

Market analysis for a Japanese sushi restaurant company

Capstone project, Week 5

Introduction

- ▶ **General description:** exploring the boroughs in London and in Madrid to suggest the best city to open a sushi restaurant
- ▶ **Vision:** the owner of the company wants this activity to become a landmark in the city in order to expand this business also in the other European nations
- ▶ **Requirements:** Focus the analysis on the top 5 richest areas of the cities

Top 5 richest boroughs to analyse

London

- ▶ Camden
- ▶ Hackney
- ▶ Hammersmith and Fulham
- ▶ Kensington and Chelsea
- ▶ Westminster

Madrid

- ▶ Centro
- ▶ Chamrtin
- ▶ Chamberi
- ▶ Retiro
- ▶ Salamanca

Methodology: Python to analyse

The entire model was developed in Python by using this libraries:

- ▶ **bs4**: for web scraping
- ▶ **folium**: to generate maps
- ▶ **geopy**: to convert an address into latitude and longitude values
- ▶ **matplotlib**: to detail maps and eventually plot graphs
- ▶ **numpy**: to exploit some of its mathematical methods
- ▶ **pandas**: to create and manipulate databases
- ▶ **sklearn**: to create the clusters
- ▶ **requests**: to manage http requests

Data Collection

Information retrieved from these sources:

- ▶ **London:** https://en.wikipedia.org/wiki/List_of_London_boroughs
- ▶ **Madrid:** https://en.wikipedia.org/wiki/Districts_of_Madrid

Data Cleaning

GIGO (Garbage In, Garbage Out) to clean and organize Dataframes and so eliminating useless columns, NaNs and poorly formatted data.

A clear example of the reason of this stage is given if considering the initial appearance of the London DataFrame

	Borough	Inner	Status	Local authority	Political control	Headquarters	Area (sq mi)	Population (2019 est)[1]	Co-ordinates	Nr. in map
0	Barking and Dagenham [note 1]	NaN	NaN	Barking and Dagenham London Borough Council	Labour	Town Hall, 1 Town Square	13.93	212806	.mw-parser-output .geo-default,.mw-parser-outp...	25
1	Barnet	NaN	NaN	Barnet London Borough Council	Conservative	Barnet House, 2 Bristol Avenue, Colindale	33.49	395896	51°37'31"N 0°09'06"W / 51.6252°N 0.1517°W	31
2	Bexley	NaN	NaN	Bexley London Borough Council	Conservative	Civic Offices, 2 Watling Street	23.38	248287	51°27'18"N 0°09'02"E / 51.4549°N 0.1505°E	23
3	Brent	NaN	NaN	Brent London Borough Council	Labour	Brent Civic Centre, Engineers Way	16.70	329771	51°33'32"N 0°16'54"W / 51.5588°N 0.2817°W	12
4	Bromley	NaN	NaN	Bromley London Borough Council	Conservative	Civic Centre, Stockwell Close	57.97	332336	51°24'14"N 0°01'11"E / 51.4039°N 0.0198°E	20

Bad formatting NaNs

Not essential

These will be retrieved from a more accurate source

Using Foursquare and geopy

Foursquare in combination with **geopy** made possible to retrieve information about venues in the cities:

- ▶ **Name** of the Borough
- ▶ **Latitude** of the Borough
- ▶ **Longitude** of the Borough
- ▶ **Venue**: name of the Venue
- ▶ **Venue Latitude**: latitude of Venue
- ▶ **Venue Longitude**: longitude of Venue
- ▶ **Venue Category**: category of Venue

