( 146 / 306 ) Korean Resturants in Rego Park, Queens:0
( 147 / 306 ) Korean Resturants in Woodhaven, Queens:0
( 148 / 306 ) Korean Resturants in Ozone Park, Queens:0
( 149 / 306 ) Korean Resturants in South Ozone Park, Queens:0
( 150 / 306 ) Korean Resturants in College Point, Queens:1
( 151 / 306 ) Korean Resturants in Whitestone, Queens:0
( 152 / 306 ) Korean Resturants in Bayside, Queens:2
( 153 / 306 ) Korean Resturants in Auburndale, Queens:14
( 154 / 306 ) Korean Resturants in Little Neck, Queens:4
( 155 / 306 ) Korean Resturants in Douglaston, Queens:4
( 156 / 306 ) Korean Resturants in Glen Oaks, Queens:0
( 157 / 306 ) Korean Resturants in Bellerose, Queens:0
( 158 / 306 ) Korean Resturants in Kew Gardens Hills, Queens:0
( 159 / 306 ) Korean Resturants in Fresh Meadows, Queens:0
( 160 / 306 ) Korean Resturants in Briarwood, Queens:0
( 161 / 306 ) Korean Resturants in Jamaica Center, Queens:0
( 162 / 306 ) Korean Resturants in Oakland Gardens, Queens:5
( 163 / 306 ) Korean Resturants in Queens Village, Queens:0
( 164 / 306 ) Korean Resturants in Hollis, Queens:0
( 165 / 306 ) Korean Resturants in South Jamaica, Queens:0
( 166 / 306 ) Korean Resturants in St. Albans, Queens:0
( 167 / 306 ) Korean Resturants in Rochdale, Queens:0
( 168 / 306 ) Korean Resturants in Springfield Gardens, Queens:0
( 169 / 306 ) Korean Resturants in Cambria Heights, Queens:0
( 170 / 306 ) Korean Resturants in Rosedale, Queens:0
( 171 / 306 ) Korean Resturants in Far Rockaway, Queens:0
```

```
( 172 / 306 ) Korean Resturants in Broad Channel, Queens:0
( 173 / 306 ) Korean Resturants in Breezy Point, Queens:0
( 174 / 306 ) Korean Resturants in Steinway, Queens:0
( 175 / 306 ) Korean Resturants in Beechhurst, Queens:0
( 176 / 306 ) Korean Resturants in Bay Terrace, Queens:0
( 177 / 306 ) Korean Resturants in Edgemere, Queens:0
( 178 / 306 ) Korean Resturants in Arverne, Queens:0
( 179 / 306 ) Korean Resturants in Rockaway Beach, Queens:0
( 180 / 306 ) Korean Resturants in Neponsit, Queens:0
( 181 / 306 ) Korean Resturants in Murray Hill, Queens:36
( 182 / 306 ) Korean Resturants in Floral Park, Queens:0
( 183 / 306 ) Korean Resturants in Holliswood, Queens:0
( 184 / 306 ) Korean Resturants in Jamaica Estates, Queens:0
( 185 / 306 ) Korean Resturants in Queensboro Hill, Queens:0
( 186 / 306 ) Korean Resturants in Hillcrest, Queens:1
( 187 / 306 ) Korean Resturants in Ravenswood, Queens:1
( 188 / 306 ) Korean Resturants in Lindenwood, Queens:0
( 189 / 306 ) Korean Resturants in Laurelton, Queens:0
( 190 / 306 ) Korean Resturants in Lefrak City, Queens:0
( 191 / 306 ) Korean Resturants in Belle Harbor, Queens:0
( 192 / 306 ) Korean Resturants in Rockaway Park, Queens:0
( 193 / 306 ) Korean Resturants in Somerville, Queens:0
( 194 / 306 ) Korean Resturants in Brookville, Queens:0
( 195 / 306 ) Korean Resturants in Bellaire, Queens:0
( 196 / 306 ) Korean Resturants in North Corona, Queens:0
( 197 / 306 ) Korean Resturants in Forest Hills Gardens, Queens:0
( 198 / 306 ) Korean Resturants in St. George, Staten Island:0
( 199 / 306 ) Korean Resturants in New Brighton, Staten Island:0
( 200 / 306 ) Korean Resturants in Stapleton, Staten Island:0
( 201 / 306 ) Korean Resturants in Rosebank, Staten Island:0
( 202 / 306 ) Korean Resturants in West Brighton, Staten Island:0
( 203 / 306 ) Korean Resturants in Grymes Hill, Staten Island:0
( 204 / 306 ) Korean Resturants in Todt Hill, Staten Island:0
( 205 / 306 ) Korean Resturants in South Beach, Staten Island:0
( 206 / 306 ) Korean Resturants in Port Richmond, Staten Island:0
( 207 / 306 ) Korean Resturants in Mariner's Harbor, Staten Island:0
( 208 / 306 ) Korean Resturants in Port Ivory, Staten Island:0
( 209 / 306 ) Korean Resturants in Castleton Corners, Staten Island:0
( 210 / 306 ) Korean Resturants in New Springville, Staten Island:0
( 211 / 306 ) Korean Resturants in Travis, Staten Island:0
( 212 / 306 ) Korean Resturants in New Dorp, Staten Island:0
( 213 / 306 ) Korean Resturants in Oakwood, Staten Island:0
( 214 / 306 ) Korean Resturants in Great Kills, Staten Island:0
( 215 / 306 ) Korean Resturants in Eltingville, Staten Island:0
( 216 / 306 ) Korean Resturants in Annadale, Staten Island:0
( 217 / 306 ) Korean Resturants in Woodrow, Staten Island:0
( 218 / 306 ) Korean Resturants in Tottenville, Staten Island:0
( 219 / 306 ) Korean Resturants in Tompkinsville, Staten Island:0
( 220 / 306 ) Korean Resturants in Silver Lake, Staten Island:0
( 221 / 306 ) Korean Resturants in Sunnyside, Staten Island:0
( 222 / 306 ) Korean Resturants in Ditmas Park, Brooklyn:0
( 223 / 306 ) Korean Resturants in Wingate, Brooklyn:0
( 224 / 306 ) Korean Resturants in Rugby, Brooklyn:0
( 225 / 306 ) Korean Resturants in Park Hill, Staten Island:0
( 226 / 306 ) Korean Resturants in Westerleigh, Staten Island:0
( 227 / 306 ) Korean Resturants in Graniteville, Staten Island:0
( 228 / 306 ) Korean Resturants in Arlington, Staten Island:0
```

