

# Exploring Dubai

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## 1. Introduction

### 1.1 Background

**Tourism in Dubai** is a part of the Dubai government's strategy to maintain the flow of foreign cash into the emirates. In May 2013, the government of Dubai launched the Dubai Tourism Strategy 2020, with the key objective to attract 20 million visitors a year by 2020 and making Dubai a first choice destination for international leisure travelers as well as business travelers. In 2018, the strategy was expanded by setting new goals of attracting 21-23 million visitors in 2022 and 23-25 million visitors by 2025.

Dubai's lure for tourists is based mainly on shopping, but also on its possession of other ancient and modern attractions. (Wikipedia, 2021)

### 1.2 Problem

There are many attraction sites in Dubai, a visitor should plan his trip to Dubai in order to see and enjoy most of the astonishing venues in Dubai in a short visit, therefore, in this study, we will help the visitor to choose where to spend his time in Dubai by defining the surrounding venues that are located near the most popular landmarks in Dubai, for example, Burj Khalifa is the longest skyscraper in the world, it is surrounded by many attractive places, also The Walk of JBR, it is a unique area in Dubai, so if you're a tourist you will need to decide which one of these places will have more attractive sites and places, so that you can give more priority to visit the chosen place.

### 1.3 Interest

Usually, tourists' visits are relatively short, on average it ranges from one week to 10 days, Dubai is a city that is designed to attract tourists from all over the world and it has many places to visit and activities to do, so the short visits of tourism should be well-planned to gain the most of the trip to Dubai, this study will demonstrate a comparison between four different places in Dubai.

## 2. Data acquisition

To make our trial comparison we have chosen 4 places with their location coordinates, table below shows the structure of this source, the link for this list is found here:

[https://github.com/hazem1379/Coursera\\_Capstone/blob/337b0272b6ea83ead2fbb19ce453eaa1783b86de/Dubai\\_New.csv](https://github.com/hazem1379/Coursera_Capstone/blob/337b0272b6ea83ead2fbb19ce453eaa1783b86de/Dubai_New.csv)

1	Place	Latitude	Longitude
2	Burj Khalifa	25.20803823	55.26478854
3	Global Village	25.07370574	55.30712146
4	Dubai Airport	25.2526649	55.35469922
5	JBR	25.07810732	55.13660532

The main data for the details around the 4 places that appear on the above table are acquired using foursquare.com API, we will get the surrounding venues information using the latitude and longitude information that appears in the table.

## 3. Methodology

**Step 1- Getting the data as describe above**

**Step 2 - Location Placement on the map of Dubai**

# Localise places on the map of Dubai

address = 'Dubai, AE'

geolocator = Nominatim(user\_agent="my-application")

location = geolocator.geocode(address)

latitude = location.latitude

longitude = location.longitude

print('The geographical coordinate of Dubai are {}, {}'.format(latitude, longitude))