Dataframes after GIG0 and Foursquare

	Borough	Area (sq mi)	Population (2019)	Latitude	Longitude
0	Barking and Dagenham	13.93	212906	51.554117	0.150504
1	Barnet	33.49	395896	51.653090	-0.200226
2	Bexley	23.38	248287	51.441679	0.150488
3	Brent	16.70	329771	51.563826	-0.275760
4	Bromley	57.97	332336	51.402805	0.014814
5	Camden	8.40	270029	51.542305	-0.139560
6	Croydon	33.41	386710	51.371305	-0.101957
7	Ealing	21.44	341806	51.512655	-0.305195
8	Enfield	31.74	333794	51.652085	-0.081018
9	Greenwich	18.28	287942	51.482084	-0.004542
10	Hackney	7.36	281120	51.543240	-0.049362
11	Hammersmith and Fulham	6.33	185143	51.492038	-0.223640
12	Haringey	11.42	268647	51.601474	-0.111782
13	Harrow	19.49	251160	51.596827	-0.337316
14	Havering	43.35	259552	51.544385	-0.144307
15	Hillingdon	44.67	306870	51.542519	-0.448335
16	Hounslow	21.61	271523	51.468613	-0.361347
17	Islington	5.74	242467	51.538429	-0.099905
18	Kensington and Chelsea	4.68	156129	51.498480	-0.199043
19	Kingston upon Thames	14.38	177507	51.409627	-0.306262
20	Lambeth	10.36	326034	51.501301	-0.117287
21	Lewisham	13.57	305842	51.462432	-0.010133
22	Merton	14.52	206548	51.410870	-0.188097
23	Newham	13.98	353134	51.530000	0.029318
24	Redbridge	21.78	305222	51.576320	0.045410
25	Richmond upon Thames	22.17	198019	51.440553	-0.307639
26	Southwark	11.14	318830	51.502922	-0.103458
27	Sutton	16.93	206349	51.357464	-0.173627
28	Tower Hamlets	7.63	324745	51.520300	0.029300
29	Waltham Forest	14.99	276983	51.598169	-0.017837
30	Wandsworth	13.23	329677	51.457027	-0.193261
31	Westminster	8.29	261317	51.500444	-0.126540

	Borough	Population	Latitude	Longitude
0	Centro	131928	40.417653	-3.707914
1	Arganzuela	151965	40.396954	-3.697289
2	Retiro	118516	40.411150	-3.676057
3	Salamanca	143800	40.427045	-3.680602
4	Chamartín	143424	40.458987	-3.676129
5	Tetuán	153789	40.460578	-3.698281
6	Chamberí	137401	40.436247	-3.703830
7	Fuencarral-El Pardo	238756	40.556346	-3.778591
8	Moncloa-Aravaca	116903	40.439495	-3.744204
9	Latina	233808	40.403532	-3.736152
10	Carabanchel	243998	40.374211	-3.744676
11	Usera	134791	40.383894	-3.706446
12	Puente de Vallecas	227595	40.383553	-3.654535
13	Moratalaz	94197	40.405933	-3.644874
14	Ciudad Lineal	212529	40.448431	-3.650495
15	Hortaleza	180462	40.472549	-3.642552
16	Villaverde	142608	40.345610	-3.695956
17	Villa de Vallecas	104421	40.373958	-3.612163
18	Vicálvaro	70051	40.396584	-3.576622
19	San Blas-Canillejas	154357	40.428919	-3.604002
20	Barajas	46876	40.473318	-3.579845

Isolating top 5 borough and their venues

London

	Borough	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
5	Camden	Pub	Coffee Shop	Café	Burger Joint	Italian Restaurant	Ice Cream Shop	Beer Bar	Vegetarian / Vegan Restaurant	Caribbean Restaurant	Vietnamese Restaurant
10	Hackney	Coffee Shop	Pub	Café	Supermarket	Brewery	Flea Market	Beer Store	Sporting Goods Shop	Boutique	Yoga Studio
11	Hammersmith and Fulham	Café	Pub	Coffee Shop	Hotel	Gym / Fitness Center	Grocery Store	Sandwich Place	Thai Restaurant	Breakfast Spot	Portuguese Restaurant
18	Kensington and Chelsea	Café	Pub	Italian Restaurant	Persian Restaurant	Burger Joint	Clothing Store	Supermarket	Breakfast Spot	Mediterranean Restaurant	Filipino Restaurant
31	Westminster	Coffee Shop	Pub	Sandwich Place	Historic Site	Outdoor Sculpture	Plaza	Café	Monument / Landmark	Hotel	Garden

