

Battle of Neighbourhoods

1. Introduction/Business Problem

About the tourist place - KANYAKUMARI,INDIA

Kanyakumari is a coastal town in the state of Tamil Nadu on India's southern tip. Jutting into the Laccadive Sea, the town was known as Cape Comorin during British rule and is popular for watching sunrise and sunset over the ocean. This is also a historic place. Some historic sights that one can visit in Kanyakumari include the Padmanabhapuram Palace, the Vattakottai Fort, and the Gandhi Memorial.

Business Problem : Opening of Hotel/Restaurant

Now my business problem is, I would like to open a hotel/restaurant near beach side. As it is a famous tourist spot, there is already lots of attention towards it. I know there will be many competitors in terms of hotel and restaurant. But keeping them in mind, I need to locate my hotel in place where more people are attracted and comfortable for a stay and a good meal. I want to bring foreigners and as well as local people's attention towards my new hotel. I would like to flavour my restaurant recipe with Italian, American, typical south & north Indian foods taste.

The challenge is to find a suitable location for opening a new hotel / restaurant attracted to all local and foreign people in the centre of all famous venues.

Target / Interested Audiences:

Almost 7.5 Million people visit Kanyakumari in each year, which is also growing. Out of which 85% local and 15% foreigners. Some people stay for a couple of days or more. Also they find some place for hangout or a good meal. Their main focus might be belonging to stay somewhere near to beach & historic venues. Apart from these set of people, students and working professionals are also common audience here.

2. Data Section:

a.What Data is being used?

We will be completely working on Foursquare data to explore and try to locate our new hotel where more venues like church, temples, beach, museums, memorials that are present nearby.

How will we be solving using this data?

We will looking for midpoint area of venues to locate our new hotel.Before that our major focus will be on all venues present in and around the core place of kanyakumari.

Just a heads up on how many hotels are distributed now around kanyakumari.We will perform some EDA on hotels & restaurants present in the tourist spot.On furthur notebook we will use Foursquare data to determine other venues as well.

b.Importing Libraries:

Solving environment: done

Package Plan

environment location: /opt/conda/envs/Python36

added / updated specs:

- geopy

The following packages will be downloaded:

package	build		
python_abi-3.6	1_cp36m	4 KB	conda-forge
openssl-1.1.1g	h516909a_0	2.1 MB	conda-forge
geographiclib-1.50	py_0	34 KB	conda-forge
certifi-2020.4.5.2	py36h9f0ad1d_0	152 KB	conda-forge
ca-certificates-2020.4.5.2	hecda079_0	147 KB	conda-forge
geopy-1.22.0	pyh9f0ad1d_0	63 KB	conda-forge
Total:		2.5 MB	

The following NEW packages will be INSTALLED:

geographiclib:	1.50-py_0	conda-forge
geopy:	1.22.0-pyh9f0ad1d_0	conda-forge
python_abi:	3.6-1_cp36m	conda-forge

The following packages will be UPDATED:

ca-certificates:	2020.1.1-0	--> 2020.4.5.2-hecda079_0	conda-forge
certifi:	2020.4.5.1-py36_0	--> 2020.4.5.2-py36h9f0ad1d_0	conda-forge
openssl:	1.1.1g-h7b6447c_0	--> 1.1.1g-h516909a_0	conda-forge

Downloading and Extracting Packages

python_abi-3.6	4 KB	#####	100%
openssl-1.1.1g	2.1 MB	#####	100%
geographiclib-1.50	34 KB	#####	100%
certifi-2020.4.5.2	152 KB	#####	100%
ca-certificates-2020	147 KB	#####	100%
geopy-1.22.0	63 KB	#####	100%

Preparing transaction: done
Verifying transaction: done
Executing transaction: done
Solving environment: done

Package Plan

environment location: /opt/conda/envs/Python36

added / updated specs:
- folium=0.5.0

The following packages will be downloaded:

package	build		
-----	-----		
branca-0.4.1	py_0	26 KB	conda-forge
folium-0.5.0	py_0	45 KB	conda-forge
altair-4.1.0	py_1	614 KB	conda-forge
vincent-0.4.4	py_1	28 KB	conda-forge
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Total:		713 KB	

