



Hummus In London

“Wiping” the competition

Hummus

chickpeas'; full Arabic '، حُمُصْ Hummus ([/ˈhuməs/](#), [/hʌməs/](#);^{[1][2]} Arabic: •
chickpeas in tahini') is '، حُمُصْ بالطحينة name: *hummus bi-tahini* Arabic:
a Levantine dip or spread made from cooked, mashed chickpeas or other
beans, blended with tahini, olive oil, lemon juice, salt, and garlic. It is popular
in the Middle East and Mediterranean, as well as in Middle Eastern
cuisine around the globe.

* From Wikipedia.



Introduction

- The purpose of this work is to simulate a business situation of choosing a location for a restaurant. In this case, the potential developer wants to find a place for a **Hummus restaurant** (Chickpeas).
- We will assume for the sake of simplicity that a good location for a restaurant will be around main tourist attractions because of the big tourist traffic.
- I will extract a list of the most popular sites in LONDON and use the Foursquare site location data to find the ideal location for the restaurant according to the competitors locations.
- Competitors in this case will be a list of specific category of restaurants who usually compete with Hummus places like: middle-eastern, Lebanese, Israeli and such.

Data

London main tourist attractions were extracted from this [website](#):

```
import requests
import lxml
from bs4 import BeautifulSoup

# Obtaining data London Tourist website:
source = requests.get('https://www.londoncitybreak.com/areas').text
soup = BeautifulSoup(source, 'lxml')
soup.prettify()

# Listener:1,removeEventListener:m,emit:t,get:g,listeners:v,context:n,buffer:w,abort:a,aborted:[1];return b]function i(){return
new r}function a(){((s.api||s.feature)&&(d.aborted!=0,s.d.backlog={})var u="nr@context",c=e(3),s=(),p={},d=n.expor
ts=o();d.backlog={}),[],gos:[function r(e,n,t){if(o.call(e,n)retur
e[n].var r=t());if(Objec
t.defineProperty&
&Object.keys)try{return Object.defineProperty(e,n,{value:r,writable:!0,enumerable:!1}),r}catch(i){return e[n]=r}var o=Obje
ct.prototype.hasOwnProperty;n.exports=m,[]],handle:[function(e,n,t){function r(e,n,t,r)o.buffer([e],r),o.emit(e,n,t)var o=
e("ee").get("handle");n.exports=r,ee=o,[]],id:[function(e,n,t){function r(e){var n=typeof e;retur
n[e]?"object":n&&"funct
ion"!==n?1:==iwindow?0:a(e,i,function(){return o++})var o=1,i="nr@id",a=e("gos"),n.exports=r,[]],loader:[function(e,n,t)
{function r(){if(!t++)var e=x.info=NREUM.info,n=1.getElementsByTagName("script")[]}0;if(setTimeout(s.abort,3e4),!e&&e.licens
eKey&&e.applicationID&&n)retur
s.abort();c(y,function(n,t){e[n]||(e[n]=t)},f("mark","onload",a)+x.offset],null,"api");va
r t=l.createElement("script");t.src="https://"+e.agent.n.parentNode.insertBefore(t,n)}function o(){("complete"==i.readyState
&&i)function i(){f("mark","domContent",a)+x.offset],null,"api");function a(){return O.exists&&performance.now?Math.round
(performance.now()):u=Math.max((new Date).getTime(),u))-x.offset}var u=(new Date).getTime(),f=e("handle"),c=e(3),s=e("ee"),p
=e(2),d=window,l=d.document,m="addEventListene
r",v="attachEvent",g=d.XMLHttpRequest,w=g&&g.prototype;NREUM.o=(S:	setTimeout,S
I:d.setImmediate,CT:clearTimeout,XHR:g,REQ:d.Request,EV:d.Event,PR:d.Promise,MOD:MutationObserver);var h=""+location,y={beac
on:"bam.nr-data.net",errorBeacon:"bam.nr-data.net",agent:"js-agent.newrelic.com/nr-1130.min.js"},b=g&&w&&w[n]&&l/CriOS/.test
(navigator.userAgent),xn,n.exports={offset:u,now:a,origin:h,features:{},xhrWrappable:b,userAgent:p};e(1),l[m]?l[m]("DOMContent
loaded",i,l),d[m]("load",r,l1):l[v]("onreadystatechange",o),d[v]("onload",r)),f("mark","firstbyte",u),null,"api");var E=
<0,0=e(5),{}],[],["loader"];</script
</meta content="#f70759" name="theme-color>
link as="font" crossorigin="" href="https://cdn.civitatis.com/fonts/civitatis-new-icons.woff2" rel="preload" type="font/woff>
```

