CORRELATION BETWEEN SINGAPORE HOUSING PRICES AND ITS POPULAR VENUES

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SINGAPORE — THE CITY STATE

Singapore is a city-state 'small island country' in the South East Asia, often referred as 'The Little Red Dot', for its tiny size on the world map.

Singapore has population of 5.6million and density of 7,804 people/km^2.

SINGAPORE – HOUSING IN THE STATE

Singapore is placed highly in key social indicators: education, healthcare, quality of life, personal safety and housing, with a home-ownership rate of 90%.

Housing Development Board (HDB) is the authorized autonomous body builds residential estates and affordable flats.
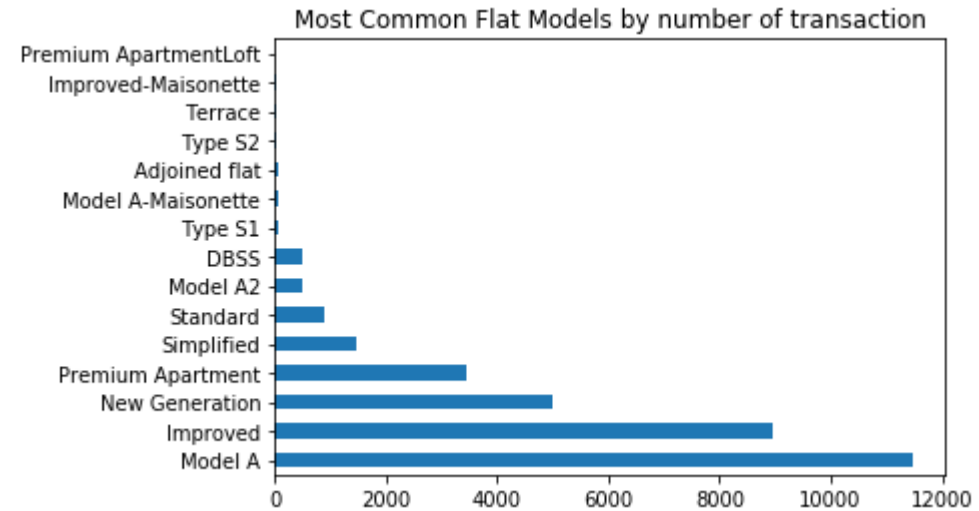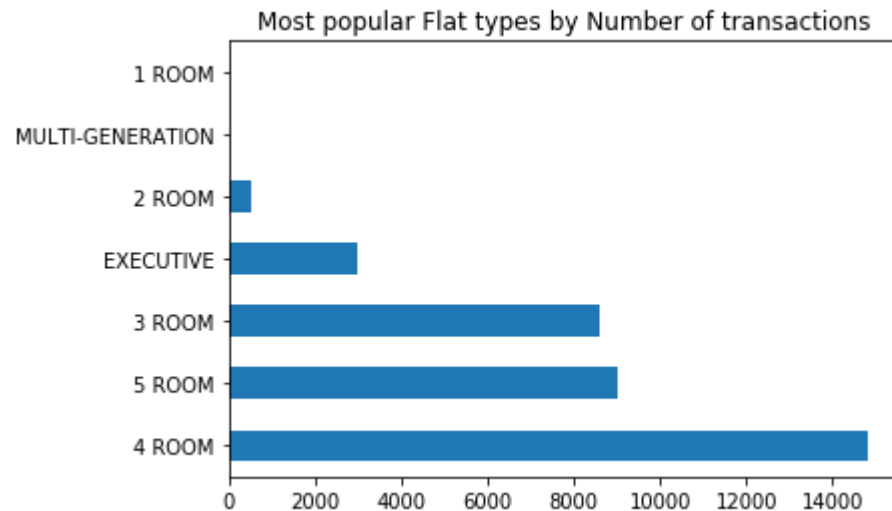
SINGAPORE – HOUSING PRICES

Housing market in Singapore is a volatile one which has its ups all the way until the downs hit in year 2013. Only Citizen and the Permanent Resident Card holders are allowed to own HDB flats.