The following NEW packages will be INSTALLED:

altair: 4.1.0-py_1 conda-forge
branca: 0.4.1-py_0 conda-forge
folium: 0.5.0-py_0 conda-forge
vincent: 0.4.4-py_1 conda-forge

Downloading and Extracting Packages

branca-0.4.1	26 KB	#####	100%
folium-0.5.0	45 KB	#####	100%
altair-4.1.0	614 KB	#####	100%
vincent-0.4.4	28 KB	#####	100%

Preparing transaction: done
Verifying transaction: done
Executing transaction: done
all library imported

c. The Core location

Kanyakumari location : 8.079252,77.5499338

d. Search for hotel & restaurant within 1 KM

Send the GET Request of hotel & restaurants and examine the results

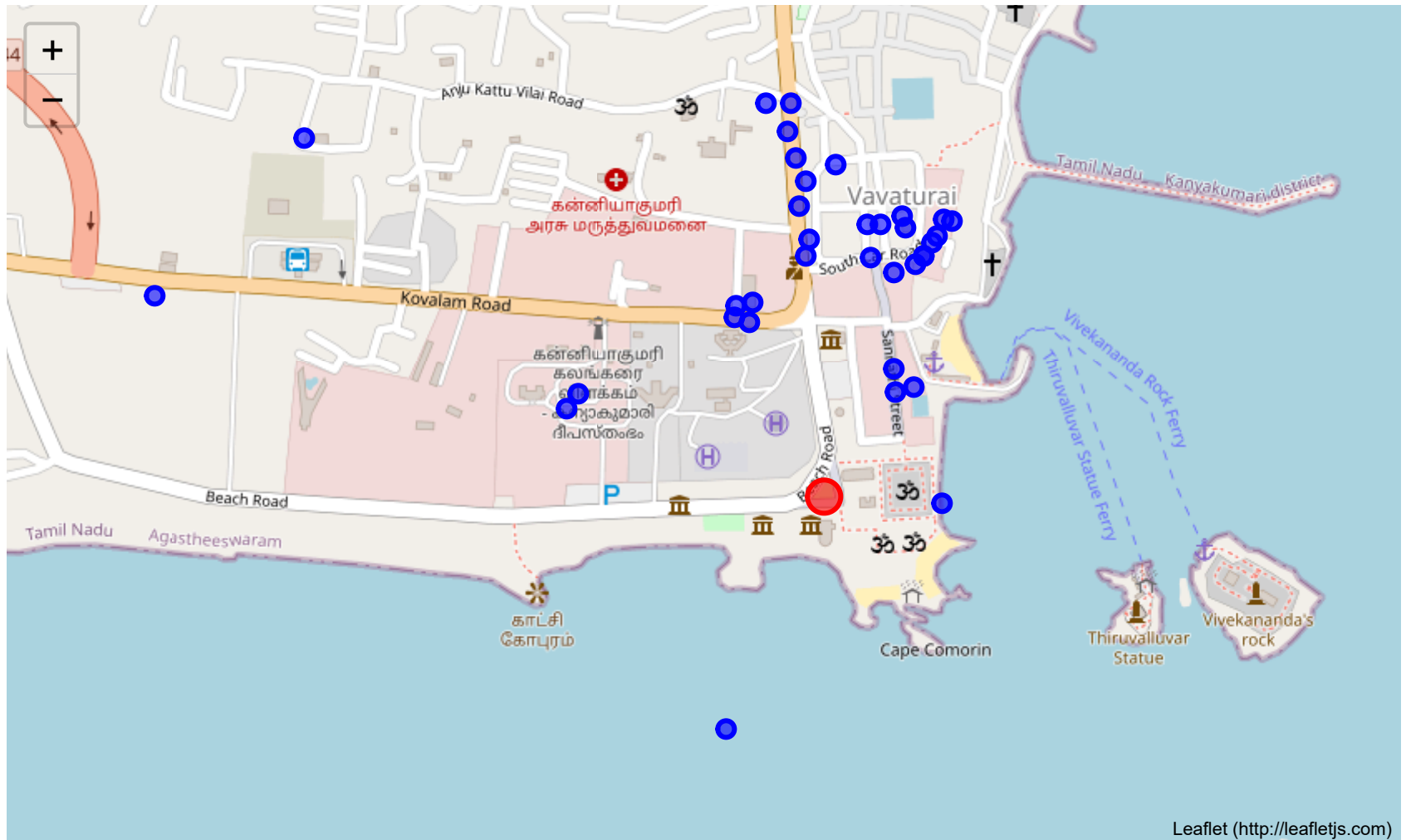
Get relevant part of JSON and transform it into a pandas dataframe