**Step 3 - Create map of Dubai using latitude and longitude values**

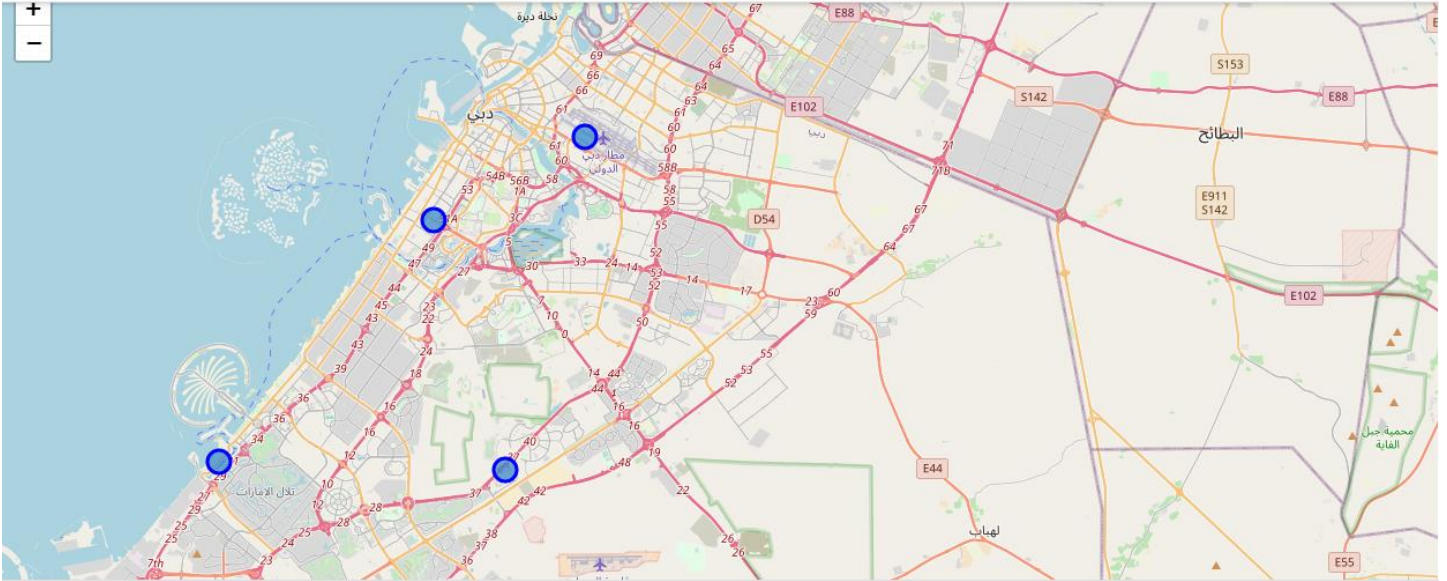


Figure 1: Map of Dubai with Markers of the fur selected places.

#### Step 4 - Create a function to explore the city (any city):

```
def getNearbyVenues(names, latitudes, longitudes, radius=500, LIMIT=200)
```

where name is the name of the place (example: Burj Khalifa),

latitudes, longitudes, the coordination for the place

radius=500, the radius around the place by meters,

LIMIT=200, number of calls to get from foursquare.com.

The function will return a list of venues that are located around the target place.

#### Step 5 – We check the rates of Venues

```
Venue : Burj Khalifa
This venue 9.2
Venue : Global Village
This venue 8.6
Venue : Dubai Airport
This venue 9
Venue : The Walk at JBR
This venue 9.5
```

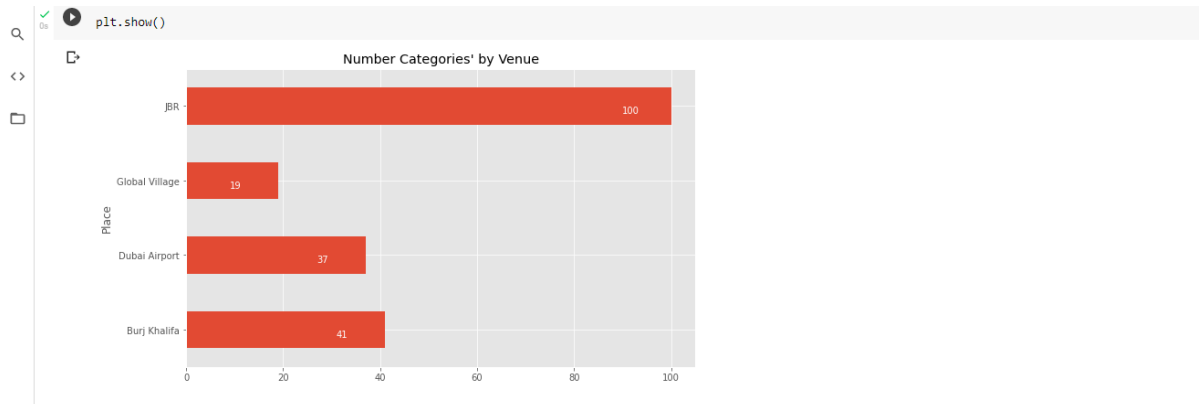
#### Step 6- Using foursquare API, we categories the venues around the four selected places.