```
( 229 / 306 ) Korean Resturants in Arrochar, Staten Island:0
( 230 / 306 ) Korean Resturants in Grasmere, Staten Island:0
( 231 / 306 ) Korean Resturants in Old Town, Staten Island:0
( 232 / 306 ) Korean Resturants in Dongan Hills, Staten Island:0
( 233 / 306 ) Korean Resturants in Midland Beach, Staten Island:0
( 234 / 306 ) Korean Resturants in Grant City, Staten Island:0
( 235 / 306 ) Korean Resturants in New Dorp Beach, Staten Island:0
( 236 / 306 ) Korean Resturants in Bay Terrace, Staten Island:0
( 237 / 306 ) Korean Resturants in Huguenot, Staten Island:0
( 238 / 306 ) Korean Resturants in Pleasant Plains, Staten Island:0
( 239 / 306 ) Korean Resturants in Butler Manor, Staten Island:0
( 240 / 306 ) Korean Resturants in Charleston, Staten Island:0
( 241 / 306 ) Korean Resturants in Rossville, Staten Island:0
( 242 / 306 ) Korean Resturants in Arden Heights, Staten Island:0
( 243 / 306 ) Korean Resturants in Greenridge, Staten Island:0
( 244 / 306 ) Korean Resturants in Heartland Village, Staten Island:0
( 245 / 306 ) Korean Resturants in Chelsea, Staten Island:0
( 246 / 306 ) Korean Resturants in Bloomfield, Staten Island:0
( 247 / 306 ) Korean Resturants in Bulls Head, Staten Island:0
( 248 / 306 ) Korean Resturants in Carnegie Hill, Manhattan:0
( 249 / 306 ) Korean Resturants in Noho, Manhattan:1
( 250 / 306 ) Korean Resturants in Civic Center, Manhattan:1
( 251 / 306 ) Korean Resturants in Midtown South, Manhattan:9
( 252 / 306 ) Korean Resturants in Richmond Town, Staten Island:0
( 253 / 306 ) Korean Resturants in Shore Acres, Staten Island:0
( 254 / 306 ) Korean Resturants in Clifton, Staten Island:0
( 255 / 306 ) Korean Resturants in Concord, Staten Island:0
( 256 / 306 ) Korean Resturants in Emerson Hill, Staten Island:0
( 257 / 306 ) Korean Resturants in Randall Manor, Staten Island:0
( 258 / 306 ) Korean Resturants in Howland Hook, Staten Island:0
( 259 / 306 ) Korean Resturants in Elm Park, Staten Island:0
( 260 / 306 ) Korean Resturants in Remsen Village, Brooklyn:0
( 261 / 306 ) Korean Resturants in New Lots, Brooklyn:0
( 262 / 306 ) Korean Resturants in Paerdegat Basin, Brooklyn:0
( 263 / 306 ) Korean Resturants in Mill Basin, Brooklyn:0
( 264 / 306 ) Korean Resturants in Jamaica Hills, Queens:0
( 265 / 306 ) Korean Resturants in Utopia, Queens:1
( 266 / 306 ) Korean Resturants in Pomonok, Queens:1
( 267 / 306 ) Korean Resturants in Astoria Heights, Queens:0
( 268 / 306 ) Korean Resturants in Claremont Village, Bronx:0
( 269 / 306 ) Korean Resturants in Concourse Village, Bronx:0
( 270 / 306 ) Korean Resturants in Mount Eden, Bronx:0
( 271 / 306 ) Korean Resturants in Mount Hope, Bronx:0
( 272 / 306 ) Korean Resturants in Sutton Place, Manhattan:0
( 273 / 306 ) Korean Resturants in Hunters Point, Queens:0
( 274 / 306 ) Korean Resturants in Turtle Bay, Manhattan:0
( 275 / 306 ) Korean Resturants in Tudor City, Manhattan:0
( 276 / 306 ) Korean Resturants in Stuyvesant Town, Manhattan:1
( 277 / 306 ) Korean Resturants in Flatiron, Manhattan:0
( 278 / 306 ) Korean Resturants in Sunnyside Gardens, Queens:3
( 279 / 306 ) Korean Resturants in Blissville, Queens:0
( 280 / 306 ) Korean Resturants in Fulton Ferry, Brooklyn:0
( 281 / 306 ) Korean Resturants in Vinegar Hill, Brooklyn:0
( 282 / 306 ) Korean Resturants in Weeksville, Brooklyn:0
( 283 / 306 ) Korean Resturants in Broadway Junction, Brooklyn:0
( 284 / 306 ) Korean Resturants in Dumbo, Brooklyn:0
( 285 / 306 ) Korean Resturants in Manor Heights, Staten Island:0
```

```
( 286 / 306 ) Korean Resturants in Willowbrook, Staten Island:0
( 287 / 306 ) Korean Resturants in Sandy Ground, Staten Island:0
( 288 / 306 ) Korean Resturants in Egbertville, Staten Island:0
( 289 / 306 ) Korean Resturants in Roxbury, Queens:0
( 290 / 306 ) Korean Resturants in Homecrest, Brooklyn:0
( 291 / 306 ) Korean Resturants in Middle Village, Queens:0
( 292 / 306 ) Korean Resturants in Prince's Bay, Staten Island:0
( 293 / 306 ) Korean Resturants in Lighthouse Hill, Staten Island:0
( 294 / 306 ) Korean Resturants in Richmond Valley, Staten Island:0
( 295 / 306 ) Korean Resturants in Malba, Queens:1
( 296 / 306 ) Korean Resturants in Highland Park, Brooklyn:0
( 297 / 306 ) Korean Resturants in Madison, Brooklyn:0
( 298 / 306 ) Korean Resturants in Bronxdale, Bronx:0
( 299 / 306 ) Korean Resturants in Allerton, Bronx:0
( 300 / 306 ) Korean Resturants in Kingsbridge Heights, Bronx:0
( 301 / 306 ) Korean Resturants in Erasmus, Brooklyn:0
( 302 / 306 ) Korean Resturants in Hudson Yards, Manhattan:0
( 303 / 306 ) Korean Resturants in Hammels, Queens:0
( 304 / 306 ) Korean Resturants in Bayswater, Queens:0
( 305 / 306 ) Korean Resturants in Queensbridge, Queens:0
( 306 / 306 ) Korean Resturants in Fox Hills, Staten Island:0
```

Now that we have got all the korean resturants in new york city , we will analyze it

In [12]: `korean_rest_ny.head()`

Out[12]:

|   | Borough | Neighborhood | ID | Name |
|---|---------|--------------|-----|------|
| 0 | Brooklyn | Bensonhurst | 57049cb4498efcebf6578c1b | Cafe Lily |
| 1 | Brooklyn | Brighton Beach | 4c9d5c0303133704a96f5ed5 | Cafe At Your Mother-in-Law |
| 2 | Brooklyn | Prospect Heights | 4fa162e0e4b0badc81404a51 | Kimchi Grill |
| 3 | Brooklyn | Williamsburg | 52bf3053498e754b09a440b5 | Dotory |
| 4 | Brooklyn | Park Slope | 5bba42ff7dc9e1002cd1a1df | Haenyeo |

In [13]: `korean_rest_ny.shape`

Out[13]: `(115, 4)`

*We got 115 Korean Resturants across New York City*

