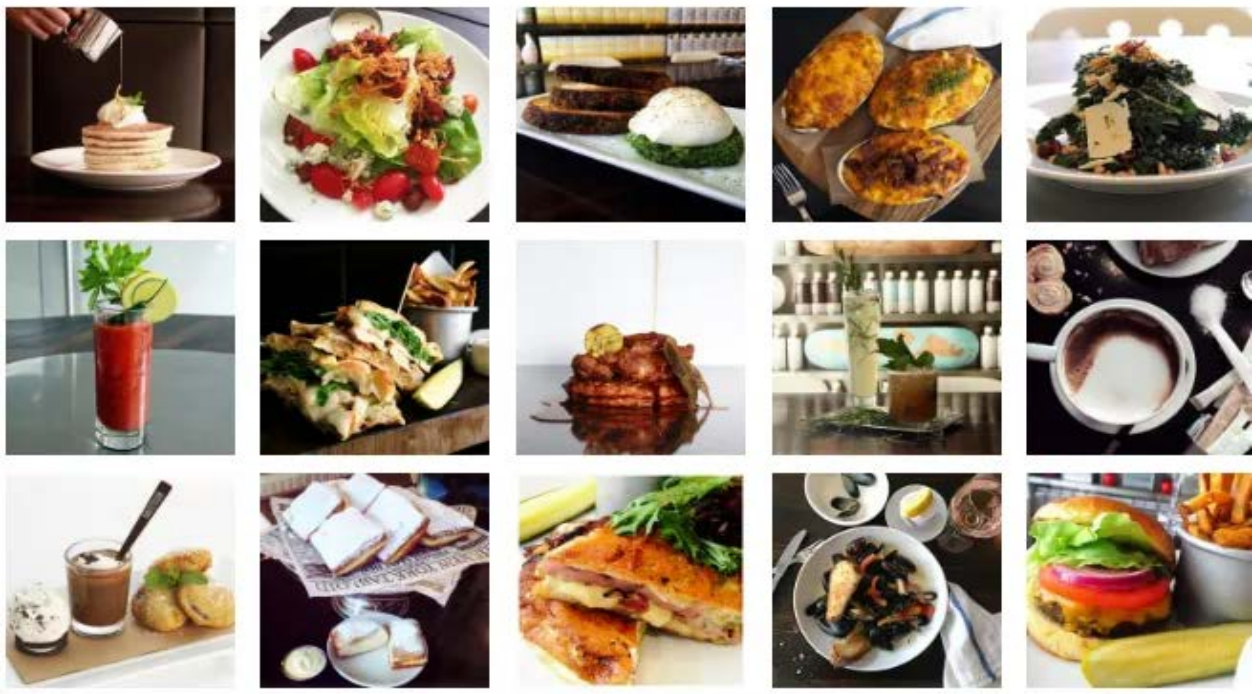
Description of the problem and discussion of the background

Manhattan

Background

Manhattan is the most densely populated of the five boroughs of New York City and would rank as the sixth-most populous in the U.S. It has many well-known districts and landmarks considered the capital of the world's culture and entertainment. For this reason, tourism is significant to this area. Based on Wikipedia," Tourism is vital to Manhattan's economy, and the landmarks of Manhattan are the focus of New York City's tourists, enumerating an eighth consecutive annual record of approximately 62.8 million visitors in 2017. According to The Broadway League, shows on Broadway sold about US$1.27 billion worth of tickets in the 2013–2014 season, an increase of 11.4% from US$1.139 billion in the 2012–2013 season; attendance in 2013–2014 stood at 12.21 million, representing a 5.5% increase from the 2012–2013 season's 11.57 million. As of June 2016, Manhattan had nearly 91,500 hotel rooms, a 26% increase from 2010."

Problem



The food industry was always one of the most crucial issues to attract tourists because it is an effective means to enter another culture. Traditional food and cuisine could be excellent to attract tourists and can be an integral part of the travel experience. For this reason, in this research project, I am trying to find the most populous foods in Manhattan. The results of this research will help those who are looking for a food business in this area.

