

HDB Resale Price Analysis

22 Mar 2025



Meet the WOW! Team



**Shilpa
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Big Boss



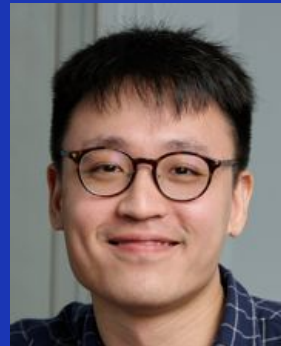
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Project Manager



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Data Analyst #2



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Data Analyst #3

Who are interested in HDB resale flat prices?





Loving Daughter #1

Excellent relationship with parents; Wishes to own flat near them in Tampines area



Chic Lady #2

Looking to upgrade on current 5-room flat to an Executive dwelling; Wishes to understand the lowest possible price differential between the two flat types before selling



Unlucky Husband #3

Failed three BTO ballots; As pregnant wife is already in third trimester, he wishes to locate the cheapest 4-room resale flat available in Singapore where amenities are prevalent



Opportunist #4

BTO flat has completed 5-year Minimum Occupation Period (MOP); Intends to sell flat at maximum profit

We Have All Heard These...

- “My flat is just freshly out of MOP - the highest selling price is now”
- “My flat is in a popular town and is right next to the MRT and a big shopping mall - it should therefore be worth a lot”
- “I read, in the news, that other sellers sold a similar unit to mine for record-breaking S\$XXX, hence my unit should command a similar price”
- “My unit is able to see Malaysia and the sunset! Such picturesque views are worth their weight in gold”



WOW! Agents

Looking to pinpoint key contributing factors for HDB resale price differentials

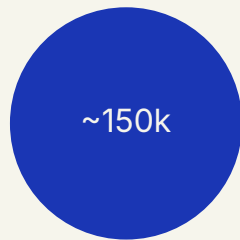
What is HDB resale flat price influenced by?



Quick Facts: HDB Resale Market (2012 - 2021)



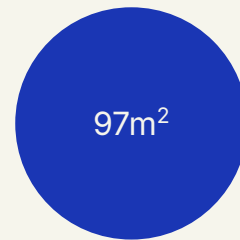
Avg. price



No. of flats sold



Avg. age of flat
at time of
transaction



Avg. floor area



Year with the
most
transactions

Data Limitations

Data Ends at End-2021

Lack of up-to-date information might affect real-time predictions

Null Values

Presence of null values in certain data columns; Have to align interpretation across the board and supply dummy values to replace

Data beyond Sold Resale

To analyse resale flat prices accurately, we need the prices of adjacent / substitute goods (e.g. other types of housing, listed prices for unsold flats currently in-market, etc.)

Analysis Assumptions

First-Time Buyer / Seller

Transactions were borne out of genuine relocation purposes, not as investment vehicles