```
In [14]: plt.figure(figsize=(9,5), dpi = 100)
         # title
         plt.title('Number of Korean Resturants for each Borough in New York City')
         #On x-axis
         plt.xlabel('Borough', fontsize = 15)
         #On y-axis
         plt.ylabel('No.of Korean Resturants', fontsize=15)
         #giving a bar plot
         korean_rest_ny.groupby('Borough')['ID'].count().plot(kind='bar')
         #Legend
         plt.legend()
         #displays the plot
         plt.show()
```

Number of Korean Resturants for each Borough in New York City
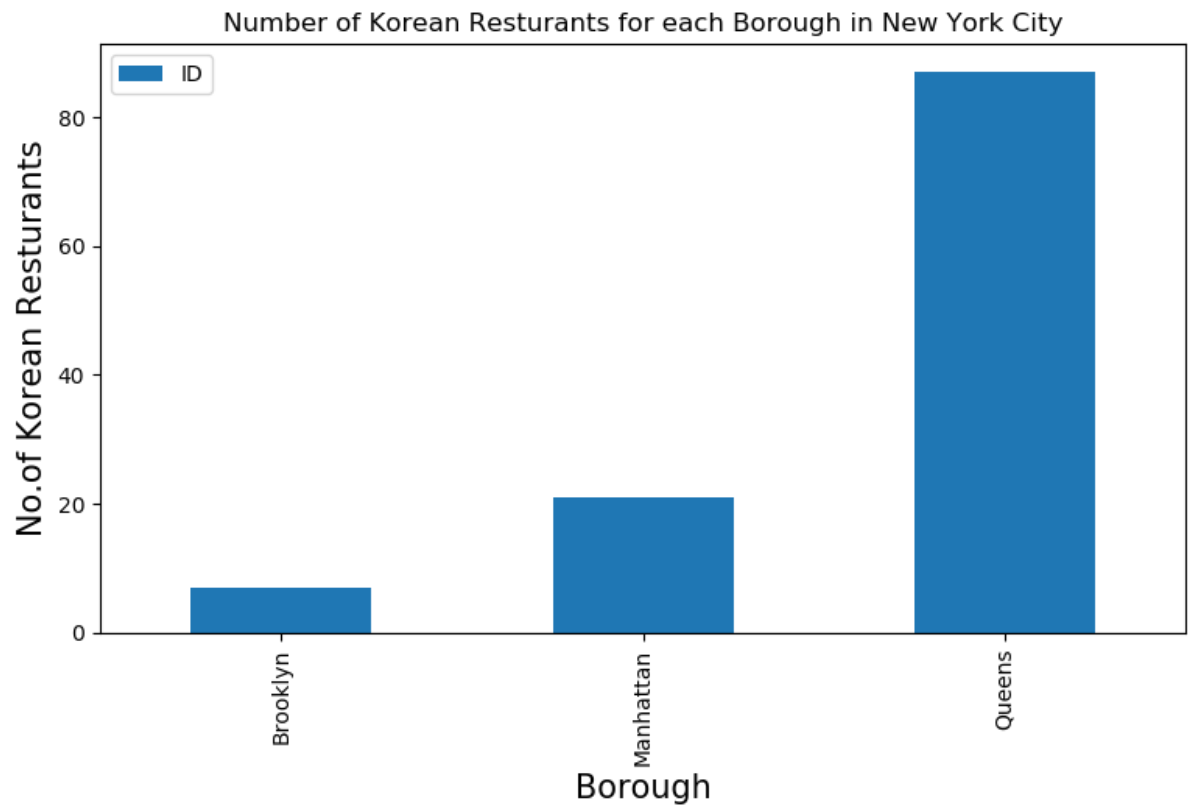
We see that Queens has the largest number of korean resturants

In [15]:
```python
plt.figure(figsize=(9,5), dpi = 100)
# title
plt.title('Number of Korean Resturants for each Neighborhood in New York City'
)
#On x-axis
plt.xlabel('Neighborhood', fontsize = 15)
#On y-axis
plt.ylabel('No.of Korean Resturants', fontsize=15)
#giving a bar plot
korean_rest_ny.groupby('Neighborhood')['ID'].count().nlargest(5).plot(kind='ba
r')
#Legend
plt.legend()
#displays the plot
plt.show()
```

Number of Korean Resturants for each Neighborhood in New York City
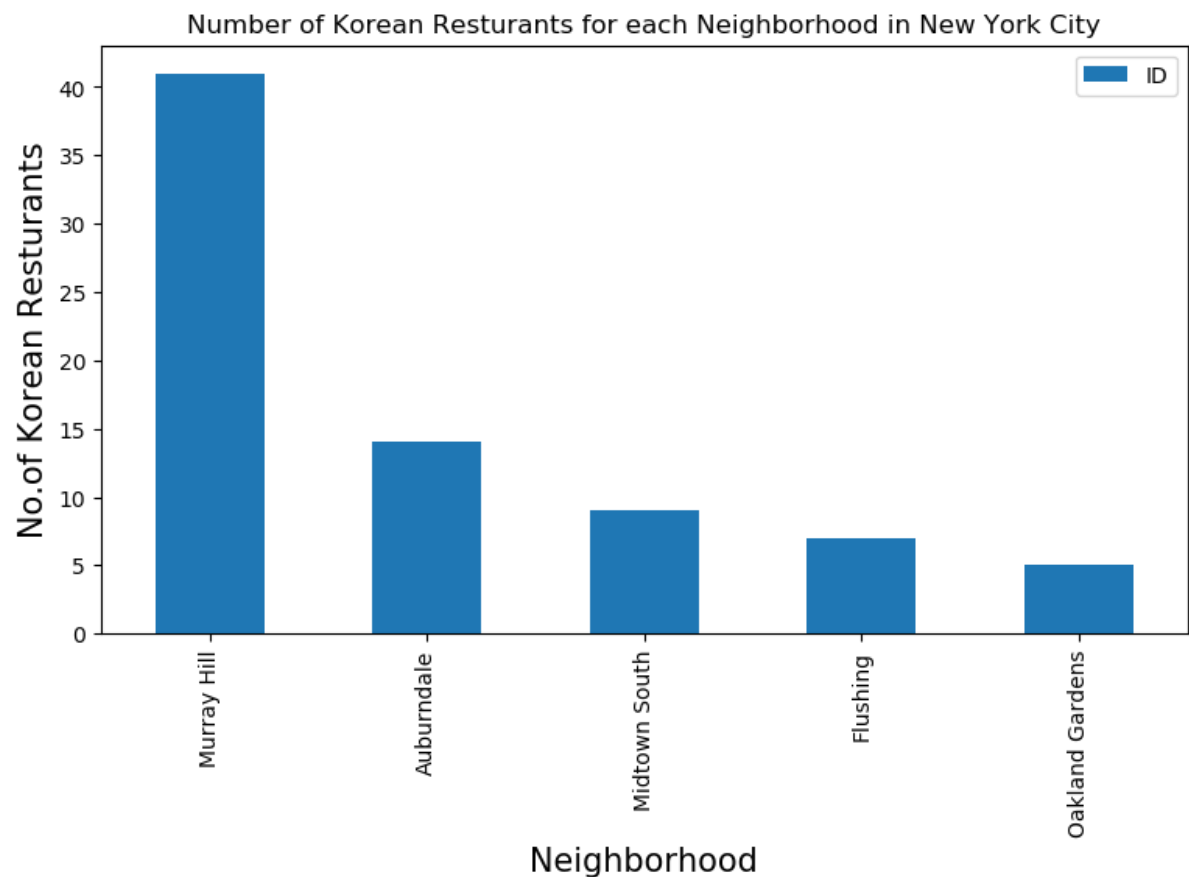
In [16]: `korean_rest_ny[korean_rest_ny['Neighborhood']=='Murray Hill']`

Out[16]:

| | Borough | Neighborhood | ID | Name |
|---|---|---|---|---|
| 7 | Manhattan | Murray Hill | 41e46880f964a520d81e1fe3 | Don's Bogam Korean BBQ & Wine |
| 8 | Manhattan | Murray Hill | 547d03e3498eb32c879589da | Baekjeong NYC (Kang Ho Dong Baekjeong) |
| 9 | Manhattan | Murray Hill | 560b19b1498ee5e226c151f9 | Her Name is Han |
| 10 | Manhattan | Murray Hill | 517563f9498e0a4859d08fe4 | BCD Tofu House |
| 11 | Manhattan | Murray Hill | 4efe024000396c3b17c070e1 | Take 31 |
| 59 | Queens | Murray Hill | 4b830e44f964a520ebf430e3 | Hahm Ji Bach - 함지박 |
| 60 | Queens | Murray Hill | 4b8f0931f964a520d04533e3 | Mapo BBQ |
| 61 | Queens | Murray Hill | 49e10e0bf964a52089611fe3 | Mad For Chicken |
| 62 | Queens | Murray Hill | 4baeabe6f964a52037cd3be3 | Kum Sung Chik Naengmyun |
| 63 | Queens | Murray Hill | 56db53cc498eed9b68621019 | SGD Tofu House |
| 64 | Queens | Murray Hill | 5518a1a8498e4c7fe6268b88 | Jongro BBQ |
| 65 | Queens | Murray Hill | 5590598a498eb1c3f975b6a6 | Mr. Tofu |
| 66 | Queens | Murray Hill | 4c7ad3dda86837048bee144d | Geo Si Gi Restaurant |
| 67 | Queens | Murray Hill | 4ad3bfabf964a52016e620e3 | Han Joo |
| 68 | Queens | Murray Hill | 57c0c497cd10e5cf8037c207 | Butcher's Cut |
| 69 | Queens | Murray Hill | 548cd91c498e98c507b00851 | 돌아온 1.5 닭갈비 |
| 70 | Queens | Murray Hill | 569ada51498eb50a95dab87f | Pizza Maru |
| 71 | Queens | Murray Hill | 5147a0bce4b09c3bed35c23b | 큰손 칼국수 |
| 72 | Queens | Murray Hill | 4ca67385b7106dcb6e3b5ea5 | Bonjuk Korean Traditional Porridge Restaurant |
| 73 | Queens | Murray Hill | 4bd3578041b9ef3b05f0ffe5 | Tong Sam Gyup Goo Yi Restaurant |
| 74 | Queens | Murray Hill | 51c612d9498e52a02241e27b | 병천자매순대 (Byun Chung Soon Dae Restaurant) (Byun ... |
| 75 | Queens | Murray Hill | 4eefef69be7ba3ed7b202455 | Arirang |
| 76 | Queens | Murray Hill | 58756dc845c3ed5546c88309 | Sodam |
| 77 | Queens | Murray Hill | 4c06f2c00e0a2d7f85abec0c | Hansol Young Yang Center |
| 78 | Queens | Murray Hill | 5078a6d6e4b065f1dcd66110 | Emone Korean Family Restaurant |
| 79 | Queens | Murray Hill | 548b8548498e88452c81006e | Parksanbal Babs |
| 80 | Queens | Murray Hill | 4a469916f964a5202ba91fe3 | Picnic Garden BBQ Buffet House |
| 81 | Queens | Murray Hill | 4e665433b0fb188e8f56fb2b | Su Ra Chung |
| 82 | Queens | Murray Hill | 5521d4be498ed5c1ea40e4de | Yupdduk (동대문 엽기떡볶이) (Yupdduk) |
| 83 | Queens | Murray Hill | 4cdf457c78ddf04ddd07a098 | Myung San |
| 84 | Queens | Murray Hill | 4bf814b25317a5934f1fff7e | Je Ju Do Restaurant |
| 85 | Queens | Murray Hill | 4eb5c949cc2143e828277958 | Kim Chayul's Myung Poom Kalbi |
| 86 | Queens | Murray Hill | 4d85677302eb5481ee0744f5 | Gugongtan |

|    | Borough | Neighborhood | ID | Name |
|----|---------|--------------|------|------|
| 87 | Queens | Murray Hill | 4e41cfa1b61ca5ba3b1f6db5 | TongTong Tonkatsu |
| 88 | Queens | Murray Hill | 4b89c358f964a5207c4d32e3 | Sam Won Gahk |
| 89 | Queens | Murray Hill | 4e8b2f17775b3662040325e8 | 롤리김밥 Rolly Kimbab |
| 90 | Queens | Murray Hill | 4ec2cccf8231a83de8cf15ed | DAHEEN WANG MANDOO |
| 91 | Queens | Murray Hill | 4c119b91d41e76b0d3cc310d | Zurang |
| 92 | Queens | Murray Hill | 4b79ffc4f964a520651e2fe3 | Song's Family Food |
| 93 | Queens | Murray Hill | 4f848a81e4b0c96e1d03e5db | Dae Bak |
| 94 | Queens | Murray Hill | 5008ac8be4b0dfac2d882520 | 食客 |

Murray Hill in Queens has the highest number of Korean Resturants with a total count of 41.

Now we will get the ranking of each resturant for further analysis.