	Place	PlaceLatitude	PlaceLongitude	Venue	Venue id	Venue Latitude	Venue Longitude	Venue Category
0	Burj Khalifa	25.208038	55.264789	The Roxy Cinemas	589dfabb84677a520fe72337	25.207183	55.263502	Movie Theater
1	Burj Khalifa	25.208038	55.264789	Urth Caffé (إيرث كافيه)	5bd0124b27cbd100253a33c0	25.208221	55.263431	Café
2	Burj Khalifa	25.208038	55.264789	Sarabeth's	58d1121d2433261703ba918	25.207246	55.265437	Breakfast Spot
3	Burj Khalifa	25.208038	55.264789	Mitts & Trays Restaurant and Cafe	57af45aecdd1064459f43df46	25.208034	55.262896	Restaurant
4	Burj Khalifa	25.208038	55.264789	The Roxy Cinema Director's Lounge	586e56629343e030f2d7ee08	25.207304	55.262945	Movie Theater
5	Burj Khalifa	25.208038	55.264789	Mattel Play Town	57495e2e498e31fbc59fa480	25.207725	55.262310	Indoor Play Area
6	Burj Khalifa	25.208038	55.264789	City Walk (سيتي ووك)	5268acfb498e429bde00775b	25.207284	55.262279	Shopping Plaza
7	Burj Khalifa	25.208038	55.264789	The Roxy Cinema Editor's Suite	58e54754db6cd626309fd00b	25.207153	55.263412	Movie Theater
8	Burj Khalifa	25.208038	55.264789	Hub Zero	54b5298a498eb7bad660bc95	25.206940	55.262489	Arcade

**Step 7 – We check how many venues around each of the four places.**

Count							
<pre># More interesting #Let's check how many venues were returned for each place dubai_data_venues.groupby('Place').count()</pre>							
	PlaceLatitude	PlaceLongitude	Venue	Venue id	Venue Latitude	Venue Longitude	Venue Category
Place							
Burj Khalifa	41	41	41	41	41	41	41
Dubai Airport	37	37	37	37	37	37	37
Global Village	19	19	19	19	19	19	19
JBR	100	100	100	100	100	100	100

**Step 8- We plot a Histogram to see the four places avenues.**



**Step 9- We will analyze categories for the venues around the four places which are under study, we will use one-hot-coding.**

	Place	Airport	Airport Lounge	Airport Service	American Restaurant	Arcade	Asian Restaurant	BBQ Joint	Bakery	Bar	Beach	Beach Bar	Bistro	Botanical Garden	Breakfast Spot	Burger Joint	Café	Caribbean Restaurant
0	Burj Khalifa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	Burj Khalifa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
2	Burj Khalifa	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
3	Burj Khalifa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	Burj Khalifa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	Burj Khalifa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	Burj Khalifa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

**Step 10 – We will group rows by Place, then we will calculate the mean of the frequency of occurrence of each category**

Dubai.ipynb

```

# let's group rows by Place
# and by taking the mean
dubai_grouped = dubai_onehot.groupby('Place').mean().reset_index()
dubai_grouped

```

	Place	Airport	Airport Lounge	Airport Service	American Restaurant	Arcade	Asian Restaurant	BBQ Joint	Bakery	Bar	Beach	Beach Bar	Bistro	Botanical Garden	Breakfast Spot	Burger Joint	Café	C Caribbean Restaurant
0	Burj Khalifa	0.000000	0.000000	0.000000	0.02439	0.04878	0.00	0.00	0.048780	0.024390	0.00	0.00	0.02439	0.02439	0.048780	0.048780	0.121951	
1	Dubai Airport	0.027027	0.135135	0.162162	0.00000	0.00000	0.00	0.00	0.027027	0.027027	0.00	0.00	0.00000	0.00000	0.027027	0.000000	0.054054	
2	Global Village	0.000000	0.000000	0.000000	0.00000	0.00000	0.00	0.00	0.000000	0.000000	0.00	0.00	0.00000	0.00000	0.000000	0.052632	0.000000	
3	JBR	0.000000	0.000000	0.000000	0.00000	0.00000	0.01	0.01	0.020000	0.020000	0.02	0.01	0.01000	0.00000	0.040000	0.030000	0.050000	

