Introduction:

Background/problem:
Finding places for attraction and chilling can be a bit not easy in Dar es Salaam, Tanzania. The city, however, has so much to offer and one may need some guidance in order to make sure that. In Dar es Salaam, one has to know where exactly they intend to go then search for that place. I believe, this should not be the case and one has be able to easily see all the available locations for refreshing before they can commute to such places

In order to solve that challenge, especially for visitors, I intended to create a simple solution in which a person can be able to view all the list of available locations (grouped by category) and if need be can also be able to view all the places within each district and the category it falls on in order to assist them with planning the entertainment and refreshments

Data used:
The data used mostly originated from Foursquare API, where the names and categories of places were extracted. Such data was then combined/distributed into the five districts of Dar es Salaam in order to further narrow down and filter the search for various places. The list of districts of Dar es Salaam can be accessed from http://www.dsm.go.tz/ (under 'Wilaya' dropdown menu) which is the website of the Regional Commissioner of Dar es Salaam

Methodology:
The first step was creating and loading a csv that contains all the district names to my Notebook. I did that by using the pandas library from Python. Later on I used the Nominatim library (imported from geopy.encoders) in order to get the geographical position of each of the districts. This was one of the important steps, since when I started to work on the data at first I realised there was another place in Nigeria that had a similar name as one of the districts of Dar es Salaam (Ilala). I then scrapped some of the information that was not important from the dataframe in order to have a clean dataframe

```
from geopy.geocoders import Nominatim
geolocator = Nominatim(user_agent="attractions")

df['gcode'] = df['District'].apply(geolocator.geocode) #just to be sure it is Dar es Salaam
df['Latitude'] = [g.latitude for g in df.gcode]
df['Longitude'] = [g.longitude for g in df.gcode]

df
```

	District	Population	Area	gcode	Latitude	Longitude
0	Ilala, Dar es Salaam	1,220,611	210.0	(Ilala, Dar es Salaam, Coastal Zone, Tanzania,...	-6.827253	39.261120
1	Kinondoni	1,775,049	527.0	(Kinondoni, Dar es Salaam, Coastal Zone, Tanza...	-6.784067	39.270073
2	Temeke	1,368,881	656.0	(Temeke, Dar es Salaam, Coastal Zone, Tanzania...	-6.851162	39.257311
3	Kigamboni	162,932	NaN	(Kigamboni, Dar es Salaam, Coastal Zone, 3918,...	-6.825456	39.309409
4	Ubungo	845,368	260.0	(Ubungo, Kisiwani, Ubungo, Dar es Salaam, Coas...	-6.793623	39.209661

```
df.drop("Population", axis=1, inplace=True)
df.drop("Area", axis=1, inplace=True)
df.drop("gcode", axis=1, inplace=True)
```

Just to be sure of the location picked by the geopy package, I then plotted a map showing the centre points of each of the districts. This gave me confidence on the specific location that I am dealing with
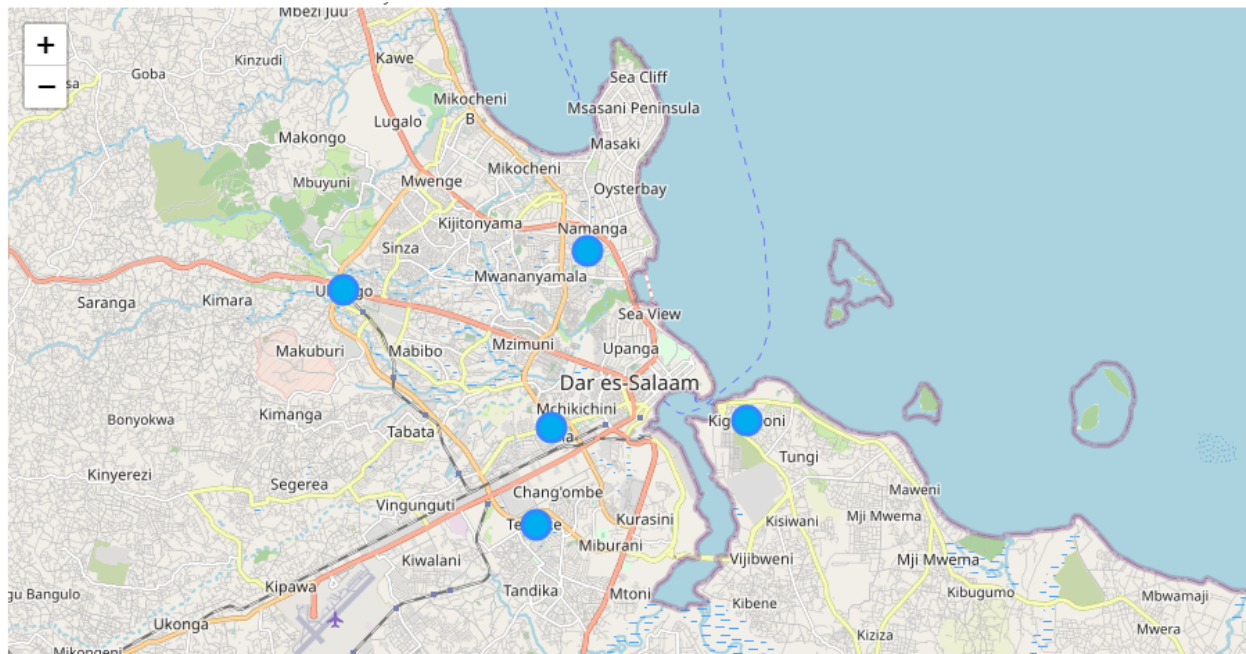
From there I used the Foursquare API data to get location within 10km radius for Ilala district as a base reference to test whether the data are pulling. I then ran head() on the dataframe in order to get at least the 5 first elements of the data as follows

```
venues = places['response']['groups'][0]['items']

nearby_venues = json_normalize(venues)

filtered_columns = ['venue.name', 'venue.categories']
nearby_venues =nearby_venues.loc[:, filtered_columns]

nearby_venues['venue.categories'] = nearby_venues.apply(get_category_type, axis=1)

nearby_venues.columns = [col.split(".")[-1] for col in nearby_venues.columns]

nearby_venues.head()
```

```
<ipython-input-70-1c3ace3321dc>:3: FutureWarning: pandas.io.json.json_normalize is deprecated,
d
  nearby_venues = json_normalize(venues)
```