```
In [ ]:  #CLIENT_ID = 'KW0PYRNOOMLGG21QRWRCIYD44NL4NUZOMRUDZ3TLL3PQLIWP'
         #CLIENT_SECRET = 'LS3OJBEQW4I0EEQNYVU1VQNO2FUGNCMWVSVQXQYF5TUVVXMC'
         #VERSION = '20180605' # Foursquare API version
```

```
In [17]:  # prepare neighborhood list that contains korean resturants
          column_names=['Borough', 'Neighborhood', 'ID','Name','Likes','Rating','Tips']
          korean_rest_stats_ny=pd.DataFrame(columns=column_names)
          count=1


          for row in korean_rest_ny.values.tolist():
              Borough,Neighborhood,ID,Name=row
              try:
                  venue_details=get_venue_details(ID)
                  print(venue_details)
                  id,name,likes,rating,tips=venue_details.values.tolist()[0]
              except IndexError:
                  print('No data available for id=',ID)
                  # we will assign 0 value for these resturants as they may have been
                  #recently opened or details does not exist in FourSquare Database
                  id,name,likes,rating,tips=[0]*5
              print('(',count,'/',len(korean_rest_ny),')','processed')
              korean_rest_stats_ny = korean_rest_stats_ny.append({'Borough': Borough,
                                                    'Neighborhood': Neighborhood,
                                                    'ID': id,
                                                    'Name' : name,
                                                    'Likes' : likes,
                                                    'Rating' : rating,
                                                    'Tips' : tips
                                                   }, ignore_index=True)

              count+=1
```

```
                              ID          Name  Likes  Rating  Tips
0  57049cb4498efcebf6578c1b  Cafe Lily      7     6.5     7
( 1 / 115 ) processed
                              ID                        Name  Likes  Rating  Tips
0  4c9d5c0303133704a96f5ed5  Cafe At Your Mother-in-Law    28     7.6    28
( 2 / 115 ) processed
                              ID          Name  Likes  Rating  Tips
0  4fa162e0e4b0badc81404a51  Kimchi Grill    289     8.4   108
( 3 / 115 ) processed
                              ID      Name  Likes  Rating  Tips
0  52bf3053498e754b09a440b5  Dotory    138     8.5    44
( 4 / 115 ) processed
                              ID       Name  Likes  Rating  Tips
0  5bba42ff7dc9e1002cd1a1df  Haenyeo     38     8.1     9
( 5 / 115 ) processed
                              ID         Name  Likes  Rating  Tips
0  5ae4e10ffe3740002d8a897e  Slow Loris     12     8.1     5
( 6 / 115 ) processed
                              ID      Name  Likes  Rating  Tips
0  52bf3053498e754b09a440b5  Dotory    138     8.5    44
( 7 / 115 ) processed
                              ID                         Name  Likes  Rating  \
0  41e46880f964a520d81e1fe3  Don's Bogam Korean BBQ & Wine    564     8.8

   Tips
0   145
( 8 / 115 ) processed
                              ID                                Name  Likes  \
0  547d03e3498eb32c879589da  Baekjeong NYC (Kang Ho Dong Baekjeong)    824

   Rating  Tips
0     9.2   155
( 9 / 115 ) processed
                              ID             Name  Likes  Rating  Tips
0  560b19b1498ee5e226c151f9  Her Name is Han    825     9.0   178
( 10 / 115 ) processed
                              ID           Name  Likes  Rating  Tips
0  517563f9498e0a4859d08fe4  BCD Tofu House   1198     9.1   198
( 11 / 115 ) processed
                              ID     Name  Likes  Rating  Tips
0  4efe024000396c3b17c070e1  Take 31    272     8.7    57
( 12 / 115 ) processed
                              ID              Name  Likes  Rating  Tips
0  578bec6c498e3150fc369f3b  Thursday Kitchen    269     8.9    70
( 13 / 115 ) processed
                              ID    Name  Likes  Rating  Tips
0  54cd73be498e9ab78644ab32  Oiji    322     9.0    79
( 14 / 115 ) processed
                              ID       Name  Likes  Rating  Tips
0  4e67f1c7d16433b90090c8f3  Jungsik    152     8.7    55
( 15 / 115 ) processed
                              ID     Name  Likes  Rating  Tips
0  56a14149498e9983c0199038  Mokja     23     8.0     6
( 16 / 115 ) processed
                              ID Name  Likes  Rating  Tips
0  5c0db9ecbfc6d0002c85e28e  Kal     11     8.1     4
( 17 / 115 ) processed
```

```
                          ID              Name   Likes   Rating   Tips
0   4aa44fa8f964a520554620e3   Chung Ki-Wa      24      7.7      18
( 18 / 115 ) processed
                          ID              Name   Likes   Rating   Tips
0   4b1dcb05f964a5205d1524e3   Hae Woon Dae     30      8.1      10
( 19 / 115 ) processed
                          ID              Name   Likes   Rating   Tips
0   4b1dcb05f964a5205d1524e3   Hae Woon Dae     30      8.1      10
( 20 / 115 ) processed
                          ID         Name   Likes   Rating   Tips
0   4ae39cb6f964a520439721e3   Debasaki      67      8.2      35
( 21 / 115 ) processed
                          ID         Name   Likes   Rating   Tips
0   4b80790bf964a5209b7530e3   Kim Ga Nae    104      7.9      45
( 22 / 115 ) processed
                          ID         Name   Likes   Rating   Tips
0   4aa5ae46f964a520264920e3   KumGangSan    96      7.5      36
( 23 / 115 ) processed
                          ID             Name   Likes   Rating   Tips
0   4abd475df964a520668920e3   San Soo Kap San  31      7.4      11
( 24 / 115 ) processed
                          ID           Name   Likes   Rating   Tips
0   57c0c497cd10e5cf8037c207   Butcher's Cut   11      8.3       1
( 25 / 115 ) processed
                          ID                             Name   Likes   Rating  \
0   4c86de6de602b1f78c9fc37a   Chung Moo Rollrice and Dongas    11      7.2