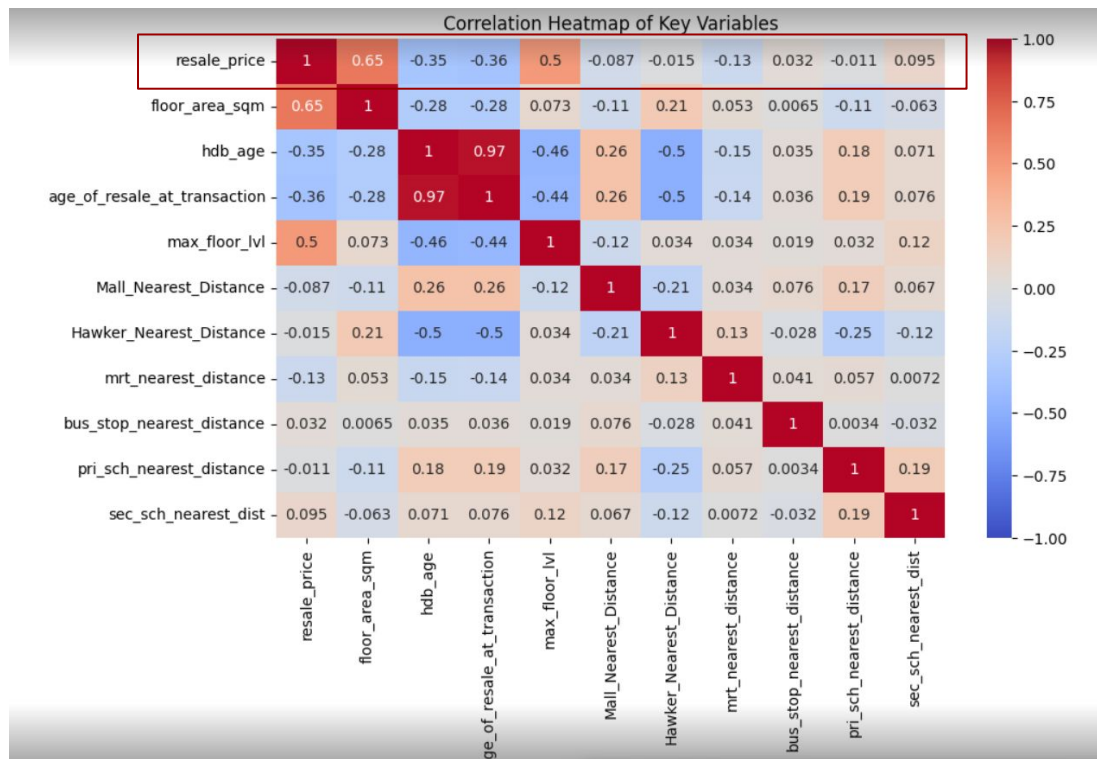
Amenities = Equal Quality

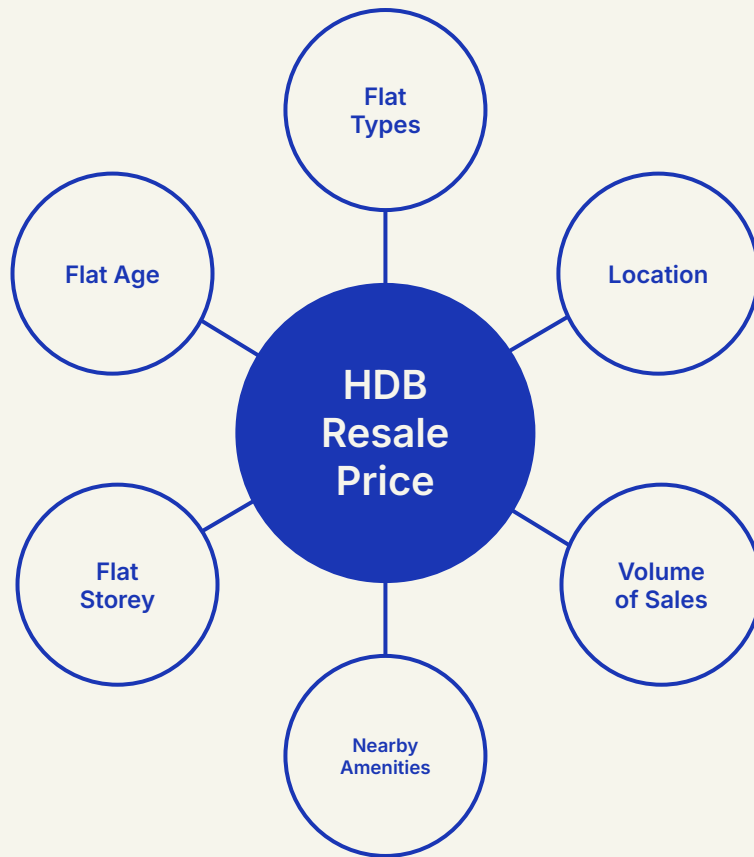
Dunman Secondary School
=
Dunman High School

