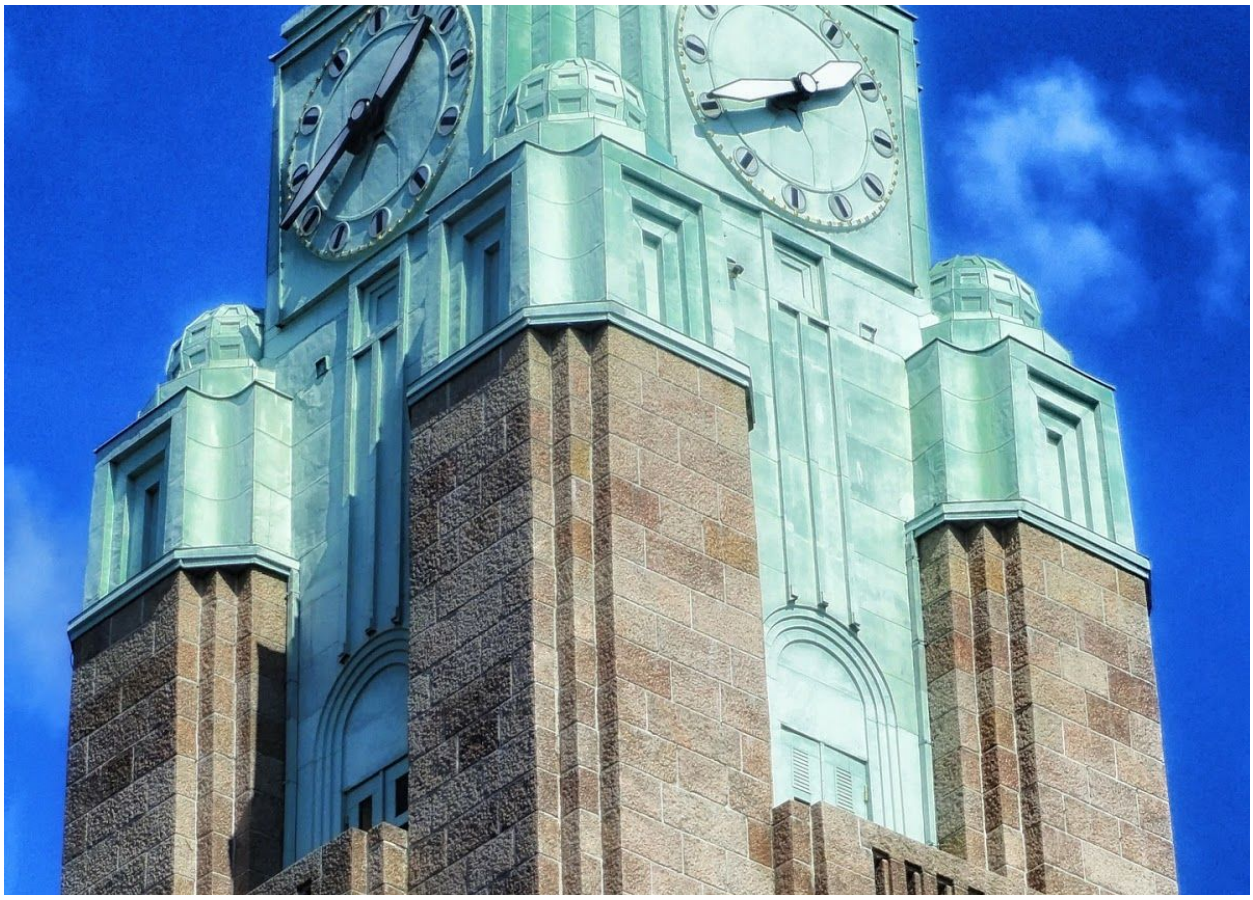
Applied Data Science Capstone

Chain restaurant opportunities at greater Helsinki mass transit hubs

Pauli Hannola, April 9th, 2019



Introduction

In this project, I looked for the types of restaurants and cafes that were underrepresented in the vicinities of popular mass transit hubs in and around the city of Helsinki, Finland. I specifically chose four such hubs, Helsinki Central Railway station, Helsinki Bus Station, Pasila Railway Station and Helsinki Airport, because of their relative closeness to each other and their high volume of daily passenger throughput.

