

IBM DATA SCIENCE PROFESSIONAL CERTIFICATE

- CAPSTONE PROJECT -

“THE BATTLE OF NEIGHBORHOODS”

FRANCISZEK LISZKA - AUGUST 2021

COPENHAGEN, DENMARK



- OPENING A CAFÉ IN COPENHAGEN -

1. Introduction

1.1 Background

Copenhagen (Danish: *København*) is the capital and most populous city of Denmark. As of 1 January 2021, the city had a population of 799,033. It forms the core of the wider urban area of Copenhagen (population 1,336,982) and Copenhagen metropolitan area (population 2,057,142). Copenhagen is situated on the eastern coast of the island of Zealand, and it is separated from Malmö, Sweden, by the strait of Øresund.

For a number of years, Copenhagen has ranked high in international surveys for its quality of life. Its stable economy together with its education services and level of social safety make it attractive for locals and visitors alike. Although it is one of the world's most expensive cities, it is also one of the most liveable with its public transport, facilities for cyclists and its environmental policies.

1.2 Business problem

There are coffee spots everywhere in Copenhagen, people could not survive without them. Copenhageners simply love cafés. That is the Scandinavian “coffee culture”. Cafés are obviously not only a place where you drink a coffee, but they are also a great place to meet friends and chat, or even do some project, work on something. Nowadays, we’re seeing more and more people working in the cafés, it became some sort of a trend to go to such place with your laptop.

Now, let’s look at the business side, what if someone wanted to open a café in Copenhagen? There’s already so many... does it even make any sense? Are there any places in the city where such a business could potentially bring profit? Let's find some places, where it could be feasible with minimum competition around. I am going to perform the analysis which will help me better understand which parts of the city potentially lack cafés. I am going to use metro stations in Copenhagen as a reference point. Metro stations are the "centers" of the city and their nearby areas are key places when it comes to venues like restaurants or cafes.

1.3 Interest

Anyone who would like to open a café in the Copenhagen area may be interested in this project. The analysis can help small businesses to determine possibly the best place to open a café business in the capital of Denmark.

2. Data

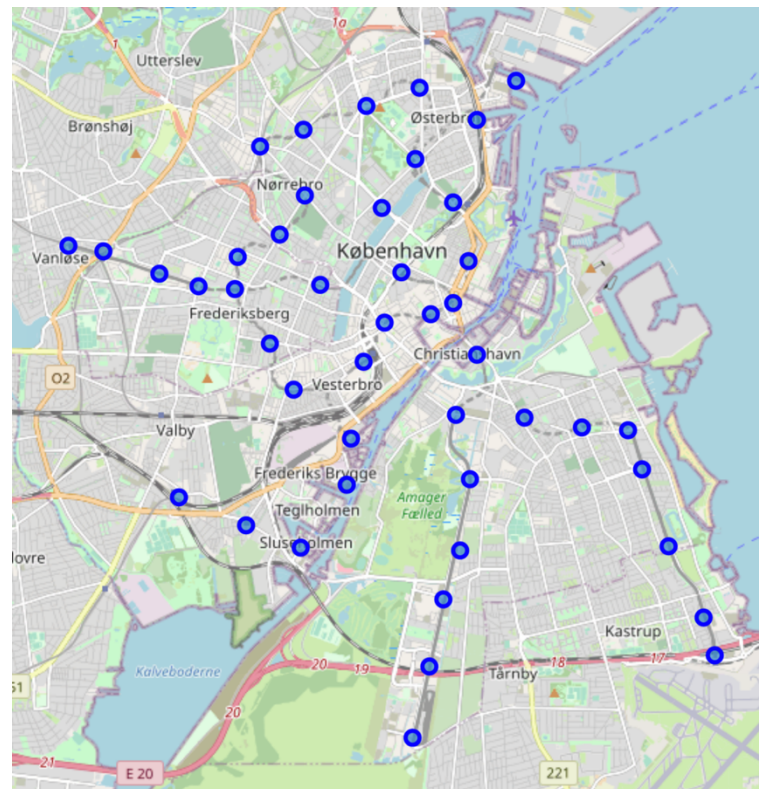
2.1 Data sources

- Copenhagen districts data – Wikipedia [1]
- Metro stations data – Wikipedia [2]
- Geographical coordinates of districts/metro stations – Geocoder Python Library [3]
- Venues by given districts/metro stations – Foursquare API venues method [4]

2.2 Data selection and usage

- I have used Copenhagen metro stations as reference points to analyze the restaurants and cafés that are nearby. At first, I have performed the exact same analysis but with the city districts data. Unfortunately, it wasn't too accurate, and some important parts of the city have been skipped. Therefore, I have decided to use the metro stations and their coordinates. I have also used Python Folium library to draw maps based on the latitude and longitude of each station.

