

**This Capstone project is the final assignment of the IBM data science professional certificate**

**“In 2019, what is the most strategic location to open a fine dining Italian restaurant in Melbourne, Australia?”**

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## **Context**

My friend from Italy, Giuseppe, is coming to visit me at the end of April this year. He wants to visit Melbourne but also has a plan to start a business in Australia. His idea would be to open a fine dining Italian restaurant in the city.

He has heard of the city of Melbourne as being a great place for food and he knows that many restaurants have built a worldwide reputation within its walls.

I am planning to walk him through the city centre of Melbourne and show him various restaurants I know in Southbank and Carlton districts where I have had the chance to taste delicious Italian food.

We will probably also visit some popular markets like South Melbourne market, Prahran market or Victoria market which is the biggest market in Melbourne and ideally located at a close distance from the CBD.

Indeed, the proximity to CBD could be an important factor to consider in opening a restaurant as this area is very dense, organized as a small rectangle in the centre of the city and it attracts an important proportion of the venues and tourists.

With all these elements in mind and my knowledge of the city, I want to find a way to help my friend as best as I can

## Question at stake

The idea came from the will to help my friend in assessing a business opening in Melbourne but the analysis can be extended to anyone seeking to open an Italian restaurant in the city and who is searching for the best location to do so.

In the light of the elements discussed earlier, we can try to think about where would be the best place to start a fine dining restaurant in Melbourne. We will need to consider the repartition of Melbourne venues within each district with a particular focus on existing Italian restaurants. Close distance to city centre and area of dense population would certainly be a plus. It would also be interesting to take a peak at some of the comments made on the existing restaurants in order to get a feel for the expectations of potential customers.

In Melbourne, people know Carlton district as being the “Italian corner”. Many festivals are organized around Lygon street throughout the year and it will be interesting to see if I find a confirmation of this in the data.

More generally, with the help of data analysis and Foursquare in particular, I would like to understand where the potential customers are more likely to go for Italian food, what is their opinion about existing restaurants and finally where could potentially be a good place to start such a business.

## Data and Analytical steps

*NB: The following steps are based on the findings of the research, narrowing down the best locations to open a fine dining restaurant in Melbourne*

1. Part 1 : First, we want to create a database that encapsulates the main districts in the city centre of Melbourne with their latitude and longitude.

We will be using some Python code and rely on the following libraries:

- NumPy
- Panda
- Matplotlib
- Folium

Data will be extracted from a Wikipedia page for the districts names and corresponding postcodes:

[https://en.wikipedia.org/wiki/List\\_of\\_Melbourne\\_suburbs](https://en.wikipedia.org/wiki/List_of_Melbourne_suburbs)

2. Part 2 : Now let's analyse our data using Foursquare API in order to find the best location for our restaurant

2.a : Let's first look at the 10 districts and understand the popular venues within them

2.b : Let's now consider the 3 districts where customers are likely to go for italian food. It would be interesting to get a list of the italian restaurants in these districts

2.c : Now let's have a look at some ratings and comments about the restaurants in Carlton and CBD and see if we can get some insight from it

### **Conclusion:**

We will develop a recommendation, based on the findings of our research

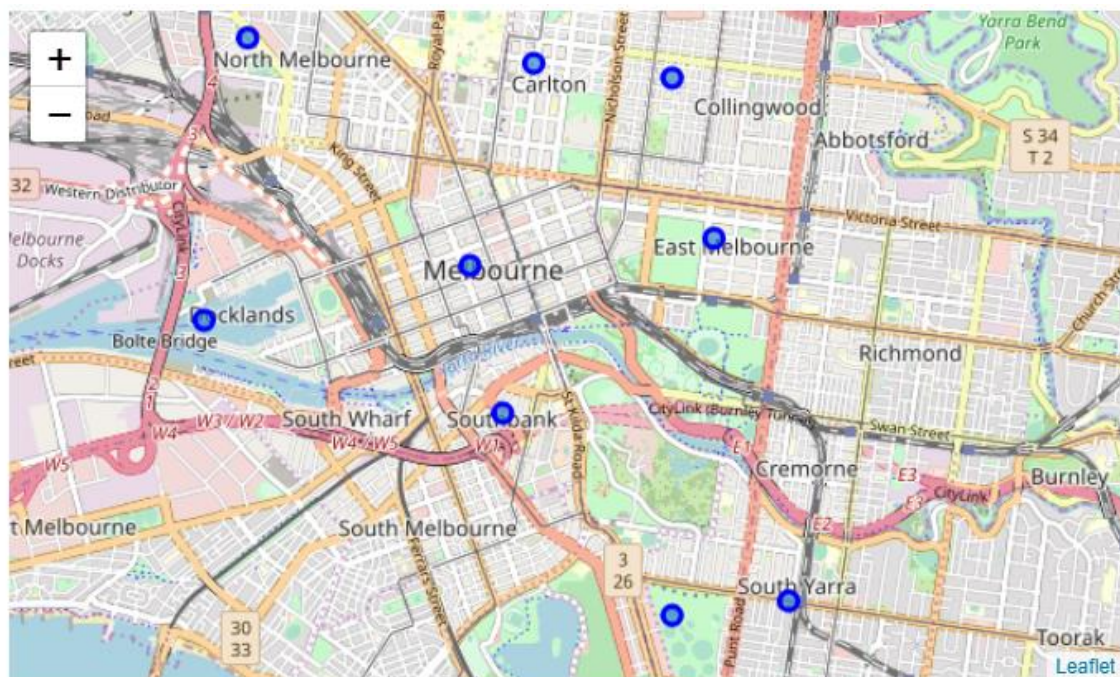
**Part 1 : First, we want to create a database that encapsulates the main districts in the city centre of Melbourne with their latitude and longitude**