The screenshot shows the Civitatis London website. At the top, there's a navigation bar with links for Travel Guide, Day trips and guided tours, Airport transfers, Hotel deals, Car rentals, and Flights. The date is Wednesday, 18/09/2019, at 7:35 PM. On the left, there's a sidebar with sections for General Information (Plan your trip, History, Areas and neighbourhoods, Photos), Top Attractions, Getting to London, Transportation, and Money-saving tips. The main content area features a large image of the London skyline with the title "Areas of London". Below the image, it says "London has 33 districts. Find out about the city's most popular areas and neighbourhoods". To the right, there are two travel offers: "River Thames Lunch Cruise" for \$39.9 and "Night Bus Sightseeing Tour" for \$26.2. Both offers have a 4-star rating and one review.

* See Full code in the notebook attached in the GitHub account.

Retrieving Location Data

Longitude	Latitude	Place	Place
0.135522-	51.497258	Westminster Palace	0
0.128330-	51.499980	Westminster Abbey	1
0.134780-	51.509890	Piccadilly Circus	2
0.075230-	51.509740	Tower of London	3
0.075380-	51.505480	Tower Bridge	4
0.099740-	51.513440	St Paul's Cathedral	5
0.119250-	51.503660	London Eye	6
0.125220-	51.518630	British Museum	7
0.161390-	51.508280	Hyde Park	8
0.145090-	51.537620	Camden Town	9
0.135522-	51.497258	Westminster Palace	12
0.128330-	51.499980	Westminster Abbey	13
0.134780-	51.509890	Piccadilly Circus	14
0.075230-	51.509740	Tower of London	15
0.075380-	51.505480	Tower Bridge	16

'Westminster Palace', 'Westminster Abbey', 'Piccadilly Circus', 'Tower of London', 'Tower Bridge', "St Paul's Cathedral", 'London Eye', 'British Museum', 'Hyde Park', 'Camden Town', 'Ver todo', 'Monuments and Tourist attractions', 'Westminster Palace', 'Westminster Abbey', 'Piccadilly Circus', 'Tower of London', 'Tower Bridge', "St Paul's Cathedral", 'London Eye', 'Buckingham Palace', 'Big Ben', 'Kensington Palace', 'Trafalgar Square', 'Covent Garden', 'The Shard', 'Chinatown', 'The Old Operating Theatre', 'The Monument', 'Shakespeare's Globe Theatre', 'Changing of the Guard', 'Apsley House', 'City Hall', 'HMS Belfast', 'Ver todos', 'Museums and Galleries', 'British Museum', 'National Gallery', 'Imperial War Museum', 'The Wallace Collection', 'Madame Tussauds London', 'The Natural History Museum', 'Science Museum', 'Victoria and Albert Museum', 'Tate Modern', 'Tate Britain', 'Museum of London', 'National Portrait Gallery', 'London Transport Museum', 'Sherlock Holmes Museum', 'Sir John Soane's Museum', 'Ripley's Believe it or not!', 'Ver todos', 'Parks and Gardens', 'Hyde Park', 'St James's Park', 'Kensington Gardens', "Regent's Park", 'Green Park'

```
# Form a dataframe:  
dict = {'Place' : PlaceName}  
  
info = pd.DataFrame.from_dict(dict)  
info.head()
```