Adjacent Real Estate

Non-HDB units in the area do not directly influence HDB resale prices

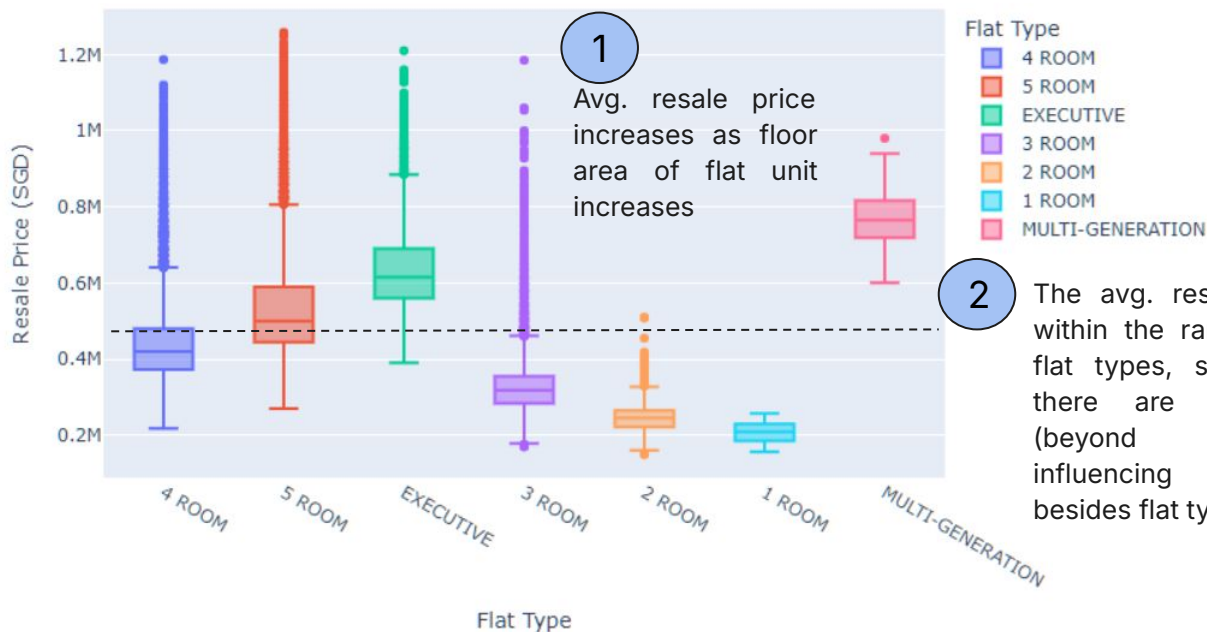
Full Correlation Matrix





Establishing correlation between flat types and resale price

HDB Resale Price Distribution by Flat Type

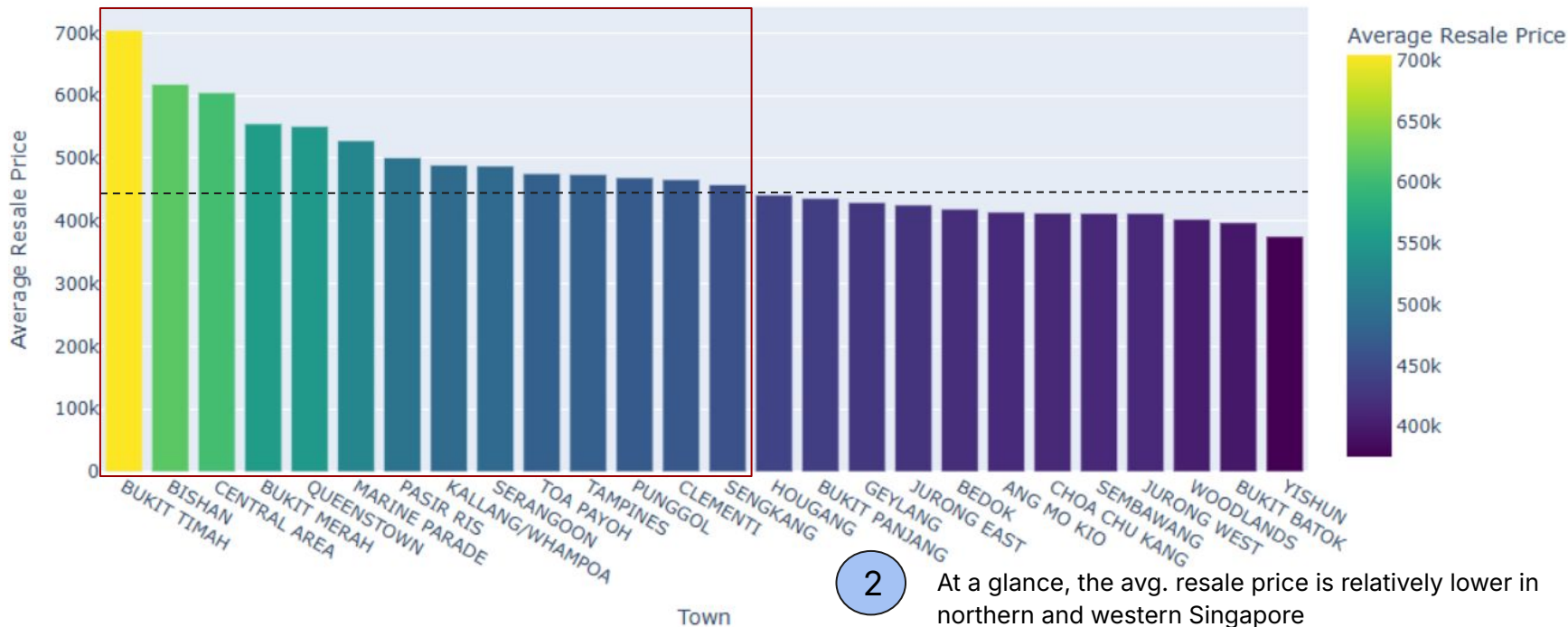


Resale prices based on location

Average Resale Price by Town

1

Avg. resale prices differ based on the town the HDB flat is in