the top 10 most common venues

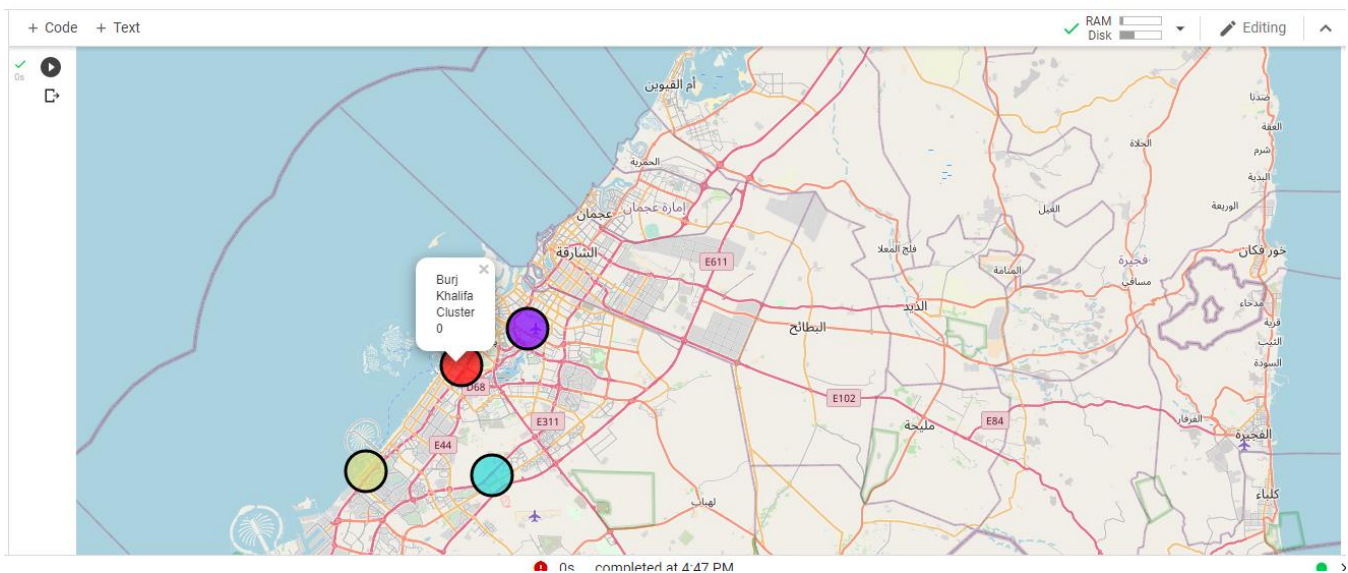
**Step 11- We calculate the most top frequent categories; the results are shown below:**

place\_venues\_sorted

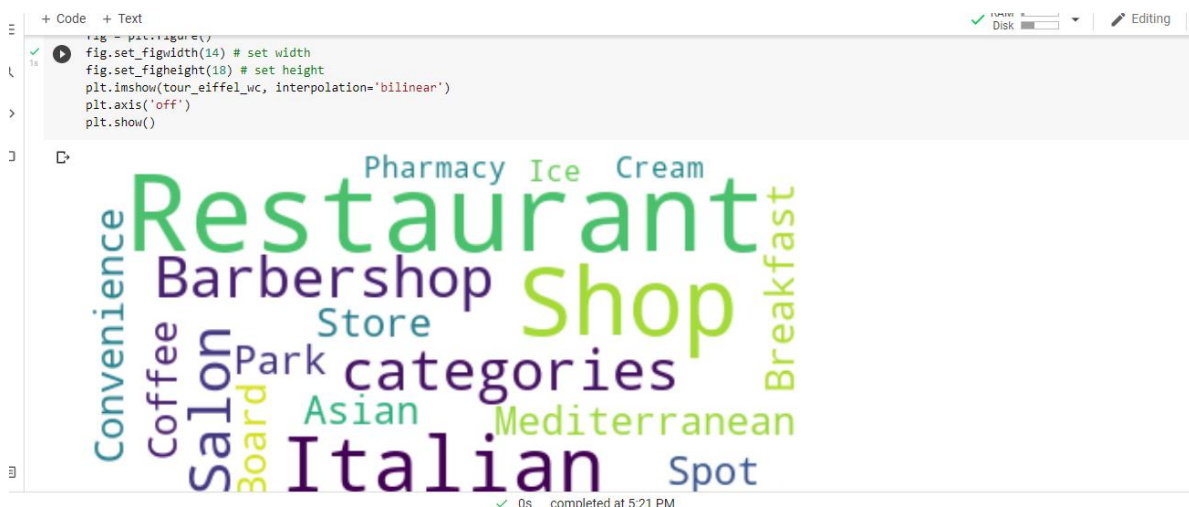
	Place	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0	Burj Khalifa	Café	Movie Theater	Coffee Shop	Arcade	Bakery	Toy / Game Store	Restaurant	Breakfast Spot	Burger Joint	Cosmetics Shop
1	Dubai Airport	Airport Service	Airport Lounge	Coffee Shop	Café	Sandwich Place	Fast Food Restaurant	Middle Eastern Restaurant	Rental Car Location	Food Court	Indian Restaurant
2	Global Village	Flea Market	Convenience Store	Turkish Restaurant	Coffee Shop	Halal Restaurant	Restaurant	Theme Park	Theater	Fast Food Restaurant	Night Market
3	JBR	Coffee Shop	Hotel	Café	Breakfast Spot	Lounge	Burger Joint	Restaurant	Bar	Fast Food Restaurant	Indian Restaurant

