

Exploring Singapore's food culture at MRT Interchanges





Note

Please see the accompanying **report** for detailed explanation. This presentation is focused on the resulting visualization



Introduction





Background

Singapore's Mass Rapid Transport (MRT) is well connected, and is one of the main transport modes in the country. In 2019, the average daily ridership is at 3.384 million, which is about half the population of Singapore. Like any country, going out for food and drinks is common and is a part of the culture where people spend time catching-up with each other, or just trying out new places. Similarly, businesses are also changing, and new ones are appearing.



Problem Area

Singapore is a small country and business competition is high. For both business owners and customers, there are too many options to choose from, or compete against. For this project, we will determine the top 10 food and drinks places located around major MRT interchanges, and then cluster these places together to determine what makes these area different.



Target Audience

Hopefully, this observation can help new business owners understand the landscape just a little more before they startup, as well as to help customers pick their next outing



Scope

For the purpose of this project, MRT interchanges are the main train networks that connect 2 or more other MRT networks, and excludes those that connect to Light Rail Transits stations, reason being they are mostly located at residential areas, which is not our target geography



Data



Data

The datasets required for this analysis are:

1. List of MRT interchanges and its latitude and longitude. The source can be found in [data.world](#) and has the features required: Stn_name, Stn_no, Latitude, Longitude,
2. Data for busiest MRT interchanges. [Mytransport.sg](#) provides monthly ridership statistics, however the data needs to be understood further before using, as it records the entry and exits of the station gantries instead of the passenger count.
3. Nearby venues from Foursquare. We will be using the `explore` API endpoint to source for venues near each of the MRT interchange



Methodology





Data Cleaning

The data exploration is divided into a few stages:

1. Identifying MRT Interchanges
2. Cleaning data for busiest interchanges
3. Getting nearby venues from Foursquare
4. Clustering



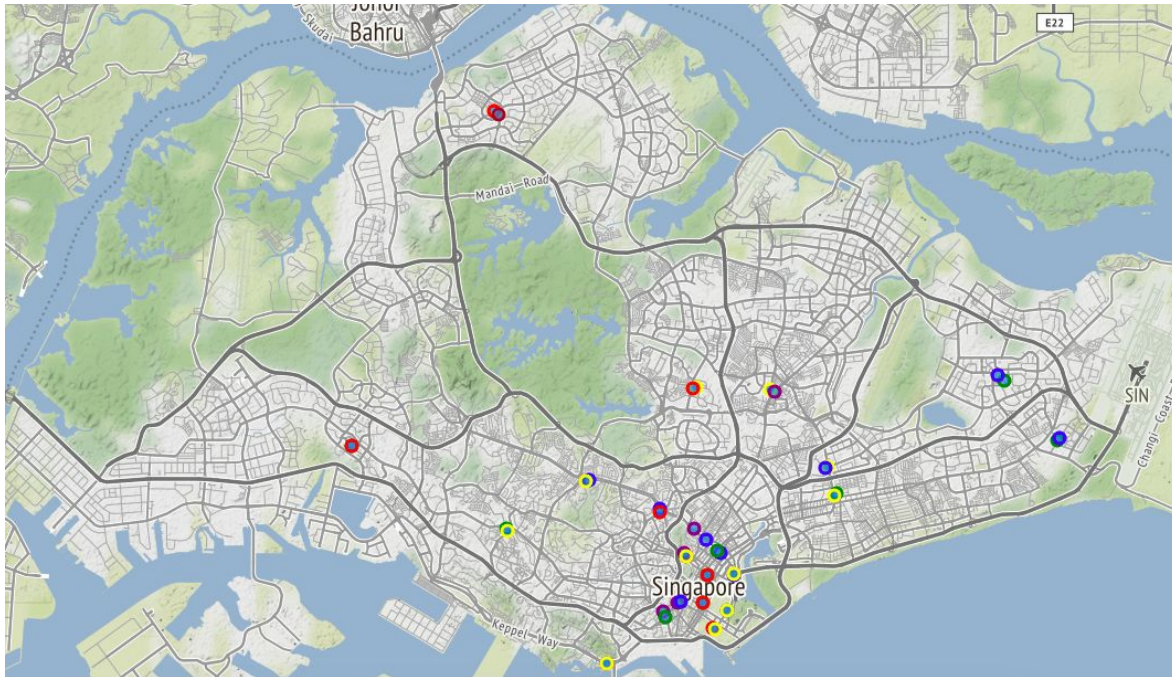
Identifying MRT Interchanges

After data is cleaned, we have a dataset with the Station Name, its location and color. The original dataset has multiple MRT Station rows per Interchange. We will see that in the next slide.