There are 38 restaurants and hotels at Kanyakumari

Define information of interest and filter dataframe

	name	categories	distance	lat	Ing	id
0	Hotel SeaView	Hotel	371	8.082333	77.551217	4cd42e2c558a370412d0c5a6
1	Hotel Sarvana	Hotel	179	8.080581	77.550861	4db052544df03036e8b9d615
2	Hotel Annapoorna	Indian Restaurant	206	8.080879	77.550835	50ed3a39e4b0ac50005eb3f1
3	Hotel Samudra	Motel	201	8.080642	77.551102	4d3c66e414aa8cfa4641a95e
4	Hotel Trisea	South Indian Restaurant	269	8.081475	77.548969	5030a43ee4b021f7a59c7456

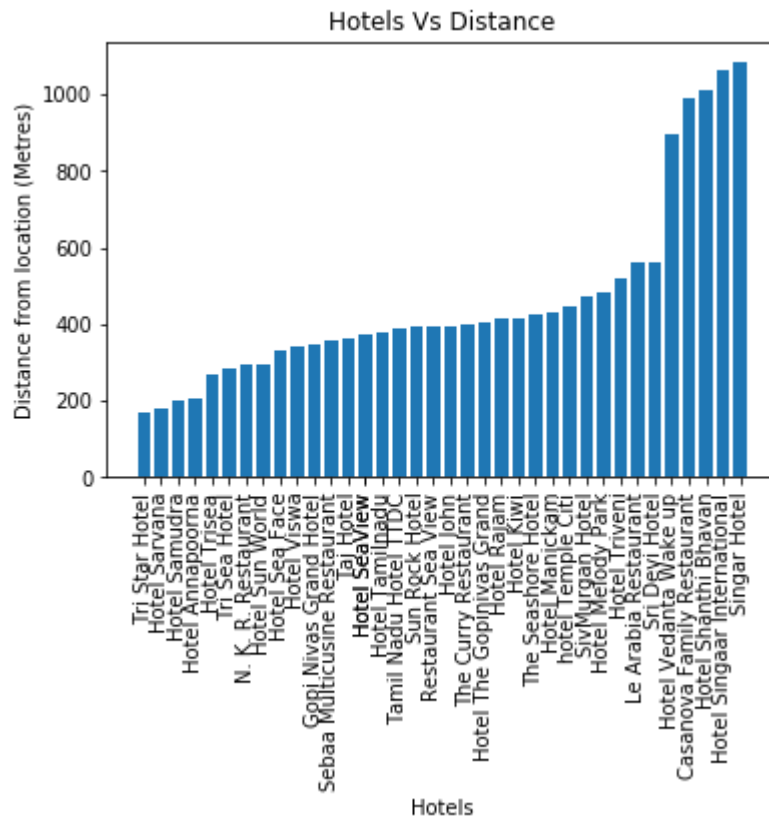
e. Location of Hotels on Map



3.Methodology section

a.How Far are hotels from the core location?