The data I collected would be of interest to possible new investors interested in starting up a brand new chain of restaurants or cafes, and also owners and franchisers of existing chains looking to expand their operations in Finland.

Data

I started by using the GeoPy client's Nominatim geocoder to access OpenStreetMap's data and find out the geographical coordinates of my chosen four target locations.

Helsinki Central station	60.1713198, 24.9414566
Helsinki bus station	60.1685348, 24.9304942
Pasila railway station	60.197873, 24.9322653
Helsinki airport	60.32135905, 24.9472068000384

Utilizing these coordinates, I then used the Foursquare API's explore endpoint to get lists of 100 venues closest to each of the four locations. I also used the same API to get a list of all possible types of restaurants and related types of venues they track.

Methodology

The initial explore endpoint query I used for each hub provided me with a lot of data about each venue, as seen in Figure 1.

	name	categories	address	cc	city	country	crossStreet	distance	formattedAddress	labeledLatLngs	lat	lng	neighborhood	postalCode	state	id
0	Habitat Helsinki	Furniture / Home Store	Kaivokatu 8	FI	Helsinki	Suomi	NaN	203	[Kaivokatu 8, 00100 Helsinki, Suomi]	[{'label': 'display', 'lat': 60.16955676588021...	60.169557	24.942441	NaN	00100	Uusimaa	54702b87498e96a8900e105b
1	Suomen Kansallisteatteri	Theater	Läntinen Teatterikuja 1	FI	Helsinki	Suomi	Rautatientori	183	[Läntinen Teatterikuja 1 (Rautatientori), 0010...	[{'label': 'display', 'lat': 60.17251, 'lng': ...	60.172510	24.943740	NaN	00100	Uusimaa	4adcdb22f964a520666021e3
2	Ateneum	Art Museum	Kaivokatu 2	FI	Helsinki	Suomi	NaN	171	[Kaivokatu 2, 00100 Helsinki, Suomi]	[{'label': 'display', 'lat': 60.17030164536989...	60.170302	24.943788	NaN	00100	Uusimaa	4adcdb23f964a520af6021e3
3	Fantasiapelit	Hobby Shop	Kaivopiha	FI	Helsinki	Suomi	NaN	213	[Kaivopiha, 00100 Helsinki, Suomi]	[{'label': 'display', 'lat': 60.16946082452627...	60.169461	24.940527	NaN	00100	Uusimaa	4bd59544cfa7b71327fc25da
4	Pien Shop & Bar	Beer Store	Ateneuminkuja 2	FI	Helsinki	Suomi	NaN	249	[Ateneuminkuja 2, 00100 Helsinki,	[{'label': 'display', 'lat': 60.16967317676566...	60.169673	24.944526	NaN	00100	Uusimaa	57ab4c95498ef8003be05e61

Figure 1

Since I was interested only in the categories of the venues and the total amount of each type of venue present, I dropped the other data and made a new dataframe with just the venue category and count. Figures 2 and 3 show the full results of this operation for the Helsinki Central station data.