     Tips
0      10
( 26 / 115 ) processed
                          ID   Name   Likes   Rating   Tips
0   4bd6436dcfa7b713606927da   Gahwa    29      7.8      11
( 27 / 115 ) processed
                          ID   Name   Likes   Rating   Tips
0   5630104d498e08f2c7217877   Doma     17      7.5       4
( 28 / 115 ) processed
                          ID               Name   Likes   Rating   Tips
0   57ab54da498e7d61e0c1fe0e   Pelicana Chicken   24      7.6       7
( 29 / 115 ) processed
                          ID                  Name   Likes   Rating   Tips
0   4d3c9f7ea2e4b1f707f4ea25   Sky Garden @ Spa Castle  17     7.8       4
( 30 / 115 ) processed
                          ID        Name   Likes   Rating   Tips
0   4c8425a0d34ca1436d443c80   Ding Dong    3      6.6       8
( 31 / 115 ) processed
                          ID              Name   Likes   Rating   Tips
0   4c7193e2f3279c74b4f2a62d   BonChon Chicken   20      7.2      14
( 32 / 115 ) processed
                          ID   Name   Likes   Rating   Tips
0   4b565b29f964a520eb0c28e3   TANG     87      8.2      25
( 33 / 115 ) processed
                          ID      Name   Likes   Rating   Tips
0   4eefef69be7ba3ed7b202455   Arirang   20      8.4      13
( 34 / 115 ) processed
                          ID                             Name   Likes   Rating
\
0   4bd3578041b9ef3b05f0ffe5   Tong Sam Gyup Goo Yi Restaurant   36      8.4
```

```
    Tips
0    10
( 35 / 115 ) processed
                                ID            Name  Likes  Rating  Tips
0  4e9a22285503cfce742062a1  Galbi Ma Eul     28     7.4     9
( 36 / 115 ) processed
                                ID                   Name  Likes  Rating  Tips
0  4dd9a5cfc65bee535ae8e26f  Pado Sushi Restaurant     16     8.1     1
( 37 / 115 ) processed
                                ID         Name  Likes  Rating  Tips
0  4c49dd1ffbafc9282eb27fdb  Nolbu Sushi     17     7.1    11
( 38 / 115 ) processed
                                ID            Name  Likes  Rating  Tips
0  4bd2147ba8b3a593fc15675f  San Soo Kap San     42     6.6    16
( 39 / 115 ) processed
                                ID        Name  Likes  Rating  Tips
0  4cdf457c78ddf04ddd07a098  Myung San      8     7.0     3
( 40 / 115 ) processed
                                ID                  Name  Likes  Rating  Tips
0  4c1eb73bb4e62d7fcebade93  Bang Ga Ne Restaurant      5     6.8     1
( 41 / 115 ) processed
                                ID                 Name  Likes  Rating  Tips
0  4bf814b25317a5934f1fff7e  Je Ju Do Restaurant     12     7.0     5
( 42 / 115 ) processed
                                ID                Name  Likes  Rating  Tips
0  4bec93d8fd60a5939f403bf1  Gahwa Sulungtang     10     6.4     7
( 43 / 115 ) processed
                                ID                    Name  Likes  Rating  Tips
0  4e8b2f17775b3662040325e8  롤리김밥 Rolly Kimbab     17     6.7     9
( 44 / 115 ) processed
                                ID                 Name  Likes  Rating  Tips
0  4b79ffc4f964a520651e2fe3  Song's Family Food     11     6.0    10
( 45 / 115 ) processed
Empty DataFrame
Columns: [ID, Name, Likes, Rating, Tips]
Index: []
No data available for id= 54bd8c20498e5618f8470325
( 46 / 115 ) processed
Empty DataFrame
Columns: [ID, Name, Likes, Rating, Tips]
Index: []
No data available for id= 5b3badba3731ee002cc9e31a
( 47 / 115 ) processed
Empty DataFrame
Columns: [ID, Name, Likes, Rating, Tips]
Index: []
No data available for id= 4c7af1aca8683704fa59154d
( 48 / 115 ) processed
Empty DataFrame
Columns: [ID, Name, Likes, Rating, Tips]
Index: []
No data available for id= 4c350e28a0ced13a3140196e
( 49 / 115 ) processed
Empty DataFrame
Columns: [ID, Name, Likes, Rating, Tips]
Index: []
```

```
            No data available for id= 4c71ac6dad69b60c49ac81b9
            ( 50 / 115 ) processed
            Empty DataFrame
            Columns: [ID, Name, Likes, Rating, Tips]
            Index: []
            No data available for id= 4c71ac6dad69b60c49ac81b9
            ( 51 / 115 ) processed
            Empty DataFrame
            Columns: [ID, Name, Likes, Rating, Tips]
            Index: []
            No data available for id= 4c7af1aca8683704fa59154d
            ( 52 / 115 ) processed
            Empty DataFrame
            Columns: [ID, Name, Likes, Rating, Tips]
            Index: []
            No data available for id= 5b3badba3731ee002cc9e31a
            ( 53 / 115 ) processed
            Empty DataFrame
            Columns: [ID, Name, Likes, Rating, Tips]
            Index: []
            No data available for id= 4c350e28a0ced13a3140196e
            ( 54 / 115 ) processed
                                   ID                      Name  Likes  Rating  Tips
            0  4c8adb923dc2a1cda816b132  Bi Won Korean Restaurant     21     7.7     8
            ( 55 / 115 ) processed
                                   ID             Name  Likes  Rating  Tips
            0  58efc04912c8f0495ec6865c  Chilsung Garden     15     7.7     1
            ( 56 / 115 ) processed
                                   ID          Name  Likes  Rating  Tips
            0  526c1acf11d288dc8354b7b9  Rolly Kimbab     26     7.2     9
            ( 57 / 115 ) processed
            Empty DataFrame
            Columns: [ID, Name, Likes, Rating, Tips]
            Index: []
            No data available for id= 4b9d4ce7f964a5209ba136e3
            ( 58 / 115 ) processed
            Empty DataFrame
            Columns: [ID, Name, Likes, Rating, Tips]
            Index: []
            No data available for id= 4c5ed60d857ca5936497d0cb
            ( 59 / 115 ) processed
                                   ID               Name  Likes  Rating  Tips
            0  4b830e44f964a520ebf430e3  Hahm Ji Bach - 함지박    212     8.8    81
            ( 60 / 115 ) processed
                                   ID      Name  Likes  Rating  Tips
            0  4b8f0931f964a520d04533e3  Mapo BBQ     79     8.6    32
            ( 61 / 115 ) processed
                                   ID            Name  Likes  Rating  Tips
            0  49e10e0bf964a52089611fe3  Mad For Chicken    216     9.1    69
            ( 62 / 115 ) processed
                                   ID                   Name  Likes  Rating  Tips
            0  4baeabe6f964a52037cd3be3  Kum Sung Chik Naengmyun     14     7.9     5
            ( 63 / 115 ) processed
                                   ID           Name  Likes  Rating  Tips
            0  56db53cc498eed9b68621019  SGD Tofu House     11     8.2     0
            ( 64 / 115 ) processed
                                   ID        Name   Likes  Rating  Tips
```

```
0  5518a1a8498e4c7fe6268b88   Jongro BBQ     47      7.8       7
( 65 / 115 ) processed
                        ID      Name   Likes   Rating   Tips
0  5590598a498eb1c3f975b6a6   Mr. Tofu     18      7.6       3
( 66 / 115 ) processed
                        ID              Name   Likes   Rating   Tips
0  4c7ad3dda86837048bee144d   Geo Si Gi Restaurant     33      7.6      12
( 67 / 115 ) processed
                        ID      Name   Likes   Rating   Tips
0  4ad3bfabf964a52016e620e3   Han Joo     26      7.4      20
( 68 / 115 ) processed
                        ID            Name   Likes   Rating   Tips
0  57c0c497cd10e5cf8037c207   Butcher's Cut     11      8.3       1
( 69 / 115 ) processed
                        ID          Name   Likes   Rating   Tips
0  548cd91c498e98c507b00851   돌아온 1.5 닭갈비     15      7.8       4
( 70 / 115 ) processed
                        ID      Name   Likes   Rating   Tips
0  569ada51498eb50a95dab87f   Pizza Maru     25      7.3       9
( 71 / 115 ) processed
                        ID    Name   Likes   Rating   Tips
0  5147a0bce4b09c3bed35c23b   큰손 칼국수     6      7.2       1
( 72 / 115 ) processed
                        ID                                          Name   \
0  4ca67385b7106dcb6e3b5ea5   Bonjuk Korean Traditional Porridge Restaurant