QUARTER
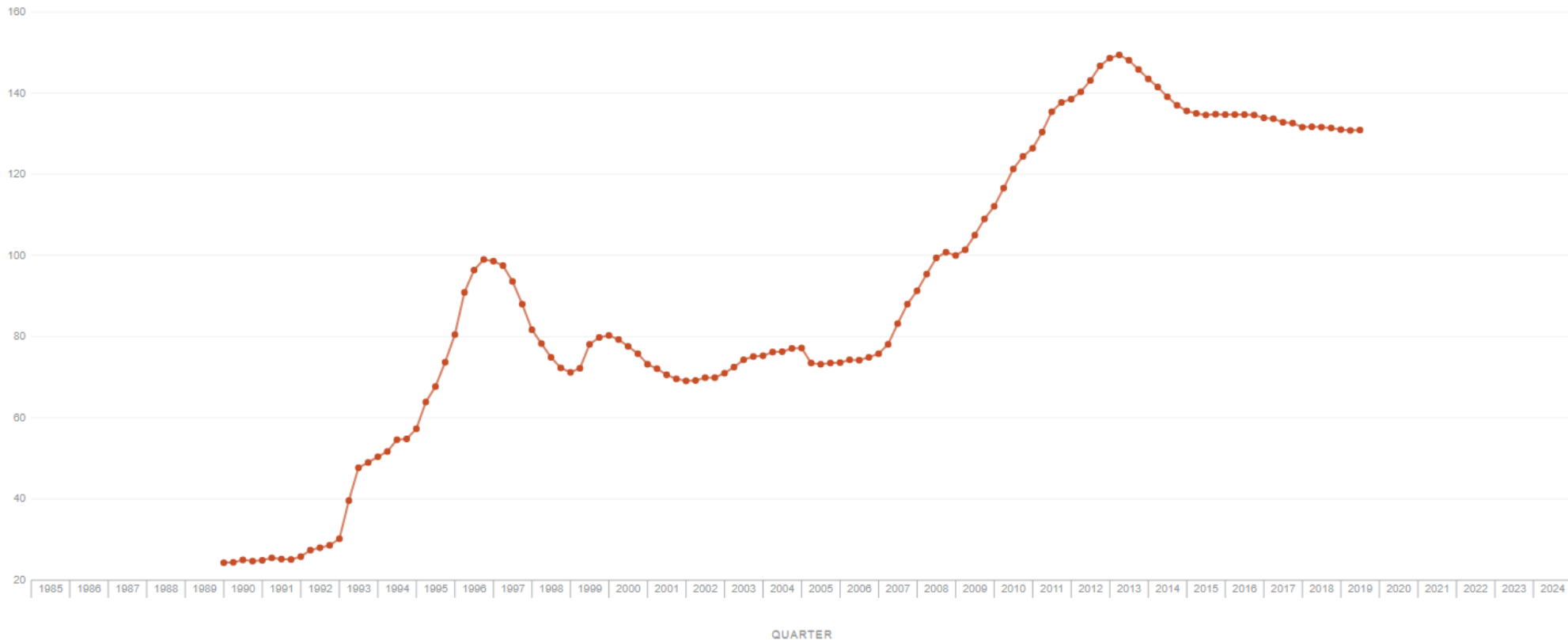
SINGAPORE – HOUSING PRICE ANALYSIS

'Flat Type' and 'Flat Models' are two important features of a HDB flat. Type describes the number of rooms (or floor area) and Model describes the layout design.

