

# PREDICTING LOCATION FOR OPENING NEW HOTEL

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## 1. Introduction/Business Problem

I am from kanyakumari, a beautiful tourist spot in southern 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. Kanyakumari is also home to the Statue of the Saint Poet Thiruvalluvar, one of the greatest Tamil poets in India. Standing at a massive height of 133 feet, the statue is one of the biggest in the entire Asian subcontinent and is the result of the hard work of over 500 sculptors. Another historic site that you can visit in Kanyakumari include the Padmanabhapuram Palace, the Vattakottai Fort, and the Gandhi Memorial.

## Opening of Hotel/Restaurant Shop

Coming down to business problem, 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 foreign and local people attention towards my new hotel. I would like to flavor my restaurant recipe with Italian, American, typical south & north Indian foods to grab their taste.

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

## Expected / Interested Audience

85% local and 15% foreign peoples visit kanyakumari once in a year. Some people stay for 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 reach venues. Apart from these set of people, students and working professionals are common audience here. So we may need to fascinate them all.

## 2. Data section

### 2.a What data is 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 look for midpoint area of venues to locate our new hotel. Firstly, 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 further notebook we will use Foursquare data to determine other venues as well.

	name	categories	distance	lat	lng	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

Fig 1. Hotel and Restaurant within 1 Km

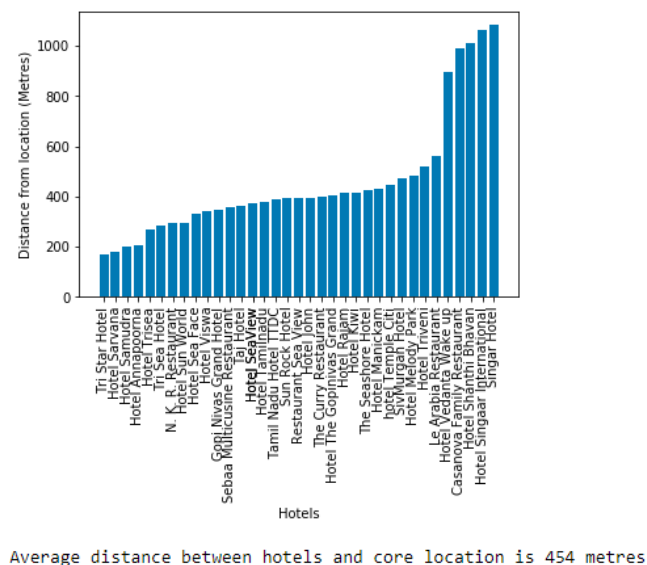


Fig 2. Avg. distance between hotel and nearby venue

### 3. Exploratory Data Anaysis

When I searched in google map,I could see there were some venues missing.Temples,Church,Parks and Museums are also more recognized by visitors and local audience.So lets bring their data inside.I am not sure why Foursquare hasnt captured it while trying venue query.

	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

Fig 3. Avg. Missing venues that Foursquare did not capture

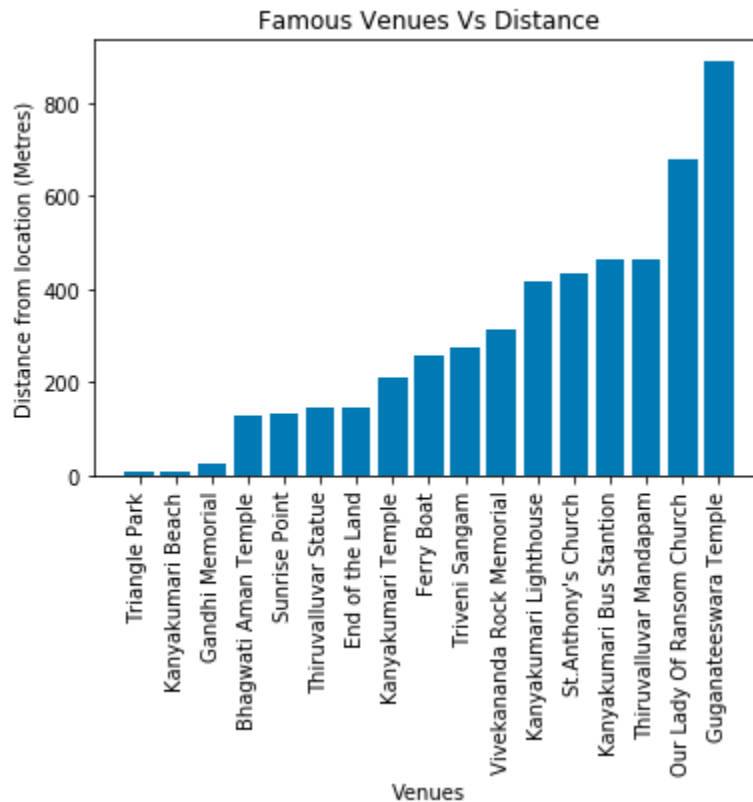


Fig 4. Famous venues

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	10	Boat or Ferry	259	4c71df7857b6a1436f4ec4cc	8.080931	77.551561		Ferry Boat
6	11	Historic Site	26	4e8d8fc94fc653e47d19524a	8.079021	77.549976		Gandhi Memorial
7	12	Lighthouse	417	4c711c4334443704e6f5255f	8.081389	77.546820		Kanyakumari Lighthouse
8	15	Bus Station	465	4edc1b4846907c1b44ba0ed8	8.082652	77.547469		Kanyakumari Bus Stantion