Place
Westminster Palace 0
Westminster Abbey 1
Piccadilly Circus 2
Tower of London 3
Tower Bridge 4

Visualizing Potential areas by locations



Extracting Surrounding businesses

- Using Foursquare API to extract top 100 businesses at the vicinity of each tourist attraction:

```
print(London_venues.shape)
London_venues
```

```
(7 ,4109)
```

Venue Category	Venue Longitude	Venue Latitude	Venue	Place Longitude	Place Latitude	Place	
Hotel	0.137404-	51.498598	Taj 51 Buckingham Gate Suites & Residences	0.135522-	51.497258	Westminster Palace	0
Indie Movie Theater	0.136744-	51.497473	Curzon Victoria	0.135522-	51.497258	Westminster Palace	1
Coffee Shop	0.136011-	51.496791	Iris & June	0.135522-	51.497258	Westminster Palace	2
Sporting Goods Shop	0.135426-	51.498128	Run & Become	0.135522-	51.497258	Westminster Palace	3
Hotel	0.134417-	51.499137	St Ermin's Hotel	0.135522-	51.497258	Westminster Palace	4
French Restaurant	0.135455-	51.497964	Chez Antoinette	0.135522-	51.497258	Westminster Palace	5
Coffee Shop	0.133858-	51.497496	Flat Cap Coffee Co	0.135522-	51.497258	Westminster Palace	6
Indian Restaurant	0.137522-	51.498772	Quilon	0.135522-	51.497258	Westminster Palace	7
Gym	0.137257-	51.496934	Gymbox	0.135522-	51.497258	Westminster Palace	8