4 Room is the most popular Type and Model A is the most popular Flat Model among Singapore HDB home owners.

SINGAPORE – HOUSING PRICE ANALYSIS

Flat type has linear effect in the house price with floor area. Similarly 'Model' has and effect but non proportional.
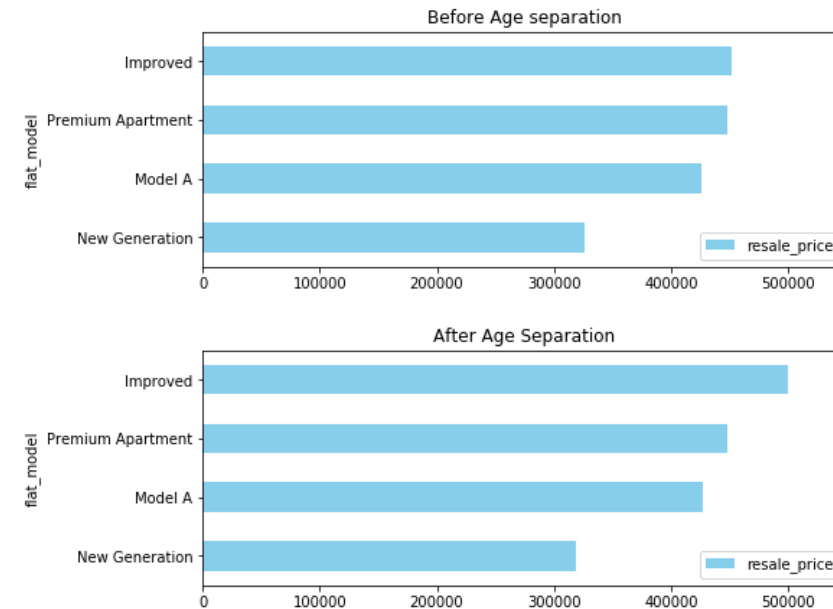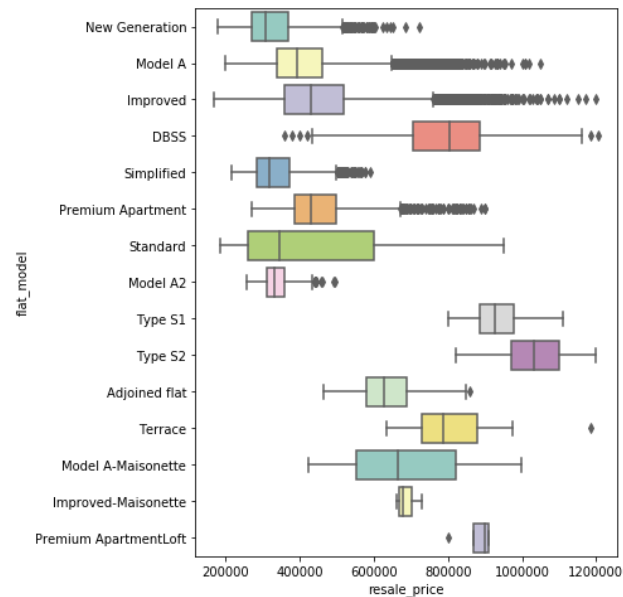
In Singapore buying a HDB flat only gives ownership of 99 years. Once the flat reach 35 years the maximum allowed bank loan amount drops to 65% from 85%. This leads to a depreciation and lower demand. The study has omitted data for HDB flats older than 35 years.
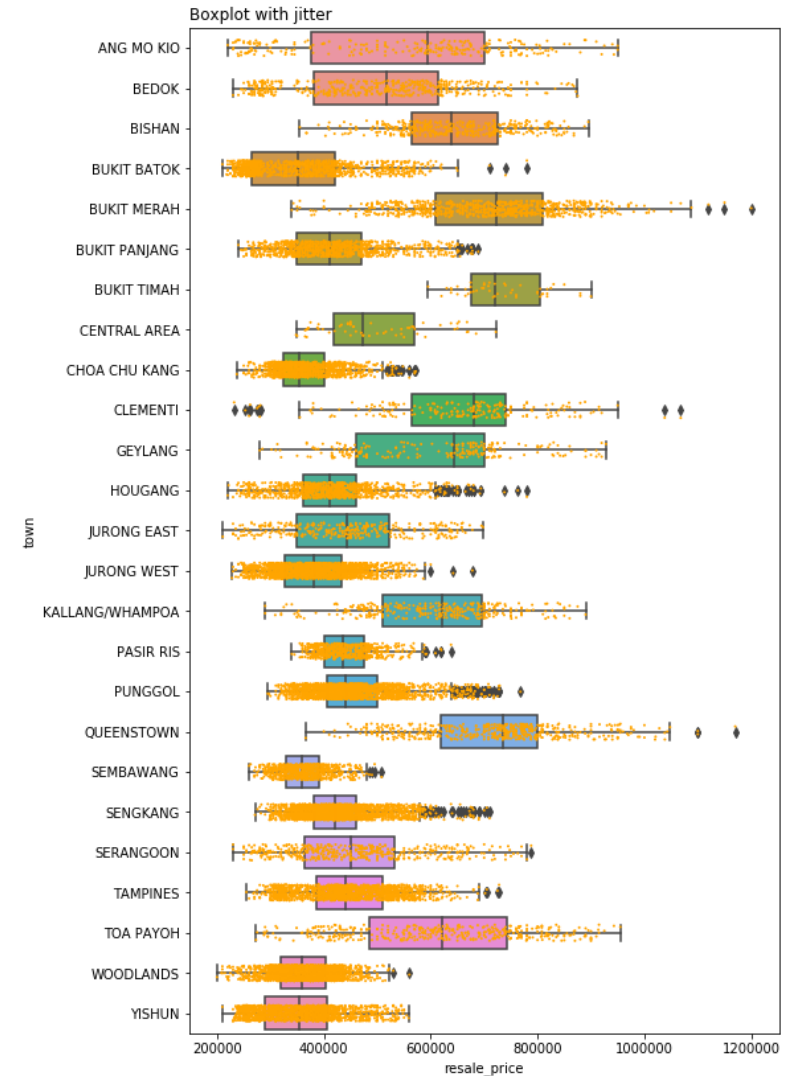
SINGAPORE – HOUSING PRICE ANALYSIS

