Coursera Capstone Project: Battle of Neighborhoods

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1. Introduction

Bangalore is the largest and the capital city of the state of Karnataka, India. Touted as the 'Garden City' for its beautiful parks and green landscapes, it is now regarded as one of the largest IT hubs in the country. This boom in the information technology industry has garnered immense revenues and in addition to that, has also led to the growth of various other industries which includes the organized food service market, one of the largest services in the country after retail and insurance.

As revealed by the latest NRAI India Food Services Report, Bangalore's food service market stands third, at INR 20,014 Crores (2.8 Billion USD), among other major metropolitan cities in India. The average expenditure per month per household on eating out is INR 3,586 in Bengaluru, which is higher than the national average of INR 2,500. The city has approximately 42,000 restaurants and employs over one lakh people. The growth of Bengaluru's food service industry has been accredited to the cosmopolitan culture and IT sector jointly sparking a revolution in the eating and cooking habits of the residents.

Various neighborhoods in Bangalore are slowly becoming hotspots for culinary indulgences and for a person looking to open a food joint or a café, making an informed decision is necessary to reap maximum benefits in terms of customer loyalty and revenue. As too many neighborhoods are vastly commercializing their spaces, it is quite difficult for a potential café owner to decide on an optimal location and hence, a quantitative approach is needed to choose the right location.

2. Business Problem

Bangalore has been lauded for embracing the start-up culture and various notable start-ups have thus originated here ever since. This also means potential start-ups that are yet to make it big struggle to rent office space and most of their collaborations are done ad-hoc. This is where the quaint cafes the city has to offer save the day. This also explains the sudden surge in the number of cafes in certain neighborhoods that have IT offices or office spaces up for rent. Neighborhoods that border around major IT hubs of the city are also not far behind – one can see numerous food joints spread across these neighborhoods and being profitable. The main aim of this project is to find such ideal spots across the city to open a café or a restaurant and gain maximum profit by catering to the needs of the demographic discussed above.

3. Data

Data for this project has been obtained through three major sources as discussed below.

3.1 List of neighborhoods

The list of neighborhoods in Bangalore was obtained by Web Scraping a Wikipedia page. This was accomplished through a Python library called BeautifulSoup and later stored as a csv file.

```
source = requests.get('https://en.wikipedia.org/wiki/Category:Neighbourhoods_in_Bangalore').text
soup = BeautifulSoup(source, 'lxml')
file = open('bangalore.csv', 'w')
csv_writer = csv.writer(file)
csv_writer.writerow(['Neighbourhood'])
mwcg_grps = soup.find_all(class_ = "mw-category-group")

length = len(mwcg_grps)

for i in range(1, length):  # Iterating through all neighborhoods
    lists = mwcg_grps [i].find_all('a')
    for list in lists:
        nbd = list.get('title') # Name of the neighbourhood
        csv_writer.writerow([nbd])
file.close()
df = pd.read_csv('bangalore.csv')
```

3.2 Latitudes and longitudes

The comprehensive mapping of latitudes and longitudes of all the neighborhoods was accomplished through Nominatim Geocoding API. This data was later stored in a pandas Dataframe.

```
latitudes = []
longitudes = []

for nbd in df["Neighbourhood"] :
    address = nbd
    geolocator = Nominatim(user_agent="blr_explorer")

    location=geolocator.geocode(address)
    print(location)
    if location!= None:
        lat = location.latitude
        lng = location.longitude

    latitudes.append(lat)
    longitudes.append(lng)
```

3.3 Venue Details

The Dataframe containing the neighborhoods and their locations is used to obtain the details of venues in that neighborhood. This was done using Foursquare API after creating a developer account which allows for a limited number of free API calls per day. Below is the dataset after obtaining location and venue data for the list of neighborhoods.

	Neighbourhood	Neighbourhood Latitude	Neighbourhood Longitude	Venue Name	Venue Category	Venue Latitude	Venue Longitude
0	Adugodi	12.942847	77.610416	PVR IMAX	Movie Theater	12.934595	77.611321
1	Adugodi	12.942847	77.610416	Lot Like Crêpes	Creperie	12.936421	77.613284
2	Adugodi	12.942847	77.610416	Zingron - Naga Kitchen	Indian Restaurant	12.936271	77.615051
3	Adugodi	12.942847	77.610416	Koramangala Social	Lounge	12.935518	77.614097
4	Adugodi	12.942847	77.610416	Tommy Hilfiger	Clothing Store	12.934552	77.611347