	STN_NAME	STN_NO	LATITUDE	LONGITUDE	COLOR	IS_INTERCHANGE
0	BAYFRONT MRT STATION	DT16	1.281874	103.859073	blue	True
1	BAYFRONT MRT STATION	CE1	1.281874	103.859073	others	True
2	BISHAN MRT STATION	CC15	1.351309	103.849150	yellow	True
3	BISHAN MRT STATION	NS17	1.350839	103.848140	red	True
4	BOTANIC GARDENS MRT STATION	DT9	1.322424	103.816136	blue	True
5	BOTANIC GARDENS MRT STATION	CC19	1.322110	103.814988	yellow	True
6	BUGIS MRT STATION	DT14	1.299551	103.856862	blue	True
7	BUGIS MRT STATION	EW12	1.300465	103.855701	green	True
8	BUONA VISTA MRT STATION	EW21	1.307183	103.790203	green	True
9	BUONA VISTA MRT STATION	CC22	1.306492	103.790665	yellow	True

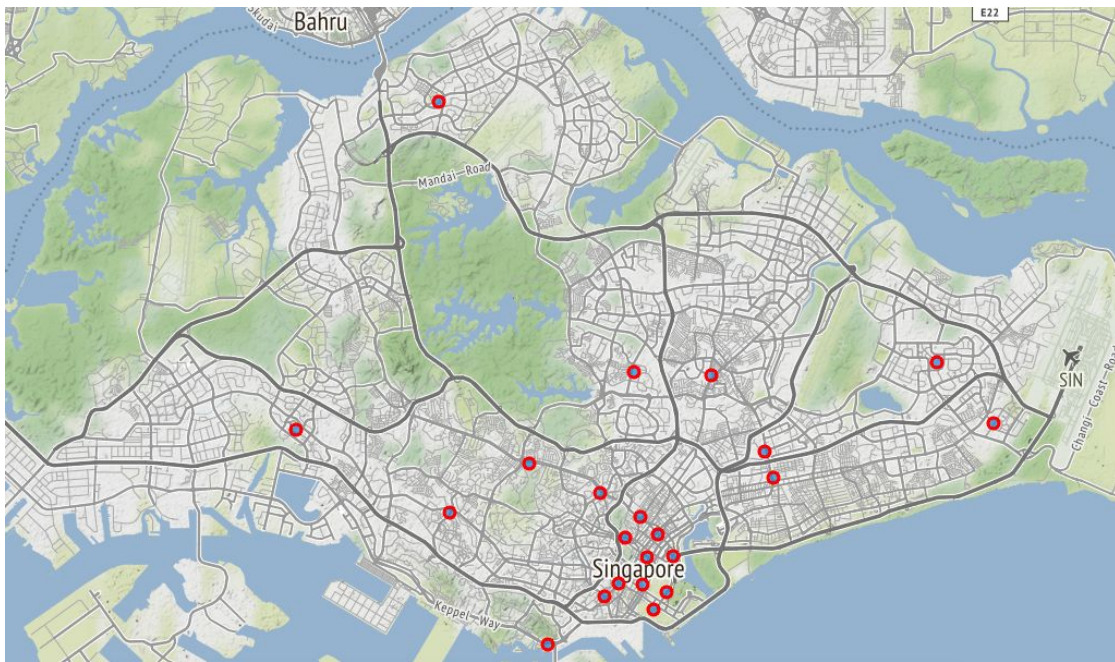
Identifying MRT Interchanges

The raw data is plotted using Folium. These colors below shows the various MRT stations connected at each interchange