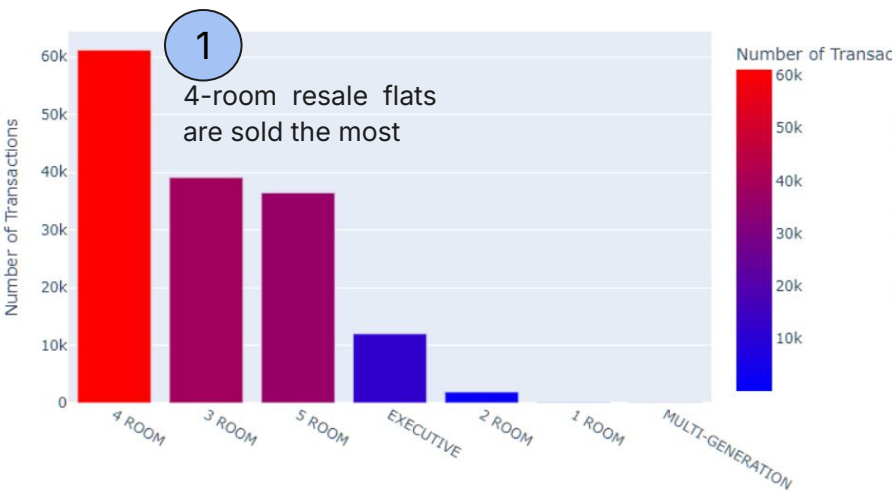


2

At a glance, the avg. resale price is relatively lower in northern and western Singapore

Volume of sales of HDB flat types

Volume of HDB Flat Types in Resale Market



HDB Resale Volume Over Time by Flat Type



Separately, we notice that there is a dip in Feb of each year - the dip is most significant in Feb 2013

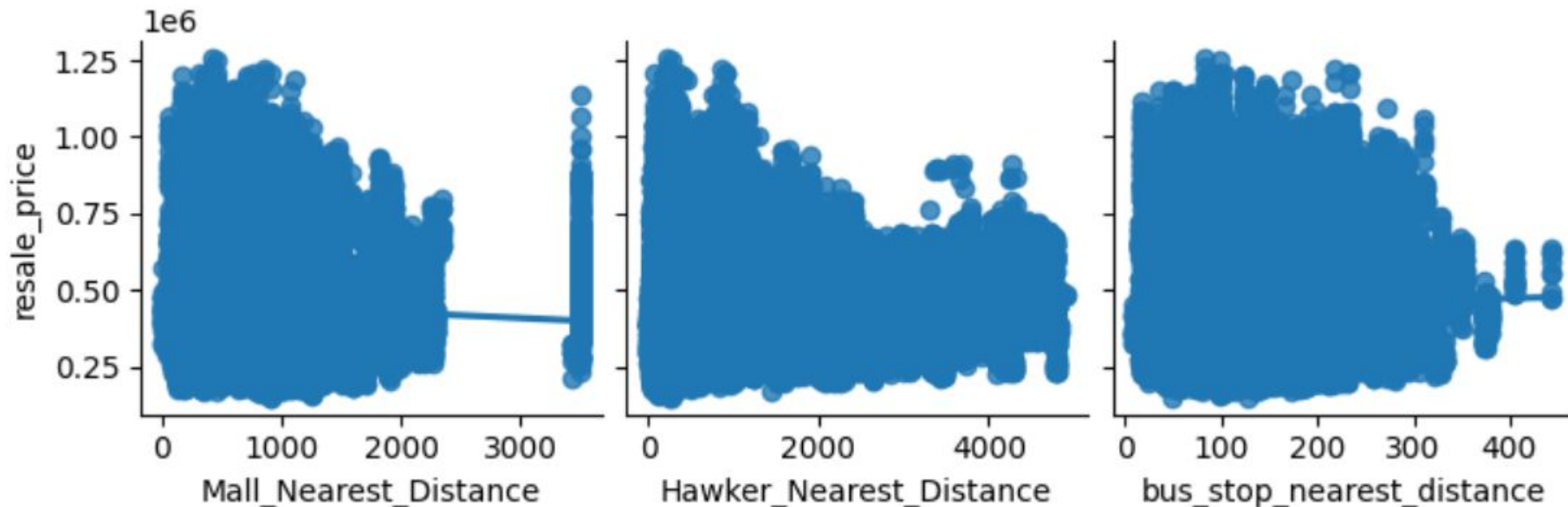
Lastly, there is an out-of-cycle dip in May 2020, likely due to COVID-19