So Now there are 37 hotels & restaurants present in kanyakumari



Average distance between hotels and core location is 457 metres

Take Aways

1. Singar hotel is the most far from the core spot.
2. Tri Star closeest to the core spot.
3. 457 metres is average distance from all hotels to core location.

c. Explore for other venues around Kanyakumari (within 1 km of the core spot)

'There are 17 venues around kanyakumari.'


```

0           Sunrise Point
1   Vivekananda Rock Memorial
2           End of the Land
3           Kanyakumari Beach
4           Triveni Sangam
5           Sparsa Resorts and Spa
6           Hotel SeaView
7           Sangam Restautant
8           Gandhi Memorial
9           Hotel Sarvana
10          Thiruvalluvar Statue
11          Ferry Boat
12   Watch Tower, Kanyakumari
13   Kanyakumari Lighthouse
14   The Seashore Hotel
15   Kanyakumari Bus Stantion
16   Thiruvalluvar Mandapam
Name: name, dtype: object

```

d. Adding missing venues using single queries

	name	categories	distance	lat	lng	id
0	Bhagwati Aman Temple	Temple	127	8.079735	77.550979	4c7110d8d7fab1f7733e60c9
1	Kanyakumari Temple	Temple	209	8.080701	77.551147	5135e0ace4b05b6ad7b6e450
2	hotel Temple Citi	Hotel	448	8.083273	77.549709	58b591732520ae2198572be8
3	Guganateeswara Temple	Temple	891	8.087151	77.548584	59361f0fd48ec1757c7d4ca4
0	St.Anthony's Church	Church	435	8.082916	77.551320	4db2dc880437fa536a056d3e
1	Our Lady Of Ransom Church	Church	680	8.085158	77.551544	4edb6b300e011b46ef9c3af5
0	Triangle Park	Park	8	8.079332	77.549930	5a17c667f96b2c105e79a65e
1	Hotel Melody Park	Hotel	482	8.083571	77.549568	52fbace0498e429e952167c7