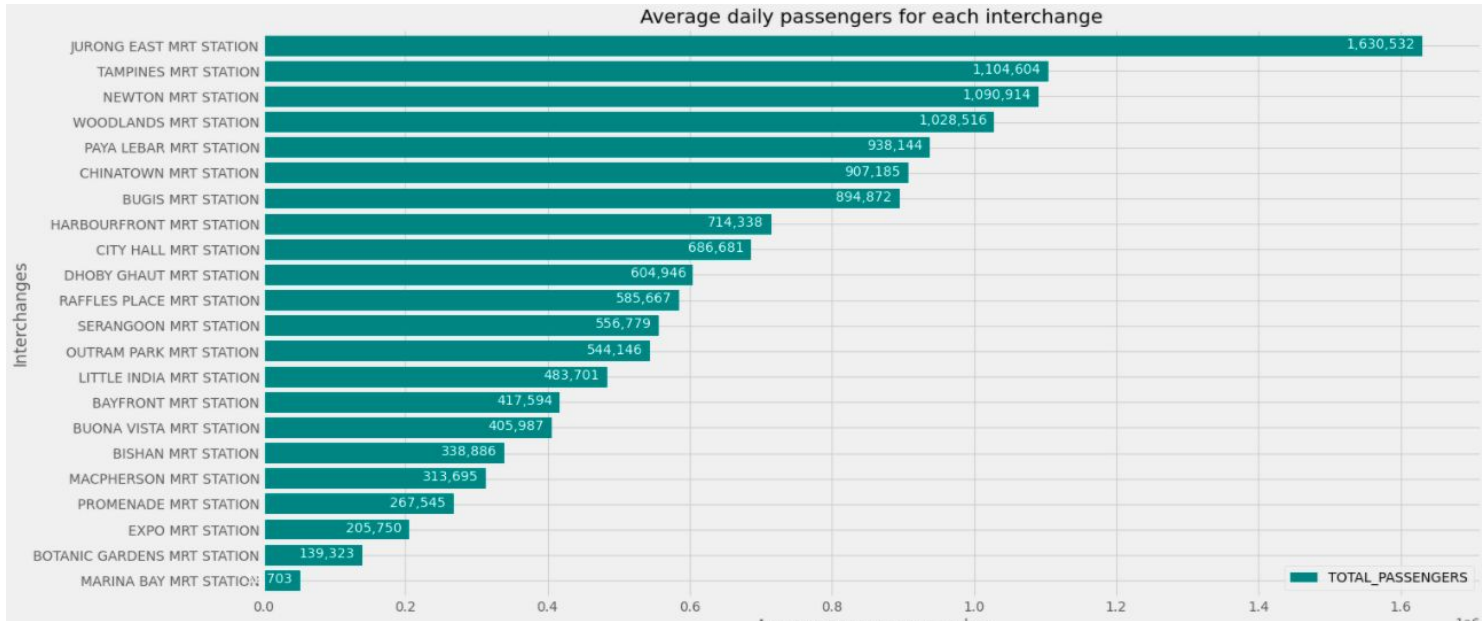
Identifying MRT Interchanges

The individual MRT Stations are merged together to create single Interchange locations. These are plotted on a map again. We now have 22 Interchanges



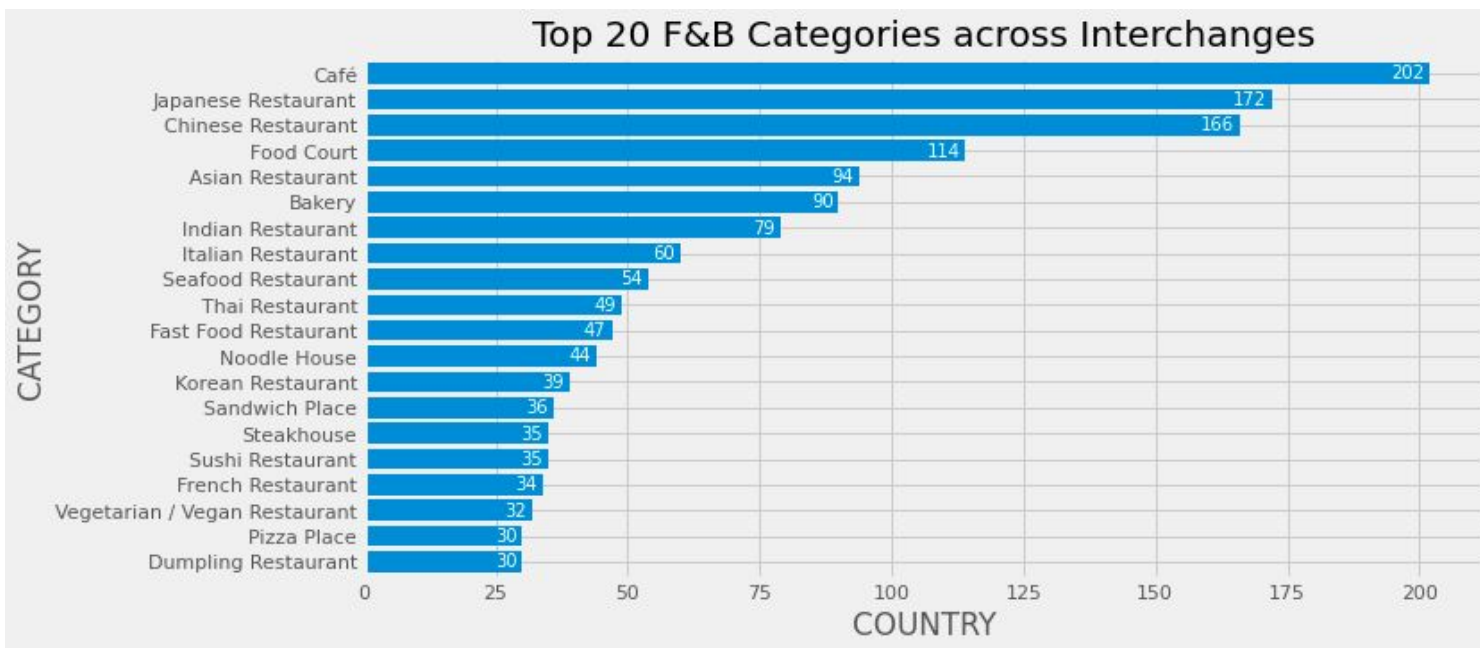
Busiest Interchanges

Jurong East is the busiest interchange with 1.6million daily passengers and Marina Bay being the least busiest with only 52.7K daily passengers