Comparing volume of sales against avg resale prices over time

HDB Average Resale Price Over Time by Flat Type

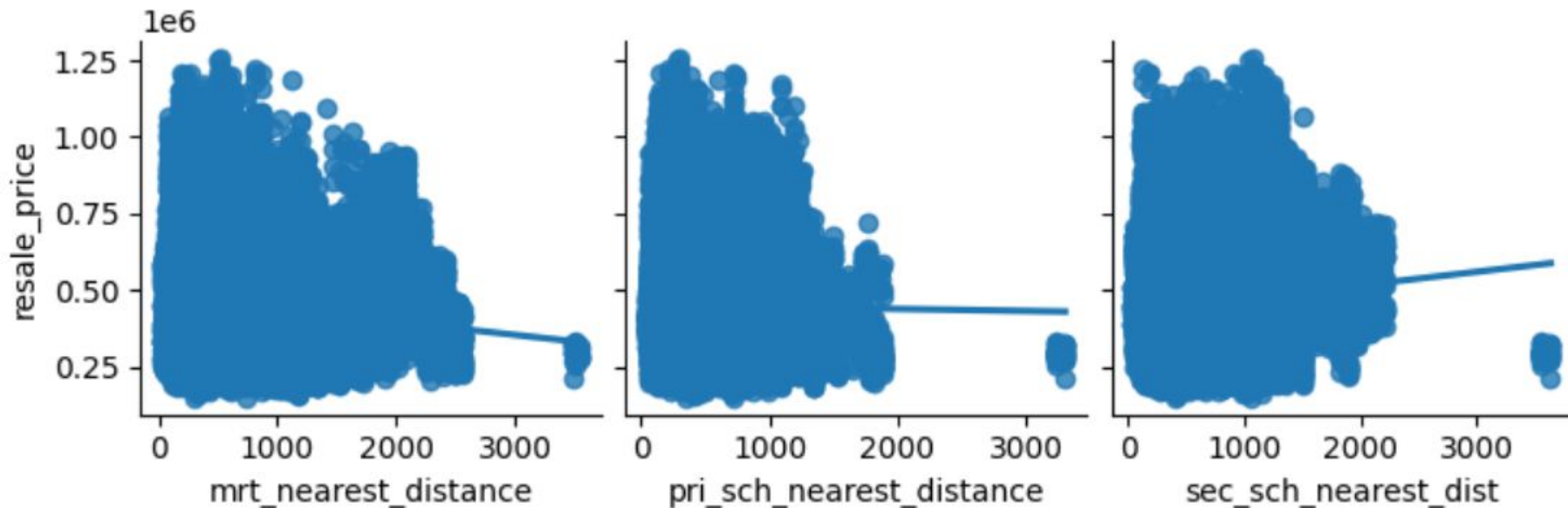


Resale prices based on proximity of amenities



Generally, the further the amenities, the lower the price of the resale flat.