Madrid

	Borough	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
3	Centro	Plaza	Spanish Restaurant	Hotel	Gourmet Shop	Bookstore	Hostel	Tapas Restaurant	Restaurant	Department Store	Mexican Restaurant
4	Chamartin	Restaurant	Spanish Restaurant	Mediterranean Restaurant	Grocery Store	Gym	Tapas Restaurant	Plaza	Supermarket	Cocktail Bar	Bar
6	Chamberi	Spanish Restaurant	Tapas Restaurant	Bar	Café	Restaurant	Theater	Bakery	Plaza	Mediterranean Restaurant	Beer Bar
12	Retiro	Spanish Restaurant	Plaza	Garden	Supermarket	Dog Run	Diner	Jazz Club	Dessert Shop	Board Shop	Pizza Place
13	Salamanca	Restaurant	Spanish Restaurant	Tapas Restaurant	Furniture / Home Store	Italian Restaurant	Burger Joint	Mediterranean Restaurant	Bakery	Ice Cream Shop	Café

Focus on London: looking at the data

	Borough	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
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Pros

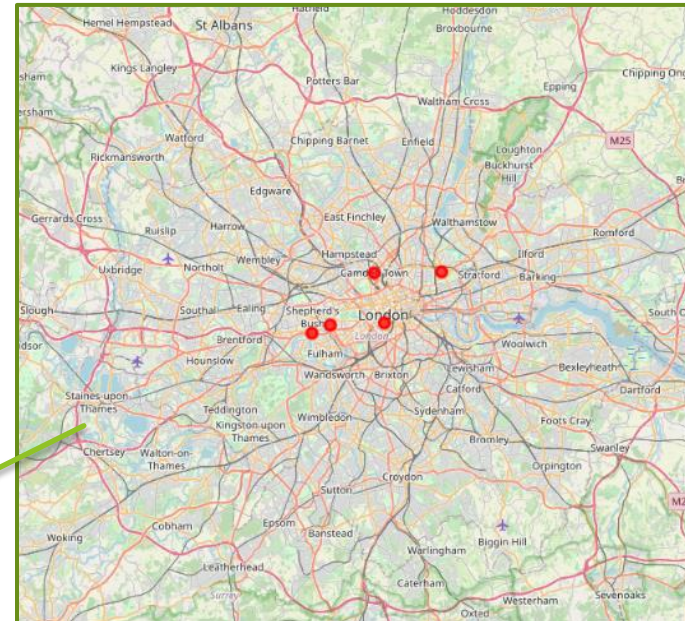
- Citizens from various continents
- Different cuisines appreciated
- Good balance between food services and other ones

Cons

- Not possible to identify a trend in restaurants, the market offers multiple choices
- The most appreciated food-related services are Pubs and Coffee shops

Focus on London: visualizing clusters

Using K-Means to identify clusters. Here's the resulting map



Focus on Madrid: looking at the data

	Borough	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
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Pros