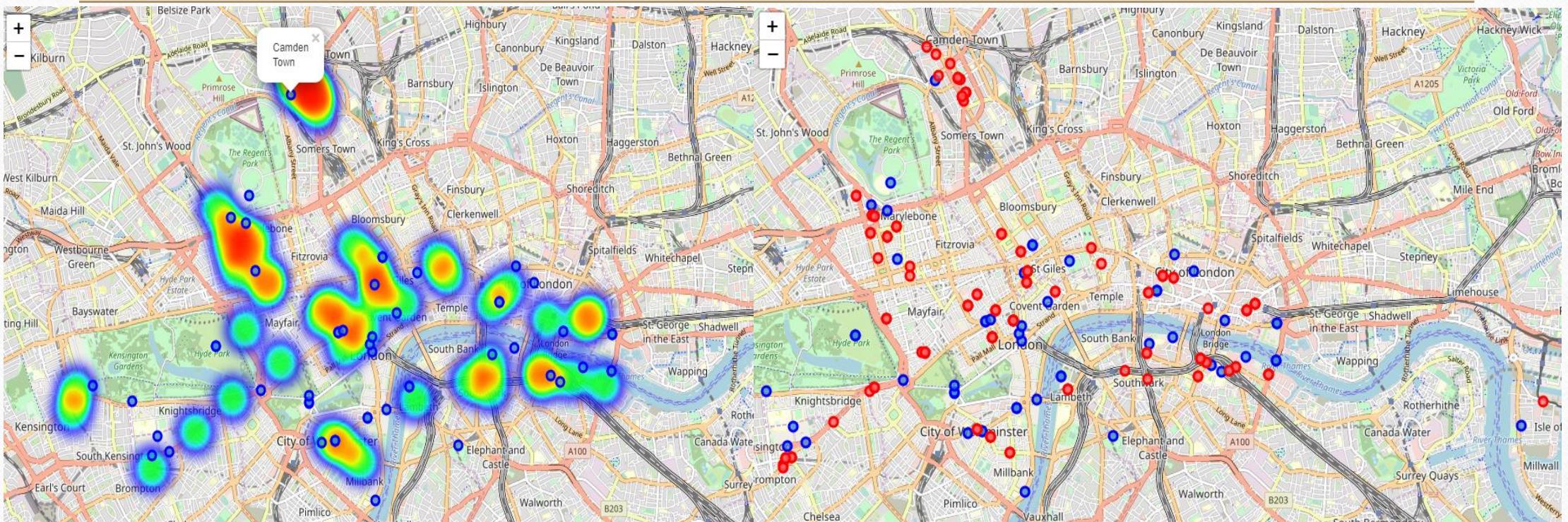
Searching for potential competition

- Using Foursquare database I mapped the surrounding businesses of each tourist location. The goal is to check similar restaurants in a radius of 750M of the potential spot.
- Competing restaurants for Hummus are:

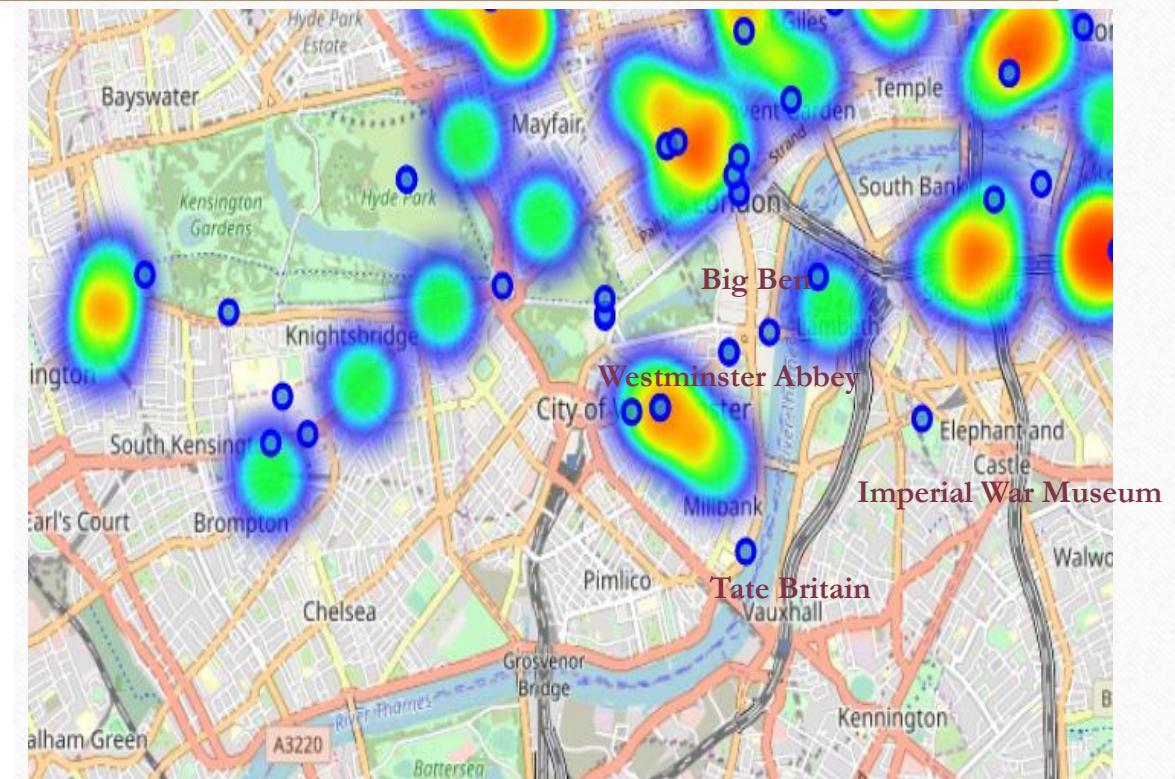
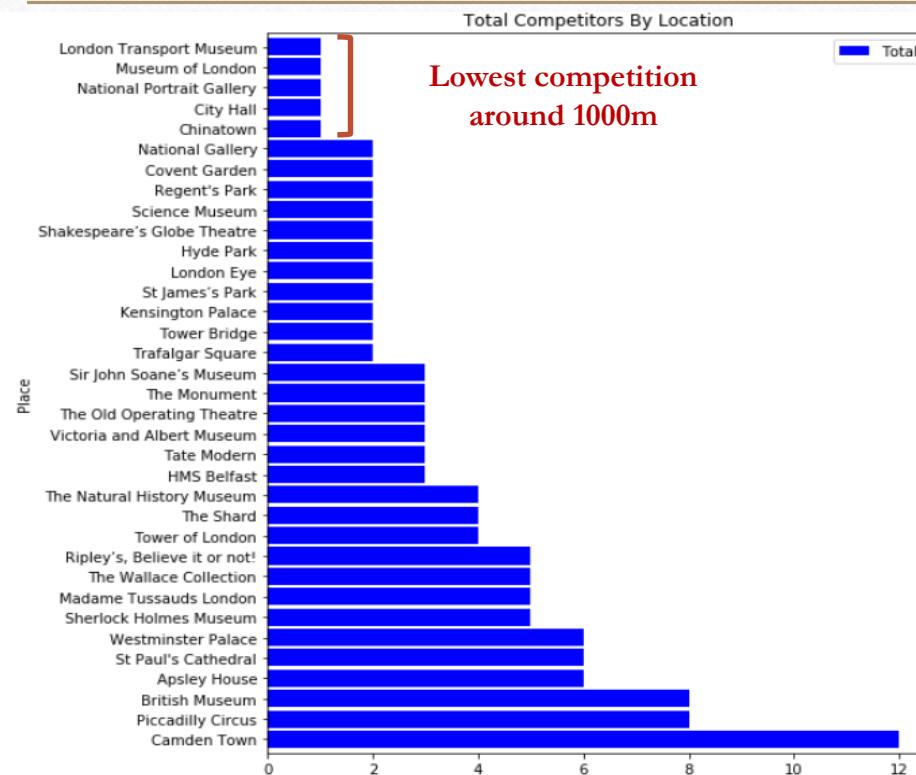
"Turkish Restaurant", "Mediterranean Restaurant", "Israeli Restaurant", "Middle Eastern Restaurant", "Kebab Restaurant", "Falafel Restaurant", "Halal Restaurant", "Iraqi Restaurant", "Lebanese Restaurant", "Persian Restaurant", "Greek Restaurant", "Moroccan Restaurant", "Fast Food Restaurant", "Vegetarian / Vegan Restaurant", "Sandwich Place", "Fast Food Restaurant".

