Capstone Project – Neighbourhoods of Denmark (1st part)

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1 INTRODUCTION

This project was completed as part of the IBM Data Science Professional Certificate and makes up the Applied Data Science Capstone Project "The Battle of Neighbourhoods".

In this project, location data from Foursquare must be leveraged to explore and compare neighbourhoods or cities in a geographical location and in the end come up with an answer to a made-up business-related problem.

1.1 THE BUSINESS PROBLEM

This section introduces the considered business problem and the target audience that would be interested in the project.

A newly started Danish restaurant franchise are experiencing great success with their first restaurant located in the city of Kongens Lyngby[1]. The franchise is so successful that they are now considering opening another restaurant. The question however is, which other cities are they most likely to experience similar success in? To answer such question, a comparison analysis of the various Danish cities/neighbourhoods are needed. The client wants to know which Danish cities resembles Kongens Lyngby the most and thereby gives them the best chances of repeating their initial success.

After thorough discussions with the client it was clarified that in this relation resembling means cities with a similar selection of local venues.

The scope of this neighbourhood analysis is for now limited to other Danish cities, as the franchise is still very young and because the client believe part of their success is related to the Danish nationality.

Carrying out this analysis is crucial for this young franchise as a poor initial decision could easily ruin the future of the franchise.

The target audience of this analysis are stakeholders of the existing restaurant and possible future owners/investors.

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[1] Kongens Lyngby is with its population of approx. 55,500 one of the larger suburbs to Copenhagen (the capital of Denmark) and an important shopping destination among the northern suburbs [1].

2 DATA DESCRIPTION

This section contains a description of the data, together with its sources, and how it will be used to solve the problem.

In this project the Foursquare location data are the primary source of information. However, to know which geographical locations to lookup a secondary dataset, containing all of Denmark's postal codes and region names, is used in combination with the GeoPy library leveraging OpenStreetMap data.

The Foursquare location data is retrieved by use of their free to use Places API with a personal developer account [2], while the Danish postal codes are downloaded from Edemann.dk [3].

A snippet of the dataset containing the Danish postal codes and region names are shown below.

PostalCode	Neighbourhood
1301	København K
2000	Frederiksberg
2100	København Ø
2200	København N
2300	København S

Figure 1 A few samples from the dataset containing the Danish postal codes and region names.

The neighbourhood/region names are being used to look up their respective coordinates using the GeoPy library. Finally, the neighbourhood coordinates are used to look up all the local venues and their respective categories using the Foursquare Places API.

A snippet of the resulting dataset containing the neighbourhood name and location together with the venue name, category and location are shown below.

Neighbourhood	Neighbourhood Latitude	Neighbourhood Longitude	Venue	Venue Category	Venue Latitude	Venue Longitude
Kongens Lyngby	55.771865	12.505141	Sticks'n'Sushi	Sushi Restaurant	55.770193	12.505784
Kongens Lyngby	55.771865	12.505141	Det Sunde Køkken	Fast Food Restaurant	55.769333	12.505093
Kongens Lyngby	55.771865	12.505141	Wokshop	Thai Restaurant	55.769113	12.505265
Kongens Lyngby	55.771865	12.505141	Big Mamas Pizza House	Pizza Place	55.770937	12.499931
Kongens Lyngby	55.771865	12.505141	Magasin Lyngby	Department Store	55.770190	12.505017
Kongens Lyngby	55.771865	12.505141	Meyers Spisehus	Diner	55.769801	12.505433
Kongens Lyngby	55.771865	12.505141	Gordion Café og Restaurant	Pizza Place	55.767780	12.501952
Kongens Lyngby	55.771865	12.505141	Kinopalæet	Movie Theater	55.771272	12.507214
Kongens Lyngby	55.771865	12.505141	Lyngby Storcenter	Shopping Mall	55.771932	12.505966
Kongens Lyngby	55.771865	12.505141	Lyngby Shawarma	Middle Eastern Restaurant	55.771102	12.506972

Figure 2 Foursquare nearby venue data.

3 METHODOLOGY

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4 RESULTS

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5 DISCUSSION

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6 CONCLUSION

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7 REFERENCES

[1]   Wiki page https://da.wikipedia.org/wiki/Kongens_Lyngby

[2]   Foursquare Developer site https://developer.foursquare.com

[3]   Edemann site https://edemann.dk/liste-danske-postnumre-og-byer/