Asian Restaurants in Manchester

DATA SCIENCE CAPSTONE

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Introduction

Manchester has proven itself to not only be one of the most important economic areas within the UK and Europe, but it also contains one of the most thriving food and drink scenes within the UK. Throughout the course of this report I am going to provide some basic data analysis which shows how the number of restaurants differs by each area within Manchester.

Business Problem

Manchester is a huge area and therefore has lots of potential in terms of where best to open a given restaurant. There is the thriving Manchester city center, fast-growing Salford and even lesser known areas with huge populations such as Trafford. Choosing where is best to open a given restaurant could be overwhelming, but overall comes down to a few things. The prevalence of similar restaurants already within the neighborhood, is a good indicator which could show the potential of success, and is what is going to be the primary focus of this project. Asian restaurants are going to the focus, due to limitations with API requests.

Data

A combination of data sources are going to be used. Firstly the primary data source is going to be from Foursquare, and an API is going to request information which is going to contain restaurant specific enquiries, along with general location data for each restaurant. Before delving into that some preliminary web scraping is going to be conducted from Wikipedia in order to gain some understanding of the areas within Manchester as well as gain some extra location data, such as a written town instead of just a postcode. These data sets will be joined in order to gain a comprehensive overview of restaurants by local area.

Methodology

The first objective is to create a data set containing all local areas within Manchester along with some latitude and longitude points. The postcode will also be an important attribute within this data frame since this is going to allow a join with the restaurant data from the from the Foursquare API.

The Foursqaure API is going to contain data which highlights specific restaurants and certain attributes surrounding them including location. This will aid in the data analysis intended to solve the business problem previously set out. Once this data frame has been created and successfully cleaned, and joined with the location data frame I will make plots in order to draw conclusions.

Results

The first port of call was to create a data frame containing location data for all areas across Manchester. In the picture below you see the first 5 rows within the data-frame along with a more detailed description such as coverage. This data frame is important as it will add a layer of complexity to analysis, which will lead to a more informed eventual decision.

	Post town	Coverage	Local authority area(s)	latitude	longitude
M1	MANCHESTER	Piccadilly, City Centre, Market Street	Manchester	53.47734	-2.23508
M2	MANCHESTER	Deansgate, City Centre	Manchester	53.48003	-2.24263
M4	MANCHESTER	Ancoats, Northern Quarter, Strangeways	Manchester	53.48455	-2.22909
M5	SALFORD	Ordsall, Seedley, Weaste, University	Salford	53.47903	-2.28482
M6	SALFORD	Pendleton, Irlams o' th' Height, Langworthy, S...	Salford	53.49159	-2.29696

The next step was to create a data frame which shows individual restaurant data from the Foursquare API. Given the nature of the project I submitted five separate category id's that which falled inline with the business problem. After a lot of cleaning, the first five rows of the resultant data frame is pictured below

	id	name	category	postcode	location.lat	location.lng
0	5b6e368ee97dfb002cefffc7	Buba Noodle Bar	Vietnamese Restaurant	M1	42.993649	-71.461946
1	4be436f878e895211b8b64ce	Koi Japan	Japanese Restaurant	M1	42.991822	-71.463434
2	4f323e0e19836c91c7c43e13	Pete's Dragon	Chinese Restaurant	M1	42.995411	-71.451573
3	5c0c62fb916bc1002b85ab3b	Noodz	Asian Restaurant	M1	42.991959	-71.463383
4	4b3bd473f964a5200c7c25e3	Thousand Crane	Chinese Restaurant	M1	42.992562	-71.463390

Combining the data frame from the Foursqare data and the more detailed location data from the Wikipedia page you get the following resultant data frame, where the first five rows are displayed once again.