- These are regarded as competition since they usually offer Hummus in their menu and offer similar sitting atmosphere.
- Fast food and veg/vegan categories were chosen since Hummus is also a vegan/veg choice and it's fast serving can be considered as "Fast Food".

Visualizing Competition



Visualizing Competition



Clustering neighborhoods

- Performing analysis with K-means algorithm will help us to further understand the characteristics of potential spots.

7th Most Common Venue	6th Most Common Venue	5th Most Common Venue	4th Most Common Venue	3rd Most Common Venue	2nd Most Common Venue	1st Most Common Venue	Place	
Moroccan Restaurant	Vegetarian / Vegan Restaurant	Iraqi Restaurant	Lebanese Restaurant	Persian Restaurant	Turkish Restaurant	Middle Eastern Restaurant	Apsley House	0
Middle Eastern Restaurant	Moroccan Restaurant	Persian Restaurant	Vegetarian / Vegan Restaurant	Greek Restaurant	Turkish Restaurant	Mediterranean Restaurant	British Museum	1
Turkish Restaurant	Fast Food Restaurant	Halal Restaurant	Kebab Restaurant	Middle Eastern Restaurant	Vegetarian / Vegan Restaurant	Greek Restaurant	Camden Town	2
Lebanese Restaurant	Mediterranean Restaurant	Middle Eastern Restaurant	Moroccan Restaurant	Persian Restaurant	Vegetarian / Vegan Restaurant	Turkish Restaurant	Chinatown	3
Mediterranean Restaurant	Middle Eastern Restaurant	Moroccan Restaurant	Persian Restaurant	Turkish Restaurant	Vegetarian / Vegan Restaurant	Falafel Restaurant	City Hall	4