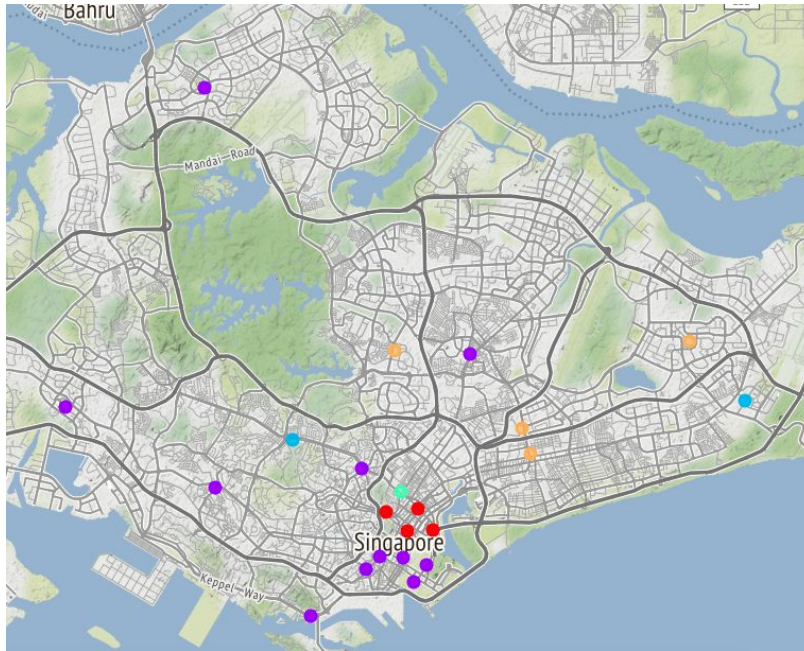
Getting nearby venues from Foursquare

The chart shows the Top 20 venue categories across all 22 interchanges. We can see Cafe culture is very popular in Singapore.



Category Clusters

KMeans was used to create 5 clusters of venue categories across the 22 interchanges.



Cluster	Color	Description
1	Red	<p>These 4 interchanges are close to the city center.</p> <p>Japanese Restaurants and Cafes are the 2 most common categories, followed by Chinese Restaurant and Bakery being the 3rd most common category</p>
2	Purple	<p>These interchanges are considered busy as well as they connect to other major lines. We can see that it includes the busiest interchange in Singapore, which is Jurong East - the purple dot furthest to the left.</p> <p>Japanese Restaurants and Cafes are still 2 most common but they are paired with other categories, such as Cafe + Bakery, or, Japanese + Bakery. Additionally, we see a number of Food Courts as 3rd most common categories</p>
3	Blue	For this cluster, Cafe and Chinese restaurants are the 2 most common categories
4	Green	This is perhaps the most popular single cluster. The Little India MRT Station is an interchange and probably has the highest number of Indian restaurants here
5	Orange	The last cluster contains mostly Food Courts, Chinese, and Asian Restaurants as the 3 most common categories. It is likely that these interchanges are further away from the city and closer to residential areas, and food courts are usually common in residential areas.



Description of generated clusters



Conclusion



In the Top 20 Categories chart in the previous, we can clearly see that Cafes, Japanese Restaurants, Chinese Restaurant, and Food Courts are highly common in the 1,963 venues we pulled from FourSquare.

It's quite clear that Cafe culture is really strong in Singapore - many new young and 'hipster' cafes are popping in the recent years. However, as a resident in Singapore myself, I'm quite surprised to see that there are so many Japanese restaurants here. Chinese Restaurants are not surprising, seeing that it is quite a common local cuisine here, and lastly, Food Courts are almost a symbol here in Singapore, serving cheap food across multiple cuisines. In general, Asian cuisines (Jap, Thai, Korean, Chinese) are very common around the interchanges. For western cuisines such as French, Italian, and others, they are available but not as common around these interchanges. Perhaps, a good opportunity for new business owners.

In terms of interchanges - as discussed earlier, Jurong East is the busiest station and it's high public housing concentration could mean we can potentially do a follow-up analysis for Jurong East township, and see what is available in this area. Marina Bay has very low traffic due to its location near the business district, which has a low residency population, and low traffic on weekends, and perhaps new business should stay away from this area unless their business model can support working-hours traffic only.