    Likes   Rating   Tips
0      21      7.1      6
( 73 / 115 ) processed
                        ID                          Name   Likes   Rating
\
0  4bd3578041b9ef3b05f0ffe5   Tong Sam Gyup Goo Yi Restaurant     36      8.4

    Tips
0    10
( 74 / 115 ) processed
                        ID   \
0  51c612d9498e52a02241e27b

                                           Name   Likes   Rating   Tips
0  병천자매순대 (Byun Chung Soon Dae Restaurant) (Byun ...     16      7.2
4
( 75 / 115 ) processed
                        ID      Name   Likes   Rating   Tips
0  4eefef69be7ba3ed7b202455   Arirang     20      8.4      13
( 76 / 115 ) processed
                        ID    Name   Likes   Rating   Tips
0  58756dc845c3ed5546c88309   Sodam     9      7.2       2
( 77 / 115 ) processed
                        ID                     Name   Likes   Rating   Tips
0  4c06f2c00e0a2d7f85abec0c   Hansol Young Yang Center     10      7.7       5
( 78 / 115 ) processed
                        ID                         Name   Likes   Rating   \
0  5078a6d6e4b065f1dcd66110   Emone Korean Family Restaurant     10      6.9

    Tips
0     1
```

```
( 79 / 115 ) processed
                         ID              Name    Likes   Rating   Tips
0   548b8548498e88452c81006e   Parksanbal Babs     11      7.4     2
( 80 / 115 ) processed
                         ID                            Name   Likes   Rating  \
0   4a469916f964a5202ba91fe3   Picnic Garden BBQ Buffet House   117      6.9

    Tips
0    60
( 81 / 115 ) processed
                         ID         Name   Likes   Rating   Tips
0   4e665433b0fb188e8f56fb2b   Su Ra Chung      6      6.6     4
( 82 / 115 ) processed
                         ID                              Name   Likes   Rating  \
0   5521d4be498ed5c1ea40e4de   Yupdduk (동대문 엽기떡볶이) (Yupdduk)     10
6.7

    Tips
0     3
( 83 / 115 ) processed
                         ID        Name   Likes   Rating   Tips
0   4cdf457c78ddf04ddd07a098   Myung San      8      7.0     3
( 84 / 115 ) processed
                         ID               Name   Likes   Rating   Tips
0   4bf814b25317a5934f1fff7e   Je Ju Do Restaurant    12     7.0     5
( 85 / 115 ) processed
                         ID                        Name   Likes   Rating  \
0   4eb5c949cc2143e828277958   Kim Chayul's Myung Poom Kalbi    8      6.9

    Tips
0     7
( 86 / 115 ) processed
                         ID        Name   Likes   Rating   Tips
0   4d85677302eb5481ee0744f5   Gugongtan     13      6.2     7
( 87 / 115 ) processed
                         ID              Name   Likes   Rating   Tips
0   4e41cfa1b61ca5ba3b1f6db5   TongTong Tonkatsu    8      6.6     2
( 88 / 115 ) processed
                         ID           Name   Likes   Rating   Tips
0   4b89c358f964a5207c4d32e3   Sam Won Gahk     19      6.6     4
( 89 / 115 ) processed
                         ID              Name   Likes   Rating   Tips
0   4e8b2f17775b3662040325e8   롤리김밥 Rolly Kimbab    17     6.7     9
( 90 / 115 ) processed
                         ID                Name   Likes   Rating   Tips
0   4ec2cccf8231a83de8cf15ed   DAHEEN WANG MANDOO     5      5.9     7
( 91 / 115 ) processed
                         ID      Name   Likes   Rating   Tips
0   4c119b91d41e76b0d3cc310d   Zurang     13      6.1     4
( 92 / 115 ) processed
                         ID                Name   Likes   Rating   Tips
0   4b79ffc4f964a520651e2fe3   Song's Family Food    11     6.0    10
( 93 / 115 ) processed
Empty DataFrame
Columns: [ID, Name, Likes, Rating, Tips]
Index: []
No data available for id= 4f848a81e4b0c96e1d03e5db
```

```
( 94 / 115 ) processed
Empty DataFrame
Columns: [ID, Name, Likes, Rating, Tips]
Index: []
No data available for id= 5008ac8be4b0dfac2d882520
( 95 / 115 ) processed
Empty DataFrame
Columns: [ID, Name, Likes, Rating, Tips]
Index: []
No data available for id= 4dc9923322717adb0377893e
( 96 / 115 ) processed
                          ID      Name   Likes   Rating   Tips
0  5521c0a7498eef139bb748e7  Bonchon      47      7.6      11
( 97 / 115 ) processed
                          ID   Name   Likes   Rating   Tips
0  54cd73be498e9ab78644ab32  Oiji     322      9.0      79
( 98 / 115 ) processed
                          ID      Name   Likes   Rating   Tips
0  4e67f1c7d16433b90090c8f3  Jungsik    152      8.7      55
( 99 / 115 ) processed
                          ID        Name   Likes   Rating   Tips
0  540f86da498e020149fa7676  Jongro BBQ    798      9.3     148
( 100 / 115 ) processed
                          ID                      Name   Likes   Rating   Tips
0  5c01ccc14ac28a002c3cbd8d  Anytime Soju Bar and Eatery    27      8.9     26
( 101 / 115 ) processed
                          ID                Name   Likes   Rating   Tips
0  5aab0d2ae179107b87768ff8  Samwon Garden BBQ     69      8.7     15
( 102 / 115 ) processed
                          ID             Name   Likes   Rating   Tips
0  517563f9498e0a4859d08fe4  BCD Tofu House   1198      9.1     198
( 103 / 115 ) processed
                          ID         Name   Likes   Rating   Tips
0  4a9d3c1af964a520ff3720e3  E-Mo Kimbap    107      8.7     42
( 104 / 115 ) processed
                          ID                                  Name   Likes  \
0  547d03e3498eb32c879589da  Baekjeong NYC (Kang Ho Dong Baekjeong)    824

   Rating  Tips
0     9.2   155
( 105 / 115 ) processed
                          ID                              Name   Likes   Rating  \
0  41e46880f964a520d81e1fe3  Don's Bogam Korean BBQ & Wine      564      8.8

   Tips
0   145
( 106 / 115 ) processed
                          ID               Name   Likes   Rating   Tips
0  560b19b1498ee5e226c151f9  Her Name is Han     825      9.0     178
( 107 / 115 ) processed
                          ID     Name   Likes   Rating   Tips
0  4efe024000396c3b17c070e1  Take 31    272      8.7     57
( 108 / 115 ) processed
Empty DataFrame
Columns: [ID, Name, Likes, Rating, Tips]
Index: []
No data available for id= 4dc9923322717adb0377893e
```