Figures 2 & 3 [next page]

	categories
Café	7
Clothing Store	6
Coffee Shop	5
Bakery	3
Wine Bar	3
Furniture / Home Store	3
Art Museum	3
Burger Joint	3
Hawaiian Restaurant	2
Restaurant	2
Boutique	2
Park	2
Gym	2
Theater	2
Hotel	2
Plaza	2
Beer Bar	2
Modern European Restaurant	2
Dance Studio	2
Juice Bar	2
Brewery	2
Health Food Store	2
Outdoor Supply Store	2
Moroccan Restaurant	1
Pizza Place	1
Yoga Studio	1
Art Gallery	1
Miscellaneous Shop	1
Pool	1
Movie Theater	1
Hobby Shop	1
Wine Shop	1
Scandinavian Restaurant	1
Seafood Restaurant	1
Salad Place	1
Electronics Store	1
Smoothie Shop	1
Circus	1
Shoe Store	1
Arts & Crafts Store	1
Kids Store	1
Hotel Bar	1
Department Store	1
Beer Store	1
Falafel Restaurant	1
Performing Arts Venue	1
Men's Store	1
IT Services	1
Concert Hall	1
Indian Restaurant	1
Malay Restaurant	1
Supermarket	1
Organic Grocery	1
Filipino Restaurant	1
Cocktail Bar	1
Toy / Game Store	1
Bookstore	1
Gym / Fitness Center	1
Gift Shop	1
Vegetarian / Vegan Restaurant	1

I repeated the process for each target location. Figures 4, 5 and 6 show the top five categories for Helsinki bus station, Pasila railway station and Helsinki airport, respectively.

	categories
Scandinavian Restaurant	5
Café	4
Chinese Restaurant	3
Art Museum	3
Wine Bar	3

Figure 4

	categories
Sandwich Place	1
Health Food Store	1
Coffee Shop	1
Thai Restaurant	1
Massage Studio	1

Figure 5

	categories
Airport Service	12
Airport Lounge	5
Coffee Shop	4
Scandinavian Restaurant	3
Hotel	2

Figure 6

At this point, I collated these four dataframes into just one. I noticed that the final dataframe included places that are outside the scope of my project, such as Arts & Crafts Store, Hotel and Massage Studio, which I had to remove manually. The resulting dataframe now looked like Figure 7.

Figure 7 [next page]

	categories
Asian Restaurant	2.0
Bakery	5.0
Bar	1.0
Beer Bar	3.0
Beer Store	1.0
Bistro	1.0
Brewery	3.0
Burger Joint	4.0
Burrito Place	1.0
Café	12.0
Chinese Restaurant	3.0
Cocktail Bar	3.0
Coffee Shop	12.0
Deli / Bodega	1.0
Dumpling Restaurant	1.0
Falafel Restaurant	2.0
Fast Food Restaurant	2.0
Filipino Restaurant	2.0
Fish & Chips Shop	1.0
Food Court	2.0
French Restaurant	1.0
Gourmet Shop	1.0
Hawaiian Restaurant	3.0
Himalayan Restaurant	1.0
Hot Dog Joint	2.0
Indian Restaurant	2.0
Irish Pub	1.0
Japanese Restaurant	3.0
Juice Bar	3.0
Malay Restaurant	2.0
Mexican Restaurant	1.0
Middle Eastern Restaurant	1.0
Modern European Restaurant	2.0
Moroccan Restaurant	2.0
Pastry Shop	1.0
Pet Café	1.0
Pizza Place	4.0
Pub	1.0
Restaurant	4.0
Salad Place	1.0
Sandwich Place	3.0
Scandinavian Restaurant	9.0
Seafood Restaurant	2.0
Smoothie Shop	2.0
Sushi Restaurant	2.0
Tea Room	1.0
Thai Restaurant	3.0
Vegetarian / Vegan Restaurant	2.0
Vietnamese Restaurant	2.0
Wine Bar	7.0

Since I was looking for venue types with minimal competition, I decided to drop the types with 3 or more venues already present near the target areas. This produced the first part of my results, a list of 33 venue types with only a little competition.

The second part of the results would be a list of the types with zero venues present. For this I needed the list of all venue types that Foursquare supports. From this list, I removed all the types that appeared in our previous results (specifically, a version of that result from before I dropped the venue types with 3 or more occurrences). The result of this operation was a list of 79 venue types with no current competition in the areas.