Singapore has 26 towns among which Marine Parade is not really a residential town.

The resale data from HDB shows the price distribution of HDB flats among the towns in Singapore.

The Flat types chosen to plot are 3 Room, 4 Room and 5 Room

Flat Models selected are Model A, Improved, Premium Apartment and New Generation.

SINGAPORE – HOUSING PRICE ANALYSIS RESULT

The analysis result shows Bukit Batok, Yishun, Choa Chu Kang, Sembawang and Woodlands are the most affordable towns with respect to housing price.

The price plotted is the median value of all transaction valuations completed from 1 January 2018 onwards.

This data is after necessary optimization, cleaning, filtering and feature tuning.

Median Flat Resale Price by Towns
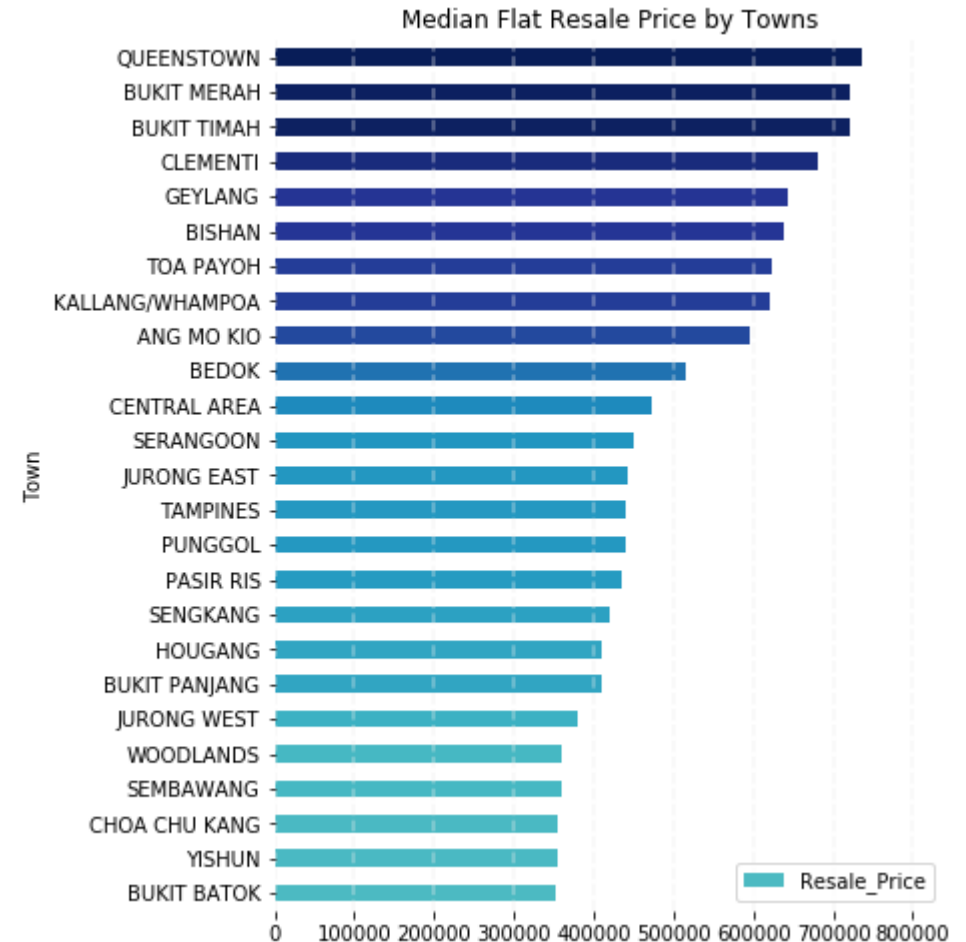
SINGAPORE – TOWN EXPLORATION