Data

Data required in this project is mainly collecting from the Foursquare API. https://api.foursquare.com/v2/venues/explore. After getting the list of the foods and their locations, I got the coordinates of Manhattan by geocoding and created a folium map to visualize the data.

Methodology

First, we need to import all the tools we need including Pandas, Numpy, and Request. I imported folium for visualization that we need later as well after installing that. Mathplotlib is also imported at the end of the project to conclude the results in a bar chart.

In the next step, I applied my Client ID and Client Secret from FourSquare to get request for Manhattan.

In [109]:
```
CLIENT_ID = 'LNUQ1C4ZOQZBR10GEO5RJ3IDRY3UDWV3LH0WL44LAO
C33BI4' # your Foursquare ID
CLIENT_SECRET = 'D3QUH5JQ4FJ1ZDWBDU3FC5TMZSCHZWSDQMV1ZZ
AIYDXIUZOV' # your Foursquare Secret
VERSION = '20180604'
LIMIT = 40
print('Atosa Moayedi:')
print('CLIENT_ID: ' + CLIENT_ID)
print('CLIENT_SECRET:' + CLIENT_SECRET)
```

```
Atosa Moayedi:
CLIENT_ID: LNUQ1C4ZOQZBR10GEO5RJ3IDRY3UDWV3LH0WL44LAOC33
BI4
CLIENT_SECRET:D3QUH5JQ4FJ1ZDWBDU3FC5TMZSCHZWSDQMV1ZZAIYD
XIUZOV
```

In [110]:
```
import requests

request_parameters = {
    "client_id": CLIENT_ID,
    "client_secret": CLIENT_SECRET,
    "v": '20180605',
    "section": "food",
    "near": "Manhattan",
    "radius": 2000,
    "limit": 100}

data = requests.get("https://api.foursquare.com/v2/venu
es/explore", params=request_parameters)
```

The next step is to transform data into JSON, a standardized format to transfer data as text that can be sent over a network. It represents objects as value pairs, just like a Python dictionary.

```
In [111]: d = data.json()["response"]
          d.keys()

Out[111]: dict_keys(['suggestedFilters', 'geocode', 'headerLocatio
          n', 'headerFullLocation', 'headerLocationGranularity',
          'query', 'totalResults', 'suggestedBounds', 'groups'])

In [112]: d["headerLocationGranularity"], d["headerLocation"], d
          ["headerFullLocation"]

Out[112]: ('city', 'Manhattan', 'Manhattan')

In [113]: d["suggestedBounds"], d["totalResults"]

Out[113]: ({'ne': {'lat': 40.79609717824817, 'lng': -73.9484474365
          6466},
            'sw': {'lat': 40.77045442008342, 'lng': -73.9853538321
          4212}},
           247)
```

After transforming data to Jason, it is time to request geocode and then create a group, including recommended information.

```
In [114]: d["geocode"]

Out[114]: {'what': '',
           'where': 'manhattan',
           'center': {'lat': 40.78343, 'lng': -73.96625},
           'displayString': 'Manhattan, NY, United States',
           'cc': 'US',
           'geometry': {'bounds': {'ne': {'lat': 40.882214, 'lng':
          -73.907},
             'sw': {'lat': 40.679548, 'lng': -74.047285}}},
           'slug': 'manhattan-manhattan-new-york-united-states',
           'longId': '72057594043053707'}
```

After creating items of objects, food, and their attributes, including uid, name, and location, we build the data frame using pandas. In order to visualize what we have got from our data as a beautiful map, I got coordinates of Manhattan, and for this regard, I used folium