Results

The 33 venue types with only 1 or 2 competitors in the four target locations total:

Asian Restaurant, Bar, Beer Store, Bistro, Burrito Place, Deli / Bodega, Dumpling Restaurant, Falafel Restaurant, Fast Food Restaurant, Filipino Restaurant, Fish & Chips Shop, Food Court, French Restaurant, Gourmet Shop, Himalayan Restaurant, Hot Dog Joint, Indian Restaurant, Irish Pub, Malay Restaurant, Mexican Restaurant, Middle Eastern Restaurant, Modern European Restaurant, Moroccan Restaurant, Pastry Shop, Pet Café, Pub, Salad Place, Seafood Restaurant, Smoothie Shop, Sushi Restaurant, Tea Room, Vegetarian / Vegan Restaurant and Vietnamese Restaurant.

The 79 venue types with no current competitors in the target locations:

Afghan Restaurant, African Restaurant, American Restaurant, Australian Restaurant, Austrian Restaurant, BBQ Joint, Bagel Shop, Beach Bar, Beer Garden, Belgian Restaurant, Breakfast Spot, Bubble Tea Shop, Buffet, Cafeteria, Cajun / Creole Restaurant, Caribbean Restaurant, Caucasian Restaurant, Champagne Bar, Comfort Food Restaurant, Creperie, Czech Restaurant, Dessert Shop, Diner, Dive Bar, Donut Shop, Dutch Restaurant, Eastern European Restaurant, English Restaurant, Fondue Restaurant, Food Stand, Food Truck, Fried Chicken Joint, Friterie, Gastropub, Gay Bar, German Restaurant, Gluten-free Restaurant, Greek Restaurant, Halal Restaurant, Hookah Bar, Hotel Bar, Hungarian Restaurant, Italian Restaurant, Jewish Restaurant, Karaoke Bar, Kebab Restaurant, Latin American Restaurant, Lounge, Mac & Cheese Joint, Mediterranean Restaurant, Molecular Gastronomy Restaurant, Night Market, Nightclub, Other Nightlife, Pakistani Restaurant, Polish Restaurant, Portuguese Restaurant, Poutine Place, Russian Restaurant, Sake Bar, Scottish Restaurant, Slovak Restaurant, Snack Place, Soup Place, Southern / Soul Food Restaurant, Spanish Restaurant, Speakeasy, Sports Bar, Sri Lankan Restaurant, Steakhouse, Strip Club, Swiss Restaurant, Theme Restaurant, Tiki Bar, Truck Stop, Turkish Restaurant, Ukrainian Restaurant, Whisky Bar and Wings Joint.

Discussion

My original plan included only the data of the venues that exist near the areas, but during the coding process I realized the results would be incomplete without the list of "zero venues" as well. From a business standpoint, though, these would require additional market research to see if there is demand for them in the first place, especially seeing as how many of these are themed around a particular nationality or region. In this sense the types on the first list are a safer bet, as they are already operating in the area. Of course a diligent business person should see if they can find out more details, such as how long these places have operated and whether or not they are turning a profit.

The data here could be expanded in many ways, especially into areas such as the profitability and size of the different operating venues and also the history of the types of venues that have existed in the past, as the Foursquare data only pertains to currently operational businesses.

During the writing of this report I also noticed a part of my methodology that I could have improved upon. Instead of manually deleting non-restaurant types of venues from my dataframe for the list appearing in Figure 7, I could've compared the list against the list of all types straight from the Foursquare API and automatically removed the non-useful types. I estimate the potential for saved time to have been in the neighborhood of about 10 to 20 minutes, had I realized this earlier.

Conclusion

In this study I identified several underrepresented types of restaurants and cafes near four of the biggest passenger transit hubs in and around the Finland's capital city of Helsinki. This data could be of interest to investors and restauranteurs who are looking to open more locations or expand their operations from outside of Finland.