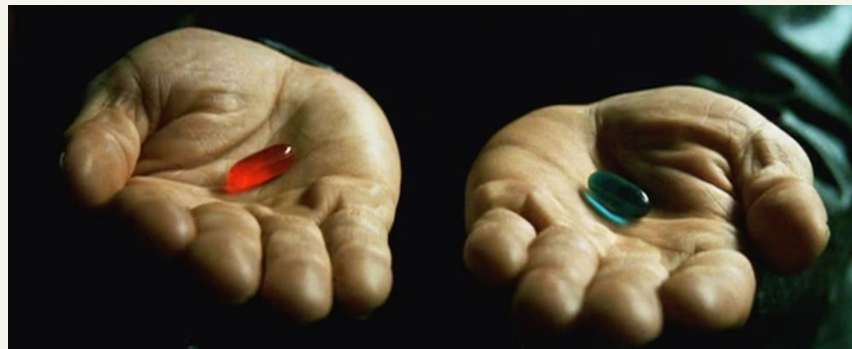
Resale prices based on proximity of amenities



This is consistent across all amenities. Hence, we hypothesise that sale prices are likely to be higher the more amenities are near them.

Key Takeaways

1. Approx. linear relationship between features and HDB resale prices
2. Per correlation matrix, features are mostly independent
3. Continuous nature of features allows their application in regression model
4. Features selected for the model:
 - a. **Continuous**
 - i. floor_area_sqm,
 - ii. age_of_resale_at_transaction,
 - iii. Hawker_Nearest_Distance,
 - iv. Max_floor_lvl,
 - v. Mrt_nearest_distance,
 - vi. Bus_stop_nearest_distance,
 - vii. pri_sch_nearest_distance,
 - viii. Sec_sch_nearest_dist,
 - ix. Mall_Nearest_Distance,
 - b. **Categorical**
 - i. Hdb_age*
 - ii. **Flat_type**
 - iii. **Town**



Findings from our model

Features	Co-efficient
floor_area_sqm	3577.06
age_of_resale_at_transaction	-4232.81
max_floor_lvl	4739.82
Hawker_Nearest_Distance	-22.66
mrt_nearest_distance	-59.70
bus_stop_nearest_distance	0.18
pri_sch_nearest_distance	12.38
sec_sch_nearest_dist	12.07
Mall_Nearest_Distance	-4.41

Findings from our model

Features	Co-efficient
2 ROOM	-14772.25
3 ROOM	13663.78
4 ROOM	20479.61
5 ROOM	32461.32
EXECUTIVE	74607.89
MULTI-GENERATION	148351.18

Findings from our model

Features	Co-efficient
BUKIT TIMAH	154252.52
MARINE PARADE	193790.40
BISHAN	91879.24
BUKIT PANJANG	-118776.90
WOODLANDS	-154152.15
SEMPAWANG	-156252.14

Root Mean Squared Error (RMSE) as the metric for model selection

1. Selected as the metric for model selection
2. We recognise that Singaporeans are practical when it comes to money - we therefore focused on **reducing the magnitude of prediction errors as it directly affects their budget for home ownership**, which R^2 value does not directly provide
3. In a worst case scenario, a large error in our prediction would result in our clients under-budgeting for a resale flat. Hence, RMSE
4. Specifically for this model, we compared our model's RMSE (55159.21) against the Null RMSE (143293.76)

What's next?

Present Day

Minimum Viable Product (MVP)

Prediction of unknown resale flat prices based on current model

Next 4 weeks

Next Immediate Course of Action

Obtain transaction data for 2022 - present day, where available

Conduct EDA on obtained data, and merge with existing 2012 - 2021 dataset

Next 8 weeks

Analysis of data by year

By way of the key factors identified in MVP, conduct further in-depth analysis of flat type / location factors by year

The degree to which individual features actually influence resale price

Next 12 weeks

Explore data by map distribution

Conduct analysis of resale flats' exact coordinates to determine relationship with resale price

Closing Remarks

- As a HDB-first agency, buyers would first need to understand the price range(s) of their target flat type - this is then further complemented with flat location data
- In totality, the various types of amenities (e.g. MRT, Bus, Hawker Centres, Malls, etc) can also influence resale flat price - the degree to which they affect is based on:
 - Number of amenities
 - Amenity distance to flat



Retrospectives

What went well?

- Clear delegation of work to ensure concurrent activities
- Time was well managed and collaborative working
- Each of us were well acquainted with each other's work such that we could cover for each other.

What could have been done better?

- Differing opinions: Internal conflicts when ranking user stories according to viability
- More time: The quality of the model is dependent on the amount of time provisioned.

What continues to puzzle us?

- Why so little time?
- Is our model capable of predicting prices with minimal error?



Any Questions?