```
( 109 / 115 ) processed
Empty DataFrame
Columns: [ID, Name, Likes, Rating, Tips]
Index: []
No data available for id= 4dc9923322717adb0377893e
( 110 / 115 ) processed
                          ID              Name  Likes  Rating  Tips
0  578bec6c498e3150fc369f3b  Thursday Kitchen    269     8.9    70
( 111 / 115 ) processed
                          ID      Name  Likes  Rating  Tips
0  4c0c2765a1b32d7f49279cf0  Sik Gaek     77     8.4    42
( 112 / 115 ) processed
                          ID             Name  Likes  Rating  Tips
0  57ab54da498e7d61e0c1fe0e  Pelicana Chicken     24     7.6     7
( 113 / 115 ) processed
                          ID  Name  Likes  Rating  Tips
0  5630104d498e08f2c7217877  Doma     17     7.5     4
( 114 / 115 ) processed
                          ID                  Name  Likes  Rating  Tips
0  4d3c9f7ea2e4b1f707f4ea25  Sky Garden @ Spa Castle   17     7.8     4
( 115 / 115 ) processed
```

In [18]: `korean_rest_stats_ny.head()`

Out[18]:

|   | Borough | Neighborhood | ID | Name | Likes | Rating | Tips |
|---|---------|-------------|-----|------|-------|--------|------|
| 0 | Brooklyn | Bensonhurst | 57049cb4498efcebf6578c1b | Cafe Lily | 7 | 6.5 | 7 |
| 1 | Brooklyn | Brighton Beach | 4c9d5c0303133704a96f5ed5 | Cafe At Your Mother-in-Law | 28 | 7.6 | 28 |
| 2 | Brooklyn | Prospect Heights | 4fa162e0e4b0badc81404a51 | Kimchi Grill | 289 | 8.4 | 108 |
| 3 | Brooklyn | Williamsburg | 52bf3053498e754b09a440b5 | Dotory | 138 | 8.5 | 44 |
| 4 | Brooklyn | Park Slope | 5bba42ff7dc9e1002cd1a1df | Haenyeo | 38 | 8.1 | 9 |

In [19]: `korean_rest_stats_ny.shape`

Out[19]: (115, 7)

In [20]: `korean_rest_ny.shape`

Out[20]: (115, 4)

So we got data for all resturants. Now lets save this data to a csv sheet, in case we by mistake modify it. As the number of calls to get details for venue are premium call and have limit of 500 per day, we will refer to saved data sheet csv if required.

In [21]: `korean_rest_stats_ny.to_csv('korean_rest_stats_ny.csv', index=False)`

Lets verify the data from saved csv file

In [22]: `korean_rest_stats_ny_csv=pd.read_csv('korean_rest_stats_ny.csv')`

In [23]: `korean_rest_stats_ny_csv.shape`

Out[23]: `(115, 7)`

In [24]: `korean_rest_stats_ny_csv.head()`

Out[24]:

|   | Borough | Neighborhood | ID | Name | Likes | Rating | Tips |
|---|---------|--------------|-----|------|-------|--------|------|
| 0 | Brooklyn | Bensonhurst | 57049cb4498efcebf6578c1b | Cafe Lily | 7 | 6.5 | 7 |
| 1 | Brooklyn | Brighton Beach | 4c9d5c0303133704a96f5ed5 | Cafe At Your Mother-in-Law | 28 | 7.6 | 28 |
| 2 | Brooklyn | Prospect Heights | 4fa162e0e4b0badc81404a51 | Kimchi Grill | 289 | 8.4 | 108 |
| 3 | Brooklyn | Williamsburg | 52bf3053498e754b09a440b5 | Dotory | 138 | 8.5 | 44 |
| 4 | Brooklyn | Park Slope | 5bba42ff7dc9e1002cd1a1df | Haenyeo | 38 | 8.1 | 9 |

In [25]: `korean_rest_stats_ny.info()`

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 115 entries, 0 to 114
Data columns (total 7 columns):
Borough          115 non-null object
Neighborhood     115 non-null object
ID               115 non-null object
Name             115 non-null object
Likes            115 non-null object
Rating           115 non-null float64
Tips             115 non-null object
dtypes: float64(1), object(6)
memory usage: 6.4+ KB
```

We see that values like Likes, Tips are strig values. We would need to convert them into float for further analysis

In [26]: `korean_rest_stats_ny['Likes']=korean_rest_stats_ny['Likes'].astype('float64')`

In [27]: `korean_rest_stats_ny['Tips']=korean_rest_stats_ny['Tips'].astype('float64')`

In [28]:   `korean_rest_stats_ny.info()`

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 115 entries, 0 to 114
Data columns (total 7 columns):
Borough          115 non-null object
Neighborhood     115 non-null object
ID               115 non-null object
Name             115 non-null object
Likes            115 non-null float64
Rating           115 non-null float64
Tips             115 non-null float64
dtypes: float64(3), object(4)
memory usage: 6.4+ KB
```

Now the data types looks correct

In [29]:   `# Resturant with maximum Likes`
           `korean_rest_stats_ny.iloc[korean_rest_stats_ny['Likes'].idxmax()]`

Out[29]:
```
Borough                      Manhattan
Neighborhood                Murray Hill
ID              517563f9498e0a4859d08fe4
Name                    BCD Tofu House
Likes                             1198
Rating                             9.1
Tips                               198
Name: 10, dtype: object
```

In [30]:   `# Resturant with maximum Rating`
           `korean_rest_stats_ny.iloc[korean_rest_stats_ny['Rating'].idxmax()]`

Out[30]:
```
Borough                      Manhattan
Neighborhood              Midtown South
ID              540f86da498e020149fa7676
Name                        Jongro BBQ
Likes                              798
Rating                             9.3
Tips                               148
Name: 99, dtype: object
```

In [31]:   `# Resturant with maximum Tips`
           `korean_rest_stats_ny.iloc[korean_rest_stats_ny['Tips'].idxmax()]`

Out[31]:
```
Borough                      Manhattan
Neighborhood                Murray Hill
ID              517563f9498e0a4859d08fe4
Name                    BCD Tofu House
Likes                             1198
Rating                             9.1
Tips                               198
Name: 10, dtype: object
```

Now lets visualize neighborhood with maximum average rating of resturants

```
In [32]: ny_neighborhood_stats=korean_rest_stats_ny.groupby('Neighborhood',as_index=Fal
         se).mean()[['Neighborhood','Rating']]
         ny_neighborhood_stats.columns=['Neighborhood','Average Rating']
```

```
In [33]: ny_neighborhood_stats.sort_values(['Average Rating'],ascending=False).head(10)
```

Out[33]:

|  | Neighborhood | Average Rating |
|---|---|---|
| 18 | Noho | 9.000000 |
| 8 | East Village | 8.950000 |
| 16 | Midtown South | 8.933333 |
| 26 | Stuyvesant Town | 8.900000 |
| 29 | Tribeca | 8.700000 |
| 5 | Civic Center | 8.700000 |
| 31 | Williamsburg | 8.500000 |
| 25 | South Side | 8.500000 |
| 22 | Prospect Heights | 8.400000 |
| 12 | Jackson Heights | 8.100000 |

Above are the top neighborhoods with top average rating of Korean resturants

```
In [34]: ny_borough_stats=korean_rest_stats_ny.groupby('Borough',as_index=False).mean()
         [['Borough','Rating']]
         ny_borough_stats.columns=['Borough','Average Rating']
```