The analysis further expanded to find the correlation of the pricing of HDB flats by towns with popular venues nearby.
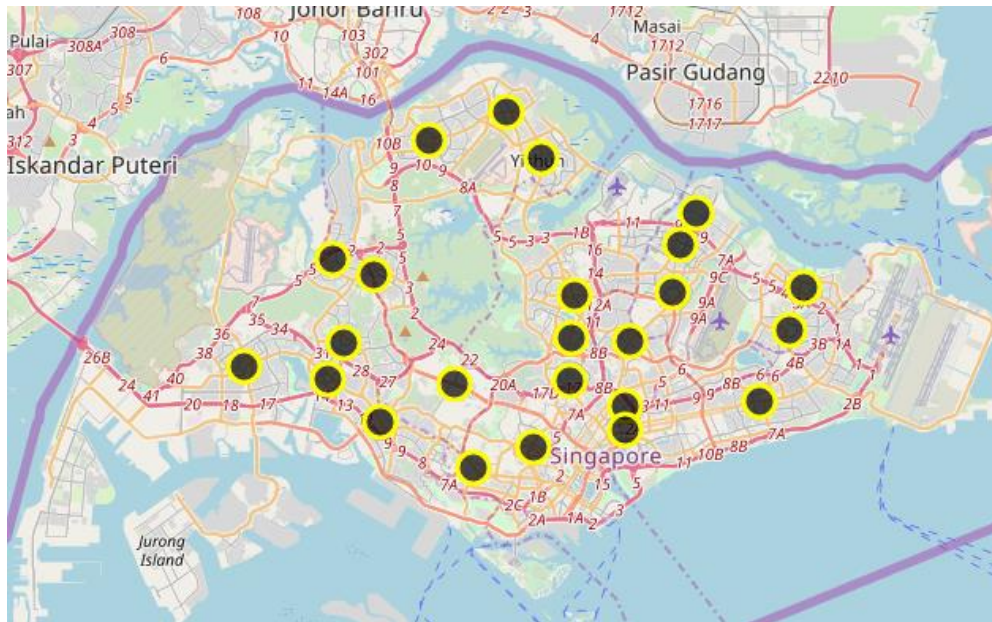

```
----ANG MO KIO----
              venue  freq
0        Food Court  0.17
1       Coffee Shop  0.08
2       Supermarket  0.03
3 Convenience Store  0.03
4       Dessert Shop  0.03

----BEDOK----
                venue  freq
0         Coffee Shop  0.11
1  Chinese Restaurant  0.07
2          Food Court  0.06
3                Café  0.05
4   Asian Restaurant  0.04

----BISHAN----
                venue  freq
0          Food Court  0.08
1         Coffee Shop  0.08
2  Chinese Restaurant  0.07
3       Cosmetics Shop  0.06
4      Thai Restaurant  0.06
```

```
----BUKIT BATOK----
                   venue  freq
0             Food Court  0.19
1     Chinese Restaurant  0.10
2            Coffee Shop  0.10
3  Fast Food Restaurant  0.07
4          Grocery Store  0.07

----BUKIT PANJANG----
                   venue  freq
0            Bus Station  0.10
1  Fast Food Restaurant  0.06
2            Coffee Shop  0.06
3      Asian Restaurant  0.06
4                   Park  0.04

----BUKIT TIMAH----
                    venue  freq
0     Seafood Restaurant  0.07
1                 Bakery  0.06
2      Indian Restaurant  0.06
3   Japanese Restaurant  0.06
4     Italian Restaurant  0.04
```

```
----CENTRAL AREA----
                   venue  freq
0               Boutique  0.12
1                  Hotel  0.06
2   Japanese Restaurant  0.05
3       Sushi Restaurant  0.05
4    Chinese Restaurant  0.05

----CHOA CHU KANG----
                   venue  freq
0  Fast Food Restaurant  0.12
1      Asian Restaurant  0.06
2           Coffee Shop  0.06
3           Golf Course  0.06
4           Supermarket  0.04

----CLEMENTI----
                   venue  freq
0            Food Court  0.08
1    Chinese Restaurant  0.07
2      Asian Restaurant  0.05
3           Coffee Shop  0.04
4     Indian Restaurant  0.04
```