	id	name	category	location.lat	location.lng	Post town	Coverage	Local authority area(s)	latitude	longitude
M1	5b6e368ee97dfb002cefffc7	Buba Noodle Bar	Vietnamese Restaurant	42.993649	-71.461946	MANCHESTER	Piccadilly, City Centre, Market Street	Manchester	53.47734	-2.23508
M1	4be436f878e895211b8b64ce	Koi Japan	Japanese Restaurant	42.991822	-71.463434	MANCHESTER	Piccadilly, City Centre, Market Street	Manchester	53.47734	-2.23508
M1	4f323e0e19836c91c7c43e13	Pete's Dragon	Chinese Restaurant	42.995411	-71.451573	MANCHESTER	Piccadilly, City Centre, Market Street	Manchester	53.47734	-2.23508
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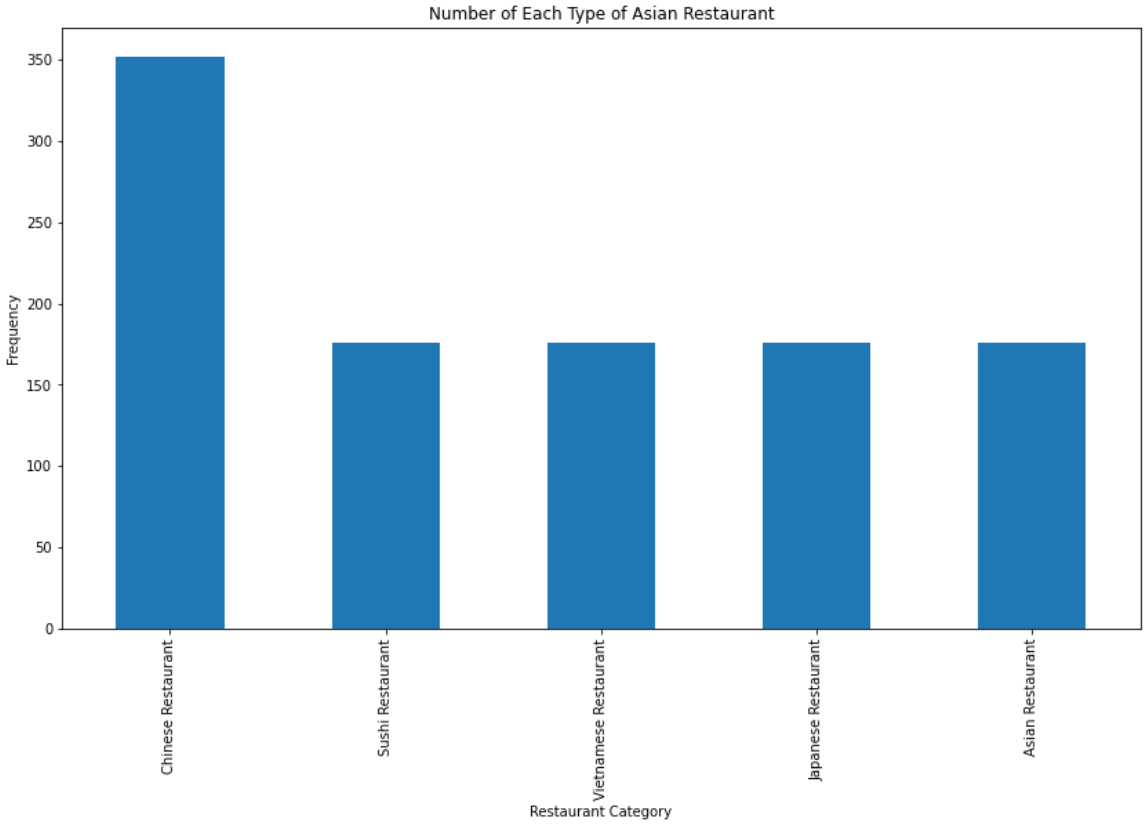
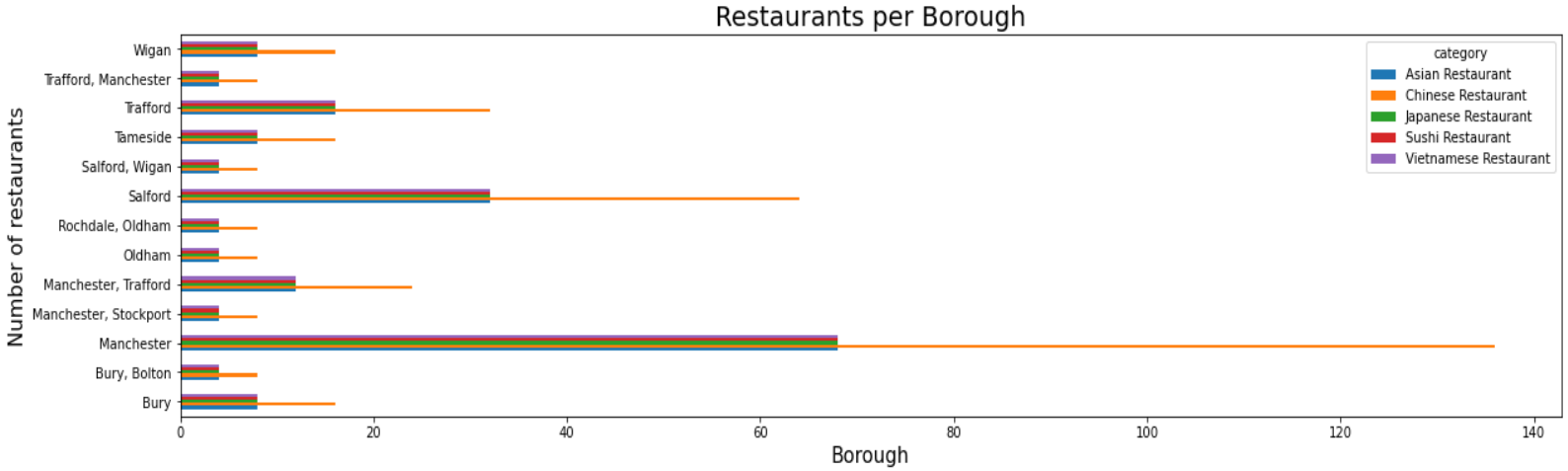
M1	4b3bd473f964a5200c7c25e3	Thousand Crane	Chinese Restaurant	42.992562	-71.463390	MANCHESTER	Piccadilly, City Centre, Market Street	Manchester	53.47734	-2.23508