We will focus on the central districts of Melbourne that can be visualized at the following Wikipedia page: [https://en.wikipedia.org/wiki/List\\_of\\_Melbourne\\_suburbs](https://en.wikipedia.org/wiki/List_of_Melbourne_suburbs)

See on the page: Inner City municipalities and their suburbs

	District	Latitude	Longitude	PC
0	CBD	-37.814	144.961	3000
1	East Melbourne	-37.812	144.984	3002
2	St Kilda Road	-37.840	144.980	3004
3	Southbank	-37.825	144.964	3006
4	Docklands	-37.818	144.936	3008
5	North Melbourne	-37.797	144.940	3051
6	Parkville	-37.786	144.952	3052
7	Carlton South	-37.799	144.967	3053
8	Fitzroy	-37.800	144.980	3065
9	South Yarra	-37.839	144.991	3141

We then create a map of Melbourne with our districts centred on the latitude and longitude of Southbank to have a first geographical snapshot



As you can see on the map, the blue dots are organized around the cbd which is a small rectangle in the center of the city

## Part 2 : Now let's analyse our data using Foursquare API in order to find the best location for our restaurant

2.a : Let's first look at the 10 districts and understand the popular venues within them

We create a dataframe which layout initially looks like this:

	District	District Latitude	District Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	CBD	-37.814	144.961	Tipo 00	-37.813527	144.961978	Italian Restaurant
1	CBD	-37.814	144.961	Brother Baba Budan	-37.813445	144.962137	Coffee Shop
2	CBD	-37.814	144.961	Kirk's Wine Bar	-37.813661	144.961351	Wine Bar
3	CBD	-37.814	144.961	Manchester Press	-37.813740	144.962132	Café
4	CBD	-37.814	144.961	Red Spice Road	-37.815332	144.961644	Thai Restaurant

There are 133 unique categories.

Now let's print each district along with the 5 most popular venues:

```

----CBD----
              venue  freq
0              Café  0.12
1          Coffee Shop  0.07
2              Bar  0.06
3          Dessert Shop  0.05
4  Italian Restaurant  0.04

```

```

----East Melbourne----
              venue  freq
0              Café  0.10
1              Hotel  0.10
2              Park  0.10
3  Light Rail Station  0.07
4    Sculpture Garden  0.07

```

```

----Carlton South----
              venue  freq
0          Coffee Shop  0.12
1              Café  0.12
2  Italian Restaurant  0.12
3          Deli / Bodega  0.05
4              Wine Bar  0.05

```

```

----Fitzroy----
              venue  freq
0              Café  0.15
1              Bar  0.10
2          Cocktail Bar  0.06
3  Vegetarian / Vegan Restaurant  0.05
4              Pub  0.05

```

```

----Docklands----
              venue  freq
0              Park  0.09
1              Pier  0.09
2          Sushi Restaurant  0.09
3  Performing Arts Venue  0.09
4          Flea Market  0.09

```

----North Melbourne----

	venue	freq
0	Café	0.13
1	Dog Run	0.07
2	Playground	0.07
3	Museum	0.07
4	Grocery Store	0.07

----Parkville----

	venue	freq
0	Zoo Exhibit	0.47
1	Zoo	0.12
2	Bakery	0.06
3	Park	0.06
4	Sports Club	0.06

----South Yarra----

	venue	freq
0	Café	0.17
1	Italian Restaurant	0.11
2	Japanese Restaurant	0.06
3	Hotel	0.06
4	Coffee Shop	0.04

----Southbank----

	venue	freq
0	Bar	0.11
1	Hotel	0.09
2	Café	0.09
3	Grocery Store	0.05
4	Performing Arts Venue	0.04

----St Kilda Road----

	venue	freq
0	Café	0.45
1	Hotel	0.14
2	Gym	0.05
3	Park	0.05
4	French Restaurant	0.05

Taking a look at these data we can see that Italian restaurants are among the most popular venues in Carlton district with a frequency rate of 0.12. They are also the 2nd most popular venue in South Yarra with a rate of 0.11. Last but not least, the CBD has a frequency rate of 0.04 but given the density of venues in that area it should also be considered in our analysis.