```
In [35]: ny_borough_stats.sort_values(['Average Rating'],ascending=False).head()
```

Out[35]:

|  | Borough | Average Rating |
|---|---|---|
| 1 | Manhattan | 8.876190 |
| 0 | Brooklyn | 7.957143 |
| 2 | Queens | 6.065517 |

Similarly these are the average rating of Korean Resturants for each Borough.

Lets visualize it.

In [36]:
```python
plt.figure(figsize=(9,5), dpi = 100)
# title
plt.title('Average rating of Korean Resturants for each Borough')
#On x-axis
plt.xlabel('Borough', fontsize = 15)
#On y-axis
plt.ylabel('Average Rating', fontsize=15)
#giving a bar plot
korean_rest_stats_ny.groupby('Borough').mean()['Rating'].plot(kind='bar')
#Legend
plt.legend()
#displays the plot
plt.show()
```

Average rating of Korean Resturants for each Borough
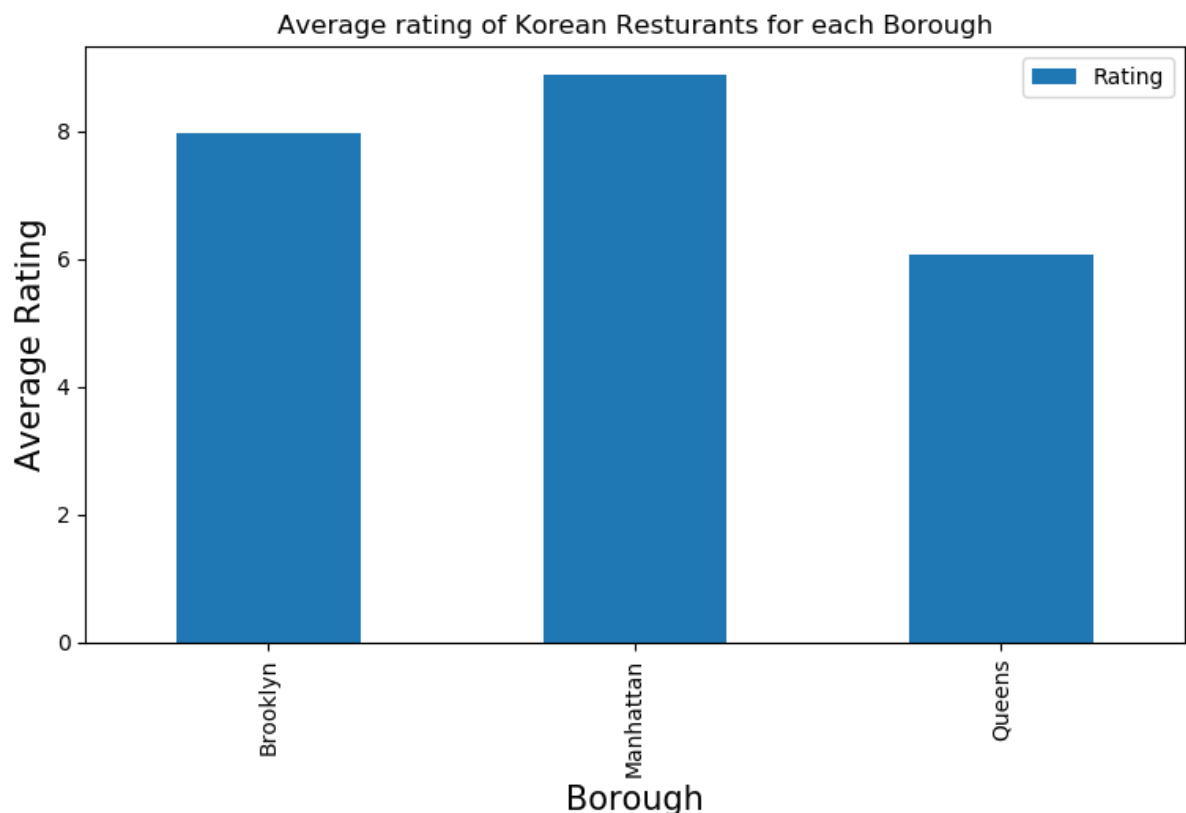
We will consider all the neighborhoods with average rating greater or equal 9.0 to visualize on map

In [43]:
```python
ny_neighborhood_stats=ny_neighborhood_stats[ny_neighborhood_stats['Average Rating']>=9.0]
```

In [44]:
```python
ny_neighborhood_stats
```

Out[44]:

|    | Neighborhood | Average Rating |
|----|--------------|----------------|
| 18 | Noho         | 9.0            |

We will join this dataset to original new york data to get longitude and latitude

In [45]:
```python
ny_neighborhood_stats=pd.merge(ny_neighborhood_stats,new_york_data, on='Neighb
orhood')
```

In [46]:
```python
ny_neighborhood_stats=ny_neighborhood_stats[['Borough','Neighborhood','Latitud
e','Longitude','Average Rating']]
```

In [47]:
```python
ny_neighborhood_stats
```

Out[47]:

|   | Borough | Neighborhood | Latitude | Longitude | Average Rating |
|---|---------|--------------|----------|-----------|----------------|
| 0 | Manhattan | Noho | 40.723259 | -73.988434 | 9.0 |

Now we will show this data on a map

In [48]:
```python
# create map and display it
ny_map = folium.Map(location=geo_location('New York'), zoom_start=12)
```

In [49]:
```python
# instantiate a feature group for the incidents in the dataframe
incidents = folium.map.FeatureGroup()

# loop through the 100 crimes and add each to the incidents feature group
for lat, lng, in ny_neighborhood_stats[['Latitude','Longitude']].values:
    incidents.add_child(
        folium.CircleMarker(
            [lat, lng],
            radius=10, # define how big you want the circle markers to be
            color='yellow',
            fill=True,
            fill_color='blue',
            fill_opacity=0.6
        )
    )
```

Lets add a new field to dataframe for labeling purpose

In [50]:
```python
ny_neighborhood_stats['Label']=ny_neighborhood_stats['Neighborhood']+', '+ny_n
eighborhood_stats['Borough']+'('+ny_neighborhood_stats['Average Rating'].map(s
tr)+')'
```

```
In [51]:   # add pop-up text to each marker on the map
           for lat, lng, label in ny_neighborhood_stats[['Latitude','Longitude','Label']]
           .values:
               folium.Marker([lat, lng], popup=label).add_to(ny_map)
           # add incidents to map
           ny_map.add_child(incidents)
```

Out[51]:
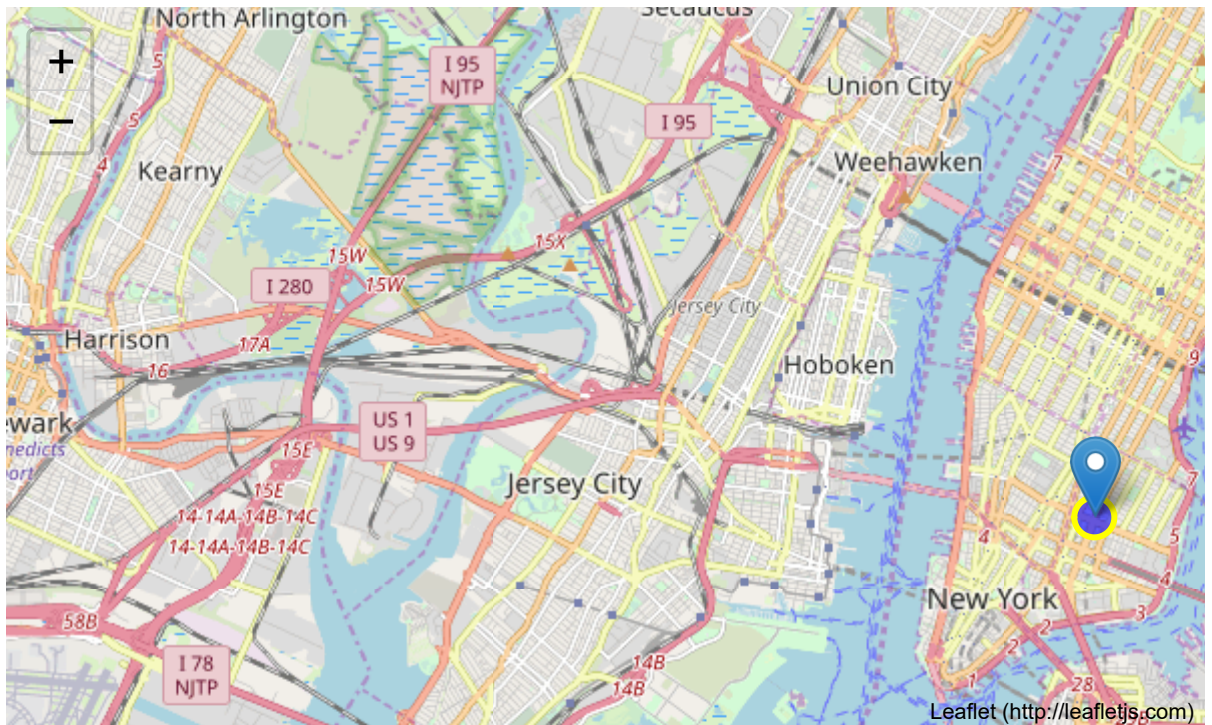


Now that we have visualized the Neighborhoods. Lets Visualize Boroughs based on average Rating

```
In [53]:   ny_map = folium.Map(location=geo_location('New York'), zoom_start=12)
           # borough boundaries downloaded from https://data.cityofnewyork.us/City-Govern
           ment/Borough-Boundaries/tqmj-j8zm
           ny_geo = r'Borough Boundaries.geojson'

           ny_map.choropleth(
               geo_data=ny_geo,
               data=ny_borough_stats,
               columns=['Borough', 'Average Rating'],
               key_on='feature.properties.boro_name',
               fill_color='YlOrRd',
               fill_opacity=0.7,
               line_opacity=0.2,
               legend_name='Average Rating'
           )

           # display map
           # as this is huge map data , we will save it to a file
           ny_map.save('borough_rating.html')
```

The saved image can be downloaded at :
https://github.com/cvsrao/IBMDataScienceCapstone/blob/master/borough_rating.html
(https://github.com/cvsrao/IBMDataScienceCapstone/blob/master/borough_rating.html)

# Conclusion

- Noho (Manhattan), East Village (Manhattan), Midtown South (Manhattan) are some of the best neighborhoods for korean cuisine.
- Queens have potential Korean Resturant Market.
- Staten Island and Bronx do not have any Korean Resturants.
- Manhattan is the best place to stay if you prefer Korean Cuisine.

# Limitations

- The ranking is purely on basis of rating of resturants
- The accuracy of data depends purely depends on the data provided by FourSquare

```
In [ ]:
```

```
In [ ]:
```