Following this data analysis can be performed. I plotted two simple but highly relevant graphs which could help in determining how best to tackle the business problem.



This simple bar chart shows the frequency of each type of restaurant. I have split it by category since an individual may want to discover which cuisine is the most popular

within the local area and therefore provides the best business opportunity. From the above graph it is clear that Chinese restaurants are by far the most popular type of Asian restaurant when considering the Manchester area as a whole. This could mean it is the best opportunity, however it could also suggest that the market is saturated. Interestingly all other types of Asian restaurants seem to be pretty equal in frequency within Manchester as a whole, and therefore could be considered as all equally viable.



Here we have a bar chart which shows the frequency of each type of restaurant by local area. Interestingly the distributions of Chinese restaurants to other types are roughly the same for each area compared to the graph showing the frequency of each category for Manchester as a whole. Nevertheless, it is clear that the "Manchester" area, which in this case is referring to the city center is by far the most viable location given the already thriving restaurant scene which is at least double that of any other area within Manchester as a whole. Although Salford also presents a good opportunity with the second largest frequencies for each restaurant type.

Recommendation

Further market analysis would need to be conducted in order to best choose which restaurant type and location. Basing the decision purely of frequencies, opening a Chinese restaurant within Manchester City Centre would provide the best opportunity given the already large number of similar businesses there. However, competition is certainly a factor that needs to be considered along with restaurant ratings within Manchester, and how successful each of these restaurants actually are.