	Metro	Latitude	Longitude
0	Aksel Møllers Have Metro Station	55.685676	12.532425
1	Amager Strand Metro Station	55.656220	12.631530
2	Amagerbro Metro Station	55.663540	12.602700
3	Bella Center Metro Station	55.638270	12.582750
4	Christianshavn Metro Station	55.672160	12.590960
5	DR Byen Metro Station	55.654970	12.589270
6	Enghave Plads Metro Station	55.667410	12.546090
7	Fasanvej Metro Station	55.681560	12.522830
8	Femøren Metro Station	55.645670	12.638070
9	Flintholm Metro Station	55.686580	12.499360
10	Forum Metro Station	55.681821	12.552431
11	Frederiksberg Metro Station	55.681223	12.531719
12	Frederiksberg Allé Metro Station	55.673790	12.540350
13	Gammel Strand Metro Station	55.677760	12.579600
14	Islands Brygge Metro Station	55.663930	12.585740
15	Kastrop Metro Station	55.635780	12.646520
16	København H Metro Station	55.671120	12.563240
17	Kongens Nytorv Metro Station	55.679420	12.585140
18	Lergravsparken Metro Station	55.662170	12.616670
19	Lindenvang Metro Station	55.683471	12.513120



- I have used Foursquare API venues methods in order to get venues that are situated nearby. That means that I have obtained every venue within the distance of 700 meters of each station.

	Metro	Latitude	Longitude	VenueName	VenueId	VenueLatitude	VenueLongitude	VenueDistance	VenueCategory
0	Aksel Møllers Have Metro Station	55.685676	12.532425	The Coffee Collective	4fd89c20e4b04c778275e9f7	55.686960	12.533222	151	Coffee Shop
1	Aksel Møllers Have Metro Station	55.685676	12.532425	Mad & Kaffe	5b0eb642646e38002ca932b0	55.686826	12.531717	135	Café
2	Aksel Møllers Have Metro Station	55.685676	12.532425	Da Claudio	4bc0a819920eb713a340192c	55.686901	12.532269	136	Italian Restaurant
3	Aksel Møllers Have Metro Station	55.685676	12.532425	Gastronomia Candido	4be2f38f1dd22d7f604095bd	55.687325	12.530107	234	Pizza Place
4	Aksel Møllers Have Metro Station	55.685676	12.532425	Emmerys Godthåbsvej	536ba331498efec3da567aa3	55.686362	12.534116	130	Bakery
...

- I have used the venues data in various ways, the main goal was to get the number of certain venues nearby each station in order to notice the possible lack of cafés, comparing for example with the number of restaurants nearby.

	Metro	Coffee Shop	Café	Italian Restaurant	Pizza Place	Bakery	Pool	Ramen Restaurant	French Restaurant	Library	...	Fried Chicken Joint	Lawyer	Beach Bar	Bowling Alley	Buffet	Frozen Yogurt Shop
0	Aksel Møllers Have Metro Station	2	7	3	2	6	1	1	2	1	...	0	0	0	0	0	0
1	Amager Strand Metro Station	1	2	0	0	1	0	0	0	0	...	0	0	0	0	0	0
2	Amagerbro Metro Station	6	1	0	3	6	1	0	0	0	...	0	0	0	0	0	0
3	Bella Center Metro Station	0	0	0	2	0	0	0	0	0	...	0	0	0	0	0	0
4	Christianshavn Metro Station	2	5	2	0	3	0	0	0	1	...	0	0	0	0	0	0
5	DR Byen Metro Station	0	1	0	2	0	0	0	0	0	...	0	0	0	0	0	0
6	Enghave Brygge Metro Station	0	2	1	0	1	0	0	0	0	...	0	0	1	1	0	0
7	Enghave Plads Metro Station	5	7	2	4	4	0	1	1	0	...	0	0	0	0	0	0
8	Fasanvej Metro Station	2	1	1	2	0	1	1	1	1	...	0	0	0	0	0	0
9	Femøren Metro Station	0	0	0	0	0	0	0	0	0	...	0	0	0	0	0	0

References:

- [1] [Category: Districts of Copenhagen](#)
- [2] [Copenhagen Metro Stations](#)
- [3] [Python Geocoder Library](#)
- [4] [Foursquare API](#)

3. Methodology

more to come... work in progress...