Cafe/Coffee shop are the most popular venues by far in almost every district which tends to confirm the reputation of Melbourne for its cafes. Having a good Italian coffee on the menu will probably add to the value of a future Italian restaurant in the city.

**2.b : Let's now consider the 3 districts where customers are likely to go for Italian food. It would be interesting to get a list of the Italian restaurants in these districts**

South Yarra:

	name	categories	address	cc	city	country	distance	formattedAddress	labeledLatLngs	lat	lng
0	Cucinetta	Italian Restaurant	4/3 Murphy St	AU	South Yarra	Australia	103	[4/3 Murphy St, South Yarra VIC 3141, Australia]	[{"lng": 144.990213, "lat": -37.838314, "label...}	-37.838314	144.990213

Carlton:

	name	categories	address	cc	city	country	crossStreet	distance	formattedAddress	labeledLatLngs	lat	lng
0	Universal Italian Restaurant	Italian Restaurant	139-141 Lygon St	AU	Carlton	Australia	NaN	542	[139-141 Lygon St, Carlton VIC 3053, Australia]	[{"lng": 144.9663526478978, "lat": -37.8038504...}	-37.803850	144.966353
1	Italian Chamber Of Commerce and Industry in Au...	Office	Level 1, 185 Faraday Street	AU	Carlton	Australia	NaN	122	[Level 1, 185 Faraday Street, Carlton VIC 3054...]	[{"lng": 144.968387, "lat": -37.798917, "label...}	-37.798917	144.968387
2	Gemma Simply Italian	Italian Restaurant	183 Elgin St	AU	Carlton	Australia	NaN	222	[183 Elgin St, Carlton VIC 3053, Australia]	[{"lng": 144.96835382776104, "lat": -37.797308...}	-37.797309	144.968354
3	Dolomiti Italian Style	Bike Shop	Elgin Street	AU	Carlton	Australia	Lygon St	184	[Elgin Street (Lygon St), Carlton VIC 3053, Au...]	[{"lng": 144.9678010646946, "lat": -37.7974721...}	-37.797472	144.967801
4	Centre of Italian studies	Community College	247 Cardigan st	AU	Carlton	Australia	NaN	278	[247 Cardigan st, Carlton VIC, Australia]	[{"lng": 144.96520161165256, "lat": -37.801064...}	-37.801064	144.965202
5	Museo Italiano	History Museum	199 Faraday St	AU	Carlton	Australia	lygon st	85	[199 Faraday St (lygon st), Carlton VIC 3053, ...]	[{"lng": 144.96794954217452, "lat": -37.798819...}	-37.798819	144.967950
6	Bentornato Al Bar Italiano	Italian Restaurant	326 Lygon Street	AU	NaN	Australia	NaN	397	[326 Lygon Street, Australia]	[{"lng": 144.964167, "lat": -37.801778, "label...}	-37.801778	144.964167

CBD:

	name	categories	address	cc	city	country	crossStreet	distance	formattedAddress	labeledLatLngs	lat	
0	Lil Solito Posto Italian	Italian Restaurant	Collins Street	AU	Melbourne	Australia	NaN	38	[Collins Street, Melbourne VIC, Australia]	[[{"lng": 144.96143363448942, "lat": -37.813979...}	-37.813980	144.961
1	Little Avenue Des Italians Espresso Bar	Café	428 Little Bourke Street	AU	Melbourne	Australia	NaN	105	[428 Little Bourke Street, Melbourne VIC 3000, ...]	[[{"lng": 144.9598, "lat": -37.81399, "label": ...}	-37.813990	144.959
2	Il Tempo	Italian Restaurant	8 Degraives St	AU	Melbourne	Australia	Flinders St	581	[8 Degraives St (Flinders St), Melbourne VIC 3000, ...]	[[{"lng": 144.96593122744065, "lat": -37.817483...}	-37.817484	144.965
3	Map Coffee	Coffee Shop	Elizabeth St	AU	Melbourne	Australia	NaN	373	[Elizabeth St, Melbourne VIC 3000, Australia]	[[{"lng": 144.96162723167922, "lat": -37.810680...}	-37.810681	144.961
4	Maccaroni Trattoria Italiana	Italian Restaurant	10 Manchester Lane	AU	Melbourne	Australia	NaN	478	[10 Manchester Lane, Melbourne VIC 3000, Austr...]	[[{"lng": 144.9658402356701, "lat": -37.8159582...}	-37.815958	144.965
5	osteria italiana	Italian Restaurant	NaN	AU	NaN	Australia	NaN	473	[Australia]	[[{"lng": 144.96583557128906, "lat": -37.815864...}	-37.815865	144.965