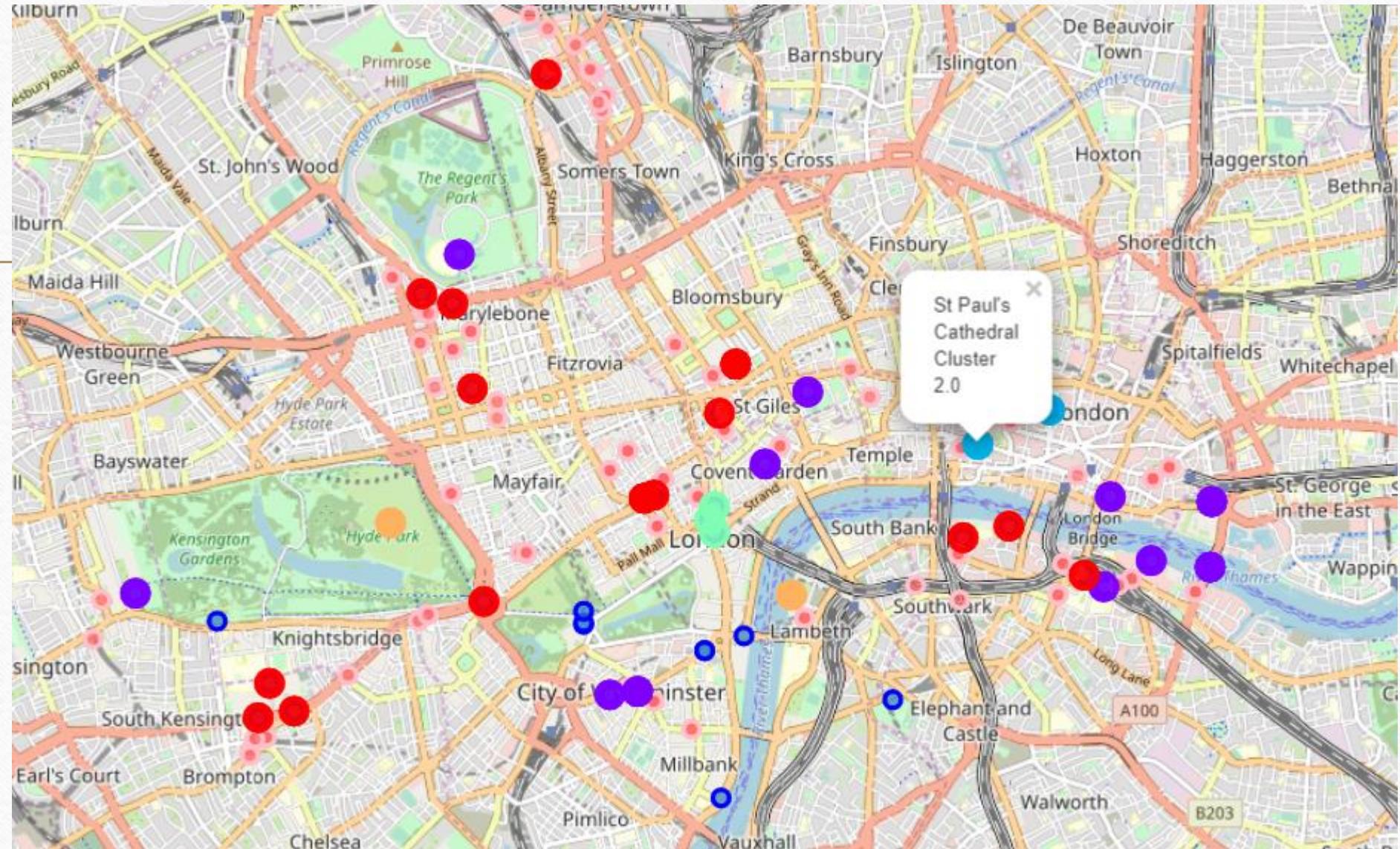
Analysis of frequency of occurrence of places