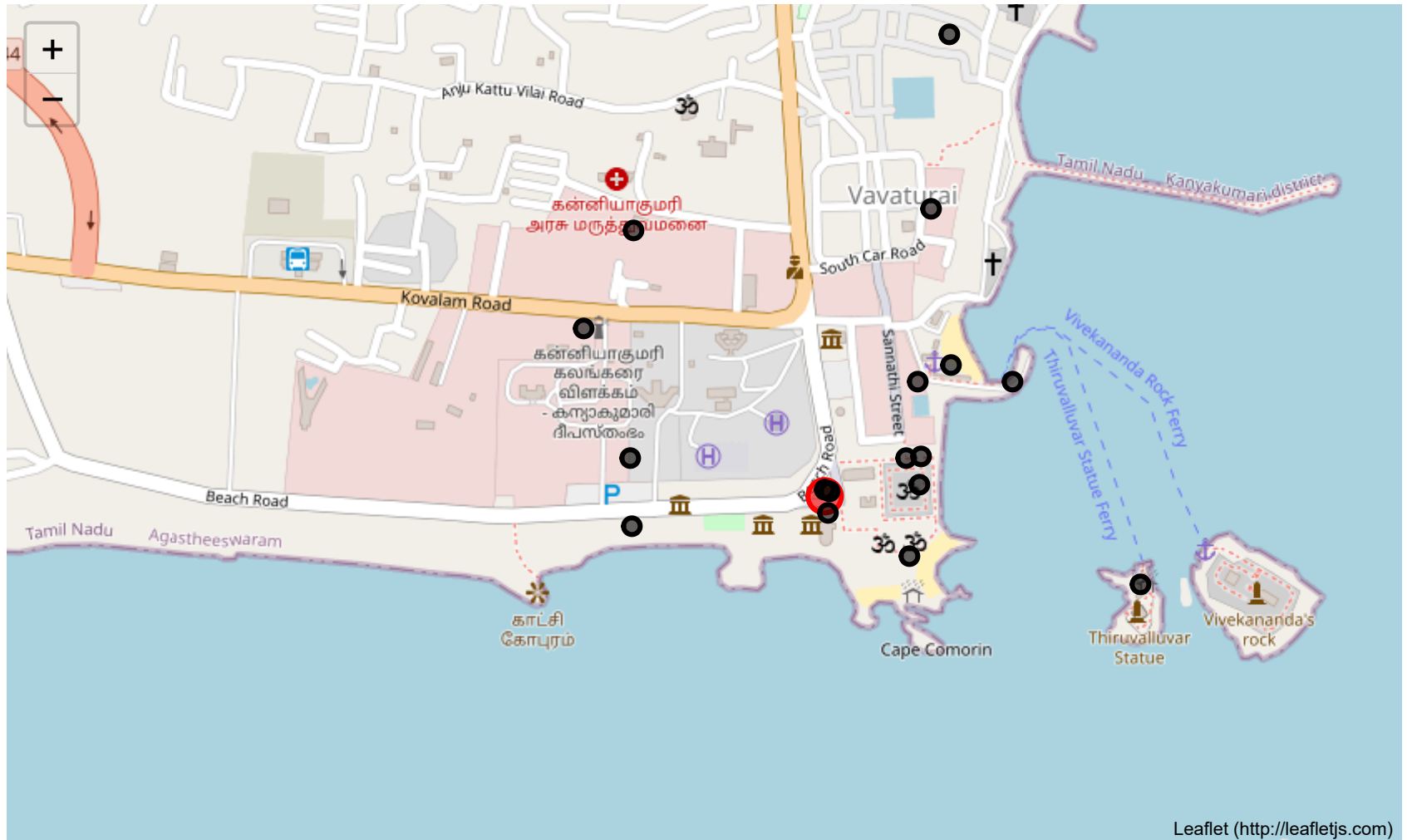
e. Final list of venues

We will add our single queries venue to the list, also will delete any hotel/restaurent from the venue list.

There are 18 venues in kanyakumari

	name	distance	id
0	Sunrise Point	135	4f21fd64e4b0717a65eeddc3
1	Vivekananda Rock Memorial	312	4b9cbc7ef964a520e37836e3
2	End of the Land	148	4f22babfe4b0ed339695e61e
3	Kanyakumari Beach	10	4e8d9f944fc653e47d1afef1
4	Triveni Sangam	277	4eb57ae40cd688257829927c
5	Gandhi Memorial	26	4e8d8fc94fc653e47d19524a
6	Thiruvalluvar Statue	147	4ed9ed9530f83fb79c10cd14
7	Ferry Boat	259	4c71df7857b6a1436f4ec4cc
8	Watch Tower, Kanyakumari	281	4ce8e6589f776ea8dbf96022
9	Kanyakumari Lighthouse	417	4c711c4334443704e6f5255f
10	Kanyakumari Bus Stantion	465	4edc1b4846907c1b44ba0ed8
11	Thiruvalluvar Mandapam	466	4cc0142397bc721ec6178967
12	Bhagwati Aman Temple	127	4c7110d8d7fab1f7733e60c9
13	Kanyakumari Temple	209	5135e0ace4b05b6ad7b6e450
14	Guganateswara Temple	891	59361f0fd48ec1757c7d4ca4
15	St.Anthony's Church	435	4db2dc880437fa536a056d3e
16	Our Lady Of Ransom Church	680	4edb6b300e011b46ef9c3af5
17	Triangle Park	8	5a17c667f96b2c105e79a65e