**Step 12 – We use K-means algorithm to cluster the venues using the four places as centroids.**

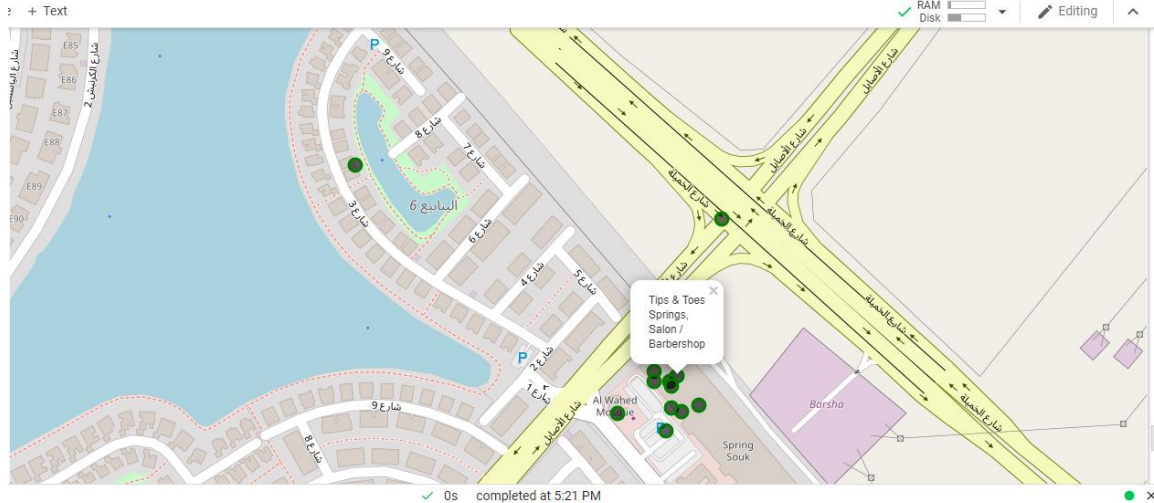
	Place	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0	Burj Khalifa	Café	Movie Theater	Coffee Shop	Arcade	Bakery	Toy / Game Store	Restaurant	Breakfast Spot	Burger Joint	Cosmetics Shop
1	Dubai Airport	Airport Service	Airport Lounge	Coffee Shop	Café	Sandwich Place	Fast Food Restaurant	Middle Eastern Restaurant	Rental Car Location	Food Court	Indian Restaurant
2	Global Village	Flea Market	Convenience Store	Turkish Restaurant	Coffee Shop	Halal Restaurant	Restaurant	Theme Park	Theater	Fast Food Restaurant	Night Market
3	JBR	Coffee Shop	Hotel	Café	Breakfast Spot	Lounge	Burger Joint	Restaurant	Bar	Fast Food Restaurant	Indian Restaurant



13- after observing the most popular venues around each place of the four places, the tourist can decide where he will focus in his/her trip, also for each place the tourist can see the common category of venues around each place using the word cloud, for example JBR has the following word cloud.







## 4. Results

The results of this study showed that JBR has many venues that may have more attraction than the other place, also it was clear that Dubai airport has less attractive venues than the others and this is normal, because the airport is mainly for serving the travelers who are using this airport.

Burj Khalifa has a great number of venues, but it is still less than the ones which are surrounding the Walk of JBR.

So as a tourist, I will visit the four places in the following order:

- 1- JBR.
- 2- Burj Khalifa.
- 3- 3- Global Village.
- 4- Dubai Airport.

## 5. Discussion

Dubai has many places to visit, I believe that using this notebook will help a lot if the user keeps changing the four places to study, we can in a later stage include more than 4 four places, we can study 20 places, or 30, the goal of this notebook is to give a sample about what we can do to get to know any city in the world using some well-known places that resides in it.

## 6- Conclusion

This report discusses a methodology that uses foursquare.com API to study any city in the world in terms of tourism and leisure.

The results of this experience show that using K-means algorithm can help to cluster the places that have common aspects and categories, which can be useful to plan a tourism trip to Dubai ,as see in our experience.