* See Full code in the notebook attached in the GitHub account.

After Clustering

5th Most Common Venue	4th Most Common Venue	3rd Most Common Venue	2nd Most Common Venue	1st Most Common Venue	Cluster Labels	Longitude	Latitude	Place
Persian Restaurant	Turkish Restaurant	Vegetarian / Vegan Restaurant	Falafel Restaurant	Fast Food Restaurant	1.0	0.135522-	51.497258	Westminster Palace 0
Turkish Restaurant	Greek Restaurant	Israeli Restaurant	Mediterranean Restaurant	Vegetarian / Vegan Restaurant	0.0	0.134780-	51.509890	Piccadilly Circus 2
Moroccan Restaurant	Persian Restaurant	Vegetarian / Vegan Restaurant	Fast Food Restaurant	Turkish Restaurant	1.0	0.075230-	51.509740	Tower of London 3
Middle Eastern Restaurant	Moroccan Restaurant	Persian Restaurant	Turkish Restaurant	Vegetarian / Vegan Restaurant	1.0	0.075380-	51.505480	Tower Bridge 4
Moroccan Restaurant	Persian Restaurant	Vegetarian / Vegan Restaurant	Turkish Restaurant	Falafel Restaurant	2.0	0.099740-	51.513440	St Paul's Cathedral 5
Middle Eastern Restaurant	Moroccan Restaurant	Persian Restaurant	Vegetarian / Vegan Restaurant	Turkish Restaurant	4.0	0.119250-	51.503660	London Eye 6
Persian Restaurant	Vegetarian / Vegan Restaurant	Greek Restaurant	Turkish Restaurant	Mediterranean Restaurant	0.0	0.125220-	51.518630	British Museum 7
Middle Eastern Restaurant	Moroccan Restaurant	Persian Restaurant	Vegetarian / Vegan Restaurant	Turkish Restaurant	4.0	0.161390-	51.508280	Hyde Park 8
Halal Restaurant	Kebab Restaurant	Middle Eastern Restaurant	Vegetarian / Vegan Restaurant	Greek Restaurant	0.0	0.145090-	51.537620	Camden Town 9
Persian Restaurant	Turkish Restaurant	Vegetarian / Vegan Restaurant	Falafel Restaurant	Fast Food Restaurant	1.0	0.135522-	51.497258	Westminster Palace 12

* See Full code in the notebook attached in the GitHub account.



Summery

- After analyzing the clustering process combining we can come to few conclusions:
 1. Places labeled “2” (**blue**) are in vicinity to Falafel restaurants. These are considered very competitive to Hummus restaurants due to their fast food nature and the fact the falafel is also made of Hummus.
 2. Places labeled “3” (**green**) are in vicinity to Kebab restaurants. These are probably less competitive because they serve meat in their menu.
 3. Places labeled “4” are in vicinity to Turkish restaurants. These are probably also less competitive because Turkish restaurants offer their guests a more stylistic atmosphere.
 4. Places labeled “1” and “0” (**red, purple**) do not lead to any particular conclusion. They are just a mixed group of restaurants.

Conclusion

After analyzing the most popular sites in London. It can be concluded that it is best to open a hummus restaurant in areas that do not contain any competitors or near sites that are labeled "2".