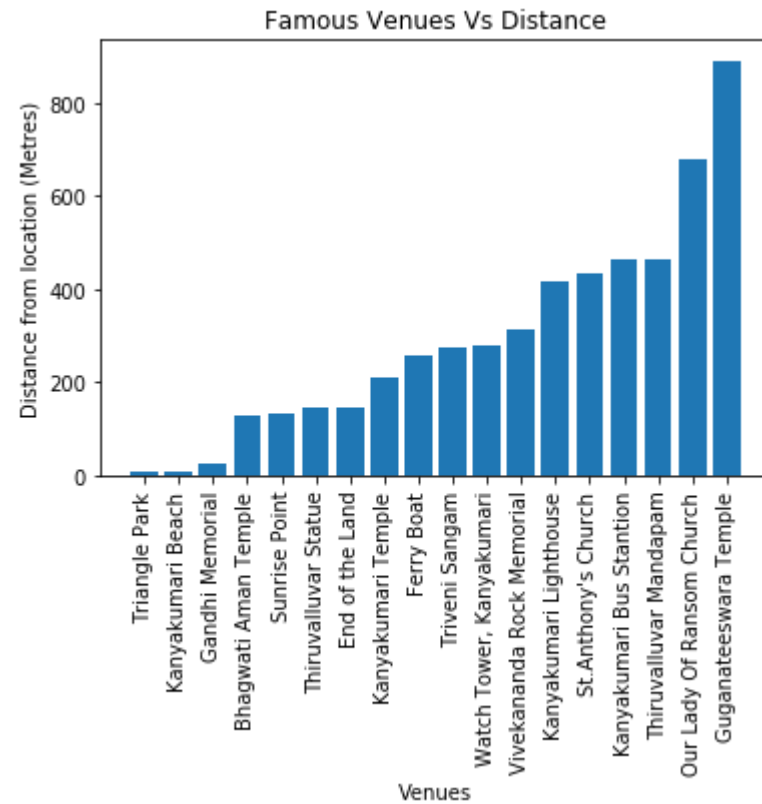
f. Location of all venues on Map



All venues seems to be dispersed except seashore areas.

We have enlisted total of hotels/Restaurants and venues around kanyakumari(1 km from the core area).There are 37 Hotels/Restaurant and 18 Venues.

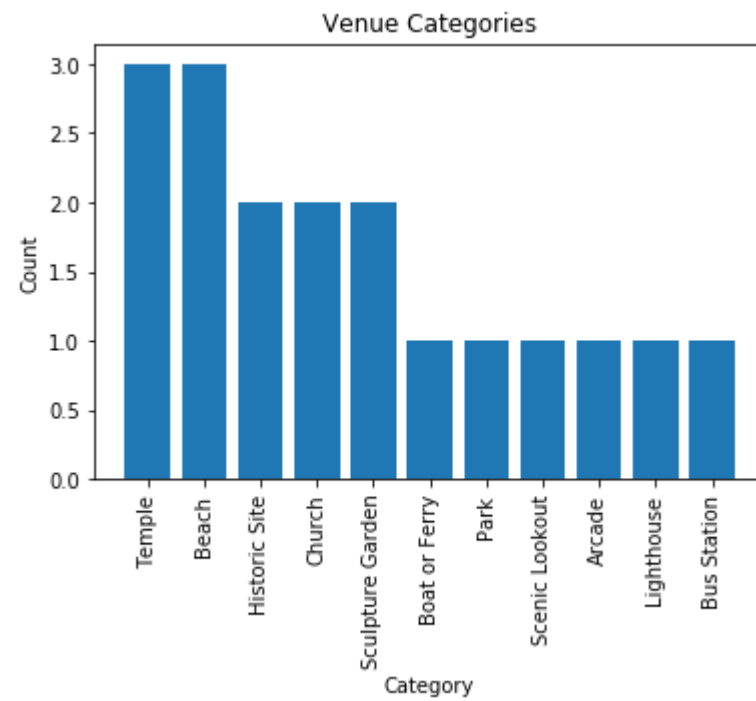
g.Distances of venues from the core location?



Take Aways

1. Kanyakumari beach,Gandhi Memorial,Triangle Park are closest to our location.
2. Gunganateswara temple is the most far venue.
3. Bus station is also an important venue which is within 500 metres from our location

h. Venue Categories?



Rating of all Venues:

	Venue	Rating	distance in mtr
0	Sunrise Point	8	135
1	Vivekananda Rock Memorial	8.1	312
2	End of the Land	7.5	148
3	Kanyakumari Beach	7.2	10
4	Triveni Sangam	7	277
5	Gandhi Memorial	5.6	26
6	Thiruvalluvar Statue	No Rating Yet	147
7	Ferry Boat	No Rating Yet	259
8	Watch Tower, Kanyakumari	No Rating Yet	281
9	Kanyakumari Lighthouse	No Rating Yet	417
10	Kanyakumari Bus Stantion	No Rating Yet	465
11	Thiruvalluvar Mandapam	No Rating Yet	466
12	Bhagwati Aman Temple	No Rating Yet	127
13	Kanyakumari Temple	No Rating Yet	209
14	Guganateswara Temple	No Rating Yet	891
15	St.Anthony's Church	No Rating Yet	435
16	Our Lady Of Ransom Church	No Rating Yet	680
17	Triangle Park	No Rating Yet	8