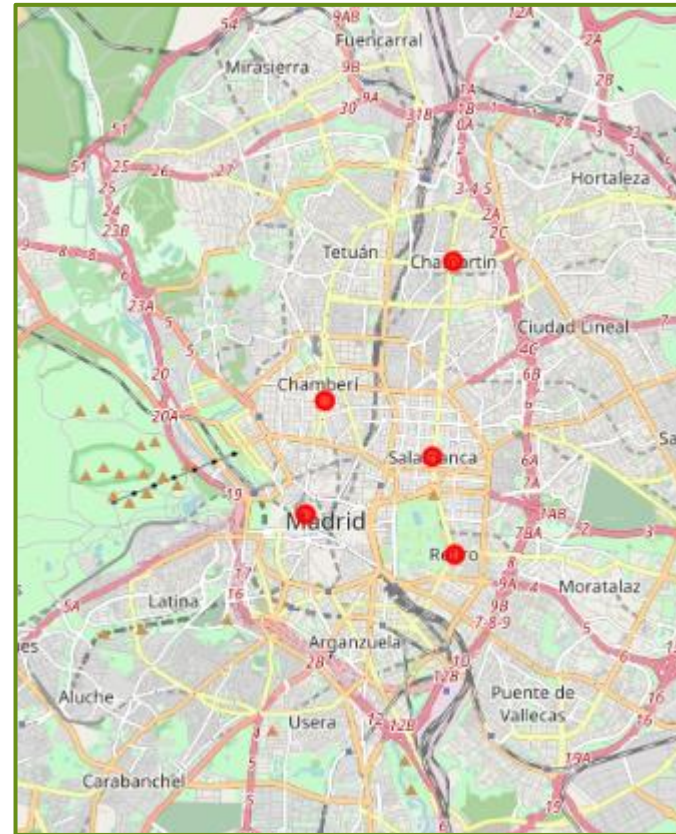
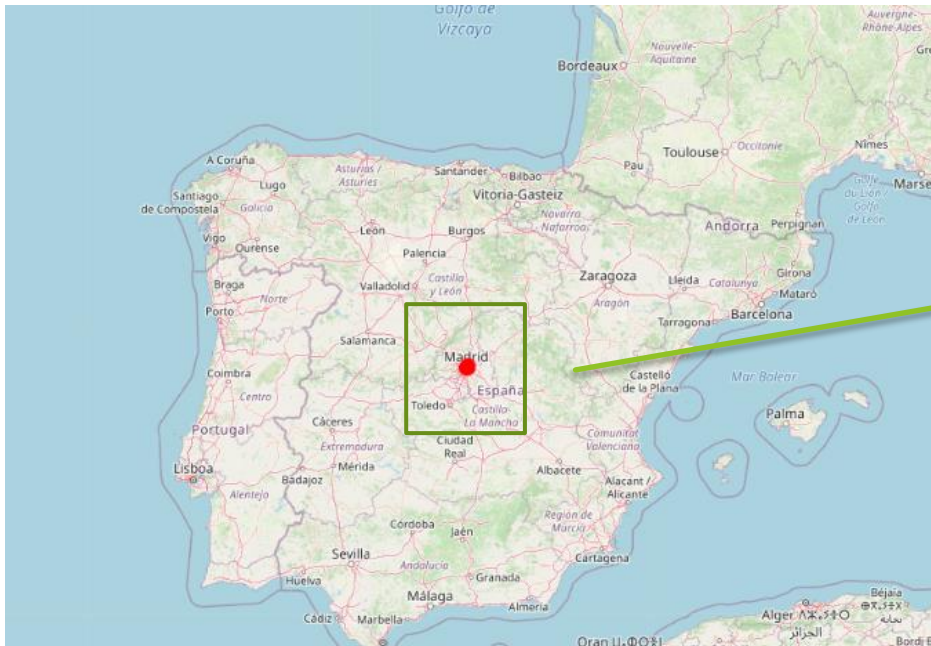
- Absence of any kind Asian restaurant
- More traditional lifestyle associated with dinner: more restaurants than Pub and/or coffee shops

Cons

- Not as multicultural as London
- Spanish is the hottest trend for restaurants

Focus on Madrid: visualizing clusters

Using K-Means to identify clusters. Here's the resulting map



Conclusions

- ▶ Despite the cosmopolite spirit of the initiative seems to be more affine with the multicultural London, **Madrid** should be preferred to open a sushi restaurant.
- ▶ The recurrence of more typical restaurants (e.g. Spanish and/or Mediterranean) leaves room for a new kind of trend such as a world class sushi restaurant experience.
- ▶ **London should not be considered in this first stage** since a sushi restaurants risks to become just one among the others. It is preferable to think to **expand the business to London once consolidated the brand in Spain.**