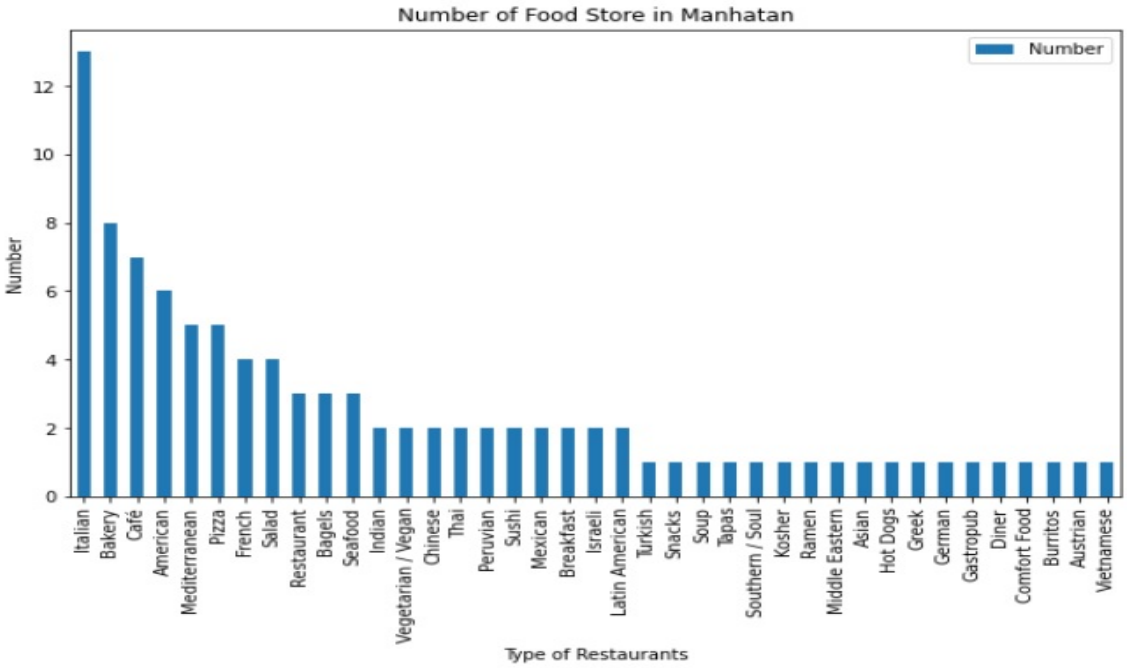
	uid	name	Type of Restaurant	address	postalcode	lat	lng
0	54419745498e8a6b5608301b	The Milling Room	American		10024	40.783531	-73.974295
1	4bc38504abf4952123e0c393	Bluestone Lane	Café		10128	40.783757	-73.958526
2	591890f43abcaf1ddca66e85	Ashoka	Indian		10024	40.784842	-73.973253
3	57d21135498ee7584bdc048a	Motorino	Pizza		10024	40.785586	-73.972842
4	49fa2837f964a520cf6d1fe3	Café Sabarsky	Austrian		10028	40.781445	-73.960385

In [128]:
```
Manhattan= d["geocode"]["center"]
Manhattan
```

Out[128]: {'lat': 40.78343, 'lng': -73.96625}

In [129]:
```
from folium import plugins


map_Manhattan = folium.Map(location=[40.78343, -73.96625], zoom_start=13)

def add_markers(df):
    for (j, row) in df.iterrows():
        label = folium.Popup(row["name"], parse_html=True)
        folium.CircleMarker(
            [row["lat"], row["lng"]],
            radius=5,
            popup=label,
            color='red',
            fill=True,
            fill_color='#3186cc',
            fill_opacity=0.7,
            parse_html=False).add_to(map_Manhattan)

add_markers(df)
hm_data = df[["lat", "lng"]].to_numpy().tolist()
map_Manhattan.add_child(plugins.HeatMap(hm_data))

map_Manhattan
```

Now our data is ready, but it needs to be more organized. For this regard, I used groupby for "Type of Restaurant." And then removed unnecessary columns by drop and sorted the results from highest number to lowest. And plot the bar chart based on the dataset.



Conclusion

As I mentioned before, food has a significant impact on tourism attraction, and the results of this research show different cousins in Manhattan, one of the biggest tourism centers. From the results, we will find that the top five food in Manhattan is Italian cuisine, Bakery, Café, American and Mediterranean cuisine, respectively. Pizza and French cuisine come next. Therefore, it can be concluded that Italian foods are the most favorite food in Manhattan, and it can be considered as the most successful food industry in the region.