j. Extracting most rated and crowded Venues

	Venue	Rating	distance in mtr	Tips
0	Sunrise Point	8	135	4
1	Vivekananda Rock Memorial	8.1	312	16
2	End of the Land	7.5	148	2
3	Kanyakumari Beach	7.2	10	3
4	Triveni Sangam	7	277	1
5	Gandhi Memorial	5.6	26	2
6	Ferry Boat	No Rating Yet	259	4
7	Watch Tower, Kanyakumari	No Rating Yet	281	1
8	Kanyakumari Lighthouse	No Rating Yet	417	1
9	Kanyakumari Bus Stantion	No Rating Yet	465	1

k. Final list of Venues(according to our interest)

	index	categories	distance	id	lat	lng	name
0	0	Beach	135	4f21fd64e4b0717a65eeddc3	8.079398	77.551158	Sunrise Point
1	1	Sculpture Garden	312	4b9cbc7ef964a520e37836e3	8.080707	77.552362	Vivekananda Rock Memorial
2	2	Arcade	148	4f22babfe4b0ed339695e61e	8.078479	77.551035	End of the Land
3	3	Beach	10	4e8d9f944fc653e47d1afef1	8.079311	77.550005	Kanyakumari Beach
4	4	Historic Site	277	4eb57ae40cd688257829927c	8.078860	77.547448	Triveni Sangam
5	8	Historic Site	26	4e8d8fc94fc653e47d19524a	8.079021	77.549976	Gandhi Memorial
6	11	Boat or Ferry	259	4c71df7857b6a1436f4ec4cc	8.080931	77.551561	Ferry Boat
7	12	Beach	281	4ce8e6589f776ea8dbf96022	8.079731	77.547430	Watch Tower, Kanyakumari
8	13	Lighthouse	417	4c711c4334443704e6f5255f	8.081389	77.546820	Kanyakumari Lighthouse
9	15	Bus Station	465	4edc1b4846907c1b44ba0ed8	8.082652	77.547469	Kanyakumari Bus Stantion

I. Clustering based on venues (To find our area of interest for new Hotel)

Now lets do some prediction to locate our new hotel in centre of final list of venues

	name	Arcade	Beach	Boat or Ferry	Bus Station	Historic Site	Lighthouse	Sculpture Garden
0	Sunrise Point	0	1	0	0	0	0	0
1	Vivekananda Rock Memorial	0	0	0	0	0	0	1
2	End of the Land	1	0	0	0	0	0	0
3	Kanyakumari Beach	0	1	0	0	0	0	0
4	Triveni Sangam	0	0	0	0	1	0	0


```
KMeans(algorithm='auto', copy_x=True, init='k-means++', max_iter=300,
       n_clusters=3, n_init=10, n_jobs=None, precompute_distances='auto',
       random_state=0, tol=0.0001, verbose=0)
```

m. Center & Midpoints of all clusters & all top venues

Most preferable location (Green Dot in our below given map) of our brand new hotel should be :8.079899388854393,77.54944512303567



4.Results section

4.a Most preferable location for New Hotel:

1. Location : 8.07985,77.54973, is the most preferable location in Kanyakumari Core Area, for New Hotel, from business point of view.
2. This location/area is at Beach Road opposite to Gandhi Memorial and Kumari Temple.
3. From business point of view this location is optimum.

4.b Top Rated Venues in Kanyakumari:(which are crowded also the nearest)

1.Sunrise Point

2.Vivekananda Rock Memorial

3.End of the Land

4.Kanyakumari Beach

5.Triveni Sangam

6.Gandhi Memorial

4.c Plot my hotel map against others Hotels & Top Venues:

Green - My hotel location

Red - Kanyakumari core location.

Black - Venues.

Blue - Other hotels.

5. Conclusion

1. As a business person, I would like to open my new restaurant/Hotel in the nearest area of the suggested point. Because this area is nearest to the core area, nearest to the top rated venues, also nearest to the crowded places where tourists roam around.
2. This same principal can give us an idea of any kind of unexplored business areas.

My Experience with IBM:

It was a wonderful journey with IBM capstone and other courses.