Fig 5. Famous venues (Rating, Location, Avg. Distance)

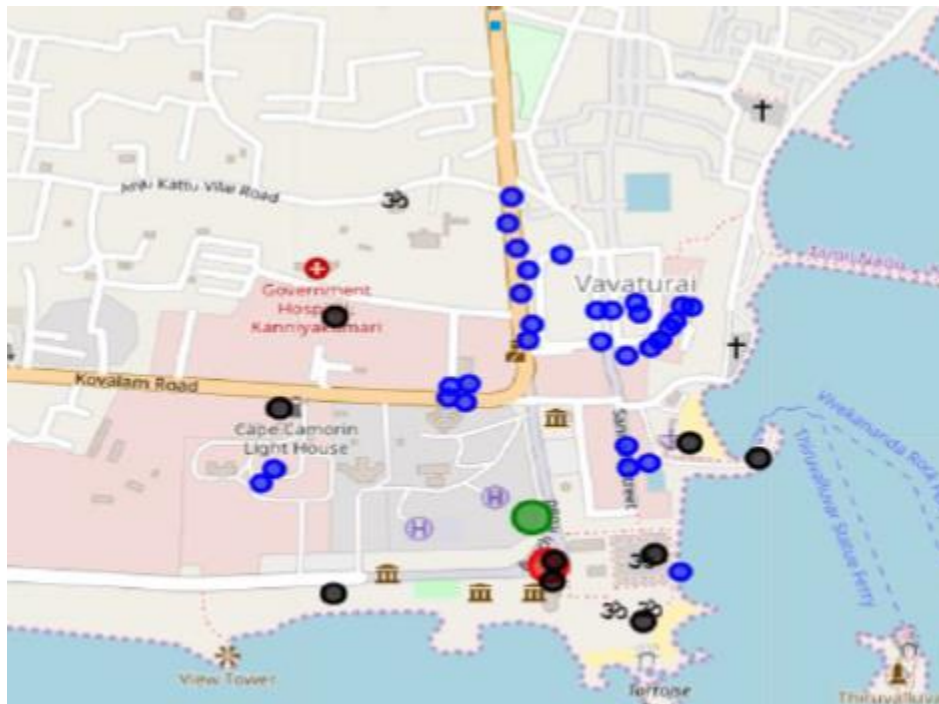


Fig 6. Final location (Green Dot in our below given map) of our brand-new hotel

**The location gives the central point to visit all other venues.Hence this can be locked down to attract all tourist.**

## 4. Results section

### 4.a My hotel location

- Final location is pointed at **8.07985,77.54973**
- This location is at **Beach Road opposite to Gandhi Memorial and Kumari Temple.**
- Located at exact junction of two cross roads which can give more attention to people who pass by.

### 4.b Top Rated Venues

- Sunrise Point
- Vivekananda Rock Memorial
- End of the Land
- Kanyakumari Beach
- Triveni Sangam
- Gandhi Memorial

All these venues are rated well than other and also, they have more tips and located within 320 meters to core location of kanyakumari. So, tourists may like to visit these places.

### 4.c Spot my hotel against others

- Green - My hotel location
- Red - Kanyakumari core location.
- Black - Venues.
- Blue - Other hotels.
- My predicted location and core location are very close to each other which is expected. As this has central attraction, the predicted one almost matched with the core.

### 4.d Few more Stats

- Most common categories of venues are **Temples, Church, Beach** in Kanyakumari
- Average distance between all hotels is **454 meters**.
- **Tri Star Hotel, Hotel Saravana, Hotel Samudra** will be our competitors as they stay close to our predicted location.

## **5. Discussion section**

From above reports, we could get an idea why the predicted one is pointed/clustered on the given spot. First most thing could be the center of attraction for the place.

KMeans have figured out the most common place for all the venues. This output was very adjacent to the core location. This proves the accurate spotting of our predicted algorithm.

Despite of the findings, there were some lack in data. Tips and ratings were missing for most of the venues. Also when I compared foursquare data with google map ,i could see there were many hotels and venues found missing in foursquare.

## **6. Conclusion section**

As a business person, one would be able to set up a hotel/restaurant on given spot. This will bring revenue automatically as we have located in very near to core one. We proved this with Kmeans.

### **Future Expectation:**

As mentioned earlier, most of data needs to be extracted from google maps. Even though we got somewhat accurate prediction. To be very confident on concluding our output, we may need more data to analyze.

Research based on hotel reviews and restaurant menus could be used for future purpose.

### **My Experience:**

*It was wonderful journey for me in IBM capstone and other courses. It can aid to layman people as well who don't know a pinch of Data science. Thanks to Coursera for keeping skillful instructors with their awesome materials*