Having a look at these data, it is quite clear that Carlton and CBD propose the most important density of Italian restaurants in Melbourne city center. Both districts are also fairly close to Victoria market which is the biggest market in Melbourne and a great place to get fresh products

**2.c : Now let's have a look at some ratings and comments about the restaurants in Carlton and CBD and see if we can get some insight from it**

## Ratings

Carlton: Universal Italian Restaurant

**Rating: 8.3**

Carlton: Gemma Simply Italian

**Rating: 7.8**

Carlton: Bentornato Al Bar Italiano

**Rating: This venue has not been rated yet.**

CBD: Lil Solito Posto Italian

**Rating: This venue has not been rated yet.**

CBD: Il Tempo

**Rating : 6.9**

CBD: Maccaroni Trattoria Italiana

**Rating: 7.8**

CBD: osteria italiana

**Rating: This venue has not been rated yet.**

Looking at the ratings, it seems 'Universal Italian Restaurant' and 'Gemma Simply Italian' in Carlton, 'Maccaroni Trattoria Italiana' in CBD could be potential competitors. Let's now have a look at some comments from the customers



## Comments

Carlton: Universal Italian Restaurant

	text	agreeCount	disagreeCount	id	user.firstName	user.lastName	user.gender	user.id
0	Universal has some of Melbourne's biggest, cheapest and best Italian dishes you can find. It's by far the best value for money place I have found that puts a smile on my face everytime!	5	0	52b1577f498efe9d3286fef5	Richard	Czerwik	male	44701384
1	Chicken schnitzel at \$14 is huge - enough for 2 pax. Seafood Pasta marinara (entree is enough. But can order main portion if big eater) is good 2. These 2 dishes can be shared by 3 pax	2	0	5b5da0412f97ec002cf12c86	pin	lee	female	4621745

Carlton: Gemma Simply Italian

	text	agreeCount	disagreeCount	id	user.firstName	user.lastName	user.gender	user.id
0	Great fresh pasta and gnocchi. Friendly service. Good buzz.	0	0	569a2e28498ec7b137e832b4	Lindsay	R	male	34236212
1	Loved this place, great old charm about the place, fantastic gnocchi, will be back without a doubt.	0	0	5a2876d68b98fd31f8d9264d	Monica	Fulco	female	460006895

CBD: Maccaroni Trattoria Italiana

	text	agreeCount	disagreeCount	id	user.firstName	user.lastName	user.gender	user.id
0	Ossobuco is just the right meal if you're looking to load up on a weighty portion of protein and carbs. Lamb was perfectly cooked and very tasty. I'll visit again. Cappuccino was perfect also.	2	0	5191e414498e59ff672528d3	Wilhelm	Engelbrecht	male	27751025
1	Authentic & delish!!! Gnocci, Lasagne & Chicken Soup (sublime) - excellent staff, friendly & accommodating. Cakes are must. Great to be back...	1	0	56146a71498e3b864e01f96b	Kim	Barry	female	184766

CBD: Il Tempo

	text	agreeCount	disagreeCount	id	user.firstName	user.lastName	user.gender	user.id
0	Ricotta and spinach ravioli with toungue and pumpkin puree was sublime! Everything was super flavoursome and balanced. I'm in love with this place.	2	0	540e6d58498ef052210fa3cc	Cara	Libro	male	94386403
1	Their range of sweet and savory croissants are amazing! The almond one is my favourite, right amount of filling and pastry tastes so fresh!	1	0	5179b6d0e4b088e7a3b5536f	Liliana	NaN	female	362481

From what we can gather it seems all comments are pretty positive. Gnocchi is mentioned 3 times which might indicate that this dish is cherished by Melbournians. Size of portions, quality of service, preparation of coffee are also underlined so those areas might be worth considering when opening a restaurant.

For the rest, it seems both Carlton & CBD could be good locations for a future restaurant. The number of restaurants in each area is somehow identical. The proximity of the Italian Chamber of commerce and Industry, the Centre of Italian studies and the Museo Italiano listed among the Carlton venues indicate this area as being the Italian heart of the city.

As a consequence, the proportion of Italian citizens or people from Italian origin is probably more important in that area. A more refined or authentic cuisine could then be very much appreciated and that would perfectly correspond to the philosophy of the restaurant that we would like to start.

## **CONCLUSION**

All in all, the CBD is the densest and most touristic area in Melbourne while Carlton is the Italian core of the city making both districts a perfect location to start a fine dining Italian restaurant in Melbourne.