Using Foursquare API queries, most popular venues were identified

SINGAPORE – TOWN CLUSTERING RESULT

Though Singapore is small in area and towns are incredibly close to each other, they can be clustered based on the popular venues with K-means algorithm.
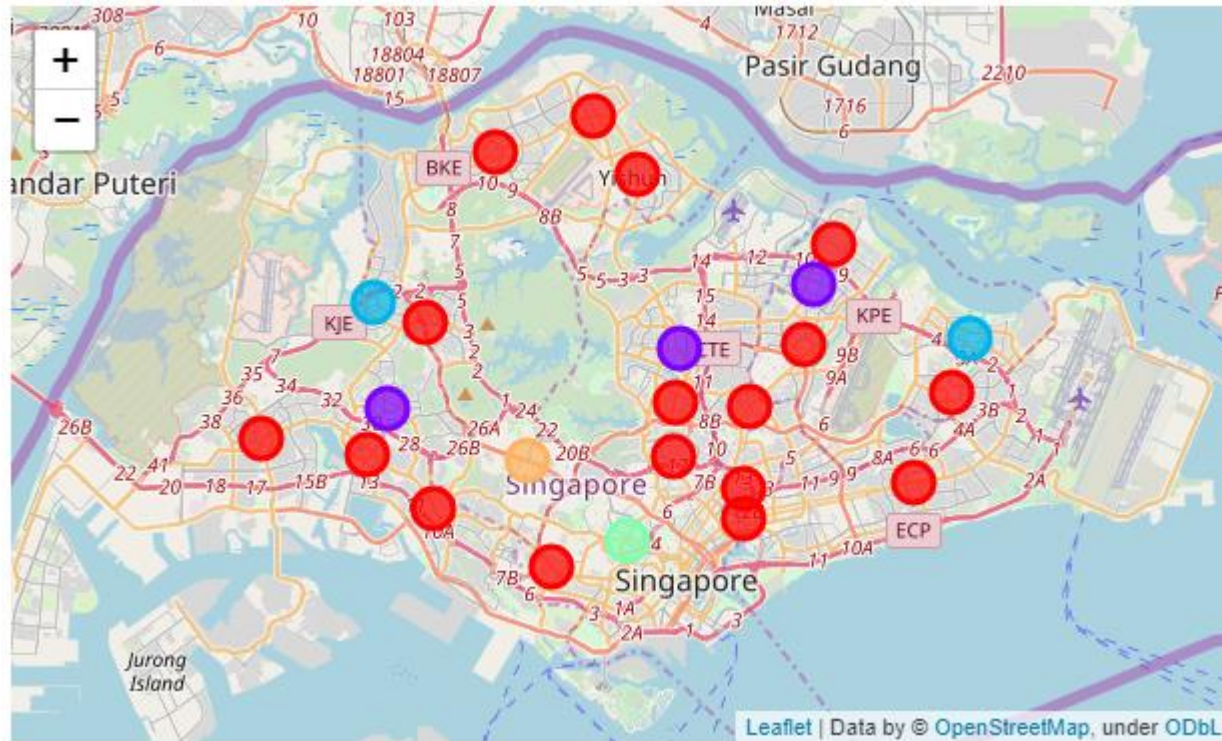
SINGAPORE – TOWNS CONCLUSION

Most of Singapore's towns has identical venues.

Foursquare API queries results mostly food outlets and eateries as most popular venues.

Essential facilities like hospitals, markets, sports facilities might have a better correlation with housing price than popular Foursquare venues.

Plotting with proper geojson formats on choropleth map might be visually better appealing.

For now it can only conclude that the distance from Singapore City Center is the major factor deciding the median price of an HDB flat in Singapore.

Further possible features has to be identified for future analysis.