	name	categories
0	Snocream	Ice Cream Shop
1	Le Grande Restaurant	American Restaurant
2	Hyatt Regency Dar Es Salaam, The Kilimanjaro	Hotel
3	Samaki Samaki	Seafood Restaurant
4	Princess casino	Casino

Next, I created a grouping for these places based on their category for each district within Dar es Salaam. First, summarised my search of categories to Museums and Restaurants in order to have at least a picture of the categories that are available for each location

```
Ilala, Dar es Salaam
Kinondoni
Temeke
Kigamboni
Ubungo
```

```
dsm_restaurants = dsm_places[dsm_places['Venue Category'].str.contains('Restaurant')].reset_index(drop=True)
dsm_restaurants.index = np.arange(1, len(dsm_restaurants)+1)
```

```
print (dsm_restaurants['Venue Category'].value_counts())
```

```
Restaurant              23
Seafood Restaurant      10
Fast Food Restaurant    10
African Restaurant       9
American Restaurant      8
Indian Restaurant        7
Italian Restaurant       6
Thai Restaurant          6
Ethiopian Restaurant     5
Chinese Restaurant       5
Japanese Restaurant      5
Caribbean Restaurant     3
Lebanese Restaurant      2
Mexican Restaurant       2
Name: Venue Category, dtype: int64
```

Later on I did the grouping for that specific category (Restaurants) in order to have an overview of how many restaurants each district has

```
districts_restaurant
```

```
Neighborhood
Ilala, Dar es Salaam    17
Kigamboni               27
Kinondoni               17
Temeke                  24
Ubungo                  16
Name: Venue Category, dtype: int64
```

This helped me to be sure of the categories pulled from each district at a radius of 10km from the focal point

Results:

Results were as follows, where depending on the category that a person chooses, the list of all places in Dar es Salaam, and the district in which they belong to is populated and a specific category related to it is appended on the given list

11	Ilala, Dar es Salaam	Epi d'or	Restaurant
12	Ilala, Dar es Salaam	Delhi Darbar	Indian Restaurant
13	Ilala, Dar es Salaam	Thai Kani	Thai Restaurant
14	Ilala, Dar es Salaam	KFC	Fast Food Restaurant
15	Ilala, Dar es Salaam	Africa sana	African Restaurant
16	Ilala, Dar es Salaam	Kijiji beach resort	African Restaurant
17	Ilala, Dar es Salaam	Velisas	Caribbean Restaurant
18	Kinondoni	Zuane	Italian Restaurant
19	Kinondoni	Addis In Dar	Ethiopian Restaurant
20	Kinondoni	Slipway Waterfront Restaurant	Restaurant
21	Kinondoni	Cape Town Fish Market	Seafood Restaurant
22	Kinondoni	Salt	Restaurant
23	Kinondoni	Samaki Samaki	Seafood Restaurant
24	Kinondoni	Great Wall Restaurant	Chinese Restaurant
25	Kinondoni	Osaka Japanese Food	Japanese Restaurant
26	Kinondoni	Epi d'or	Restaurant
27	Kinondoni	Le Grande Restaurant	American Restaurant
28	Kinondoni	Thai Kani	Thai Restaurant
29	Kinondoni	Blue Rock Spur - Dar es Salaam	Restaurant

The same can be applied to various other categories such as Museum and Beach as follows:

[83]:		Neighborhood	Venue	Venue Category
	1	Temeke	National Museum of Tanzania	Museum
	2	Temeke	Makumbusho Village	History Museum
	3	Kigamboni	National Museum of Tanzania	Museum

For beach category:

	Neighborhood	Venue	Venue Category
1	Ilala, Dar es Salaam	Yacht Club	Beach
2	Ilala, Dar es Salaam	Mikadi Beach Camp	Beach
3	Kinondoni	Yacht Club	Beach
4	Kinondoni	Mikadi Beach Camp	Beach
5	Temeke	Mikadi Beach Camp	Beach
6	Temeke	Oysterbay By The Beach	Beach
7	Temeke	Coco Beach	Beach
8	Kigamboni	Yacht Club	Beach
9	Kigamboni	Mikadi Beach Camp	Beach
10	Ubungo	Yacht Club	Beach

Discussion:

One of the main challenges that I have observed is on the quality of data and information pulled from the Foursquare API. Most of it does not seem very clean as compared to the real locations of some of the places. It can be debated whether the radius used may be too broad but that may need further analysis to prove it. On the quality of tools, I used Anaconda Navigator to launch Jupyterlab on a Lenovo X270 and the execution was very smooth

Conclusion:

A comprehensive list of places, based on their categories and location in which they are found in Dar es Salaam, was extracted and present the user a great dynamic and options when thinking of planning their stays in Dar es Salaam