How Much Should You Be Paying For That HDB Flat?

Using linear regression to identify HDB attributes that influence resale price

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The Problem

- Using historical resale HDB transaction data, can we more accurately predict HDB Resale Price for a potential buyer to determine the estimated market value of the HDB flat they are interested in?
- Can this help a buyer to understand what factor play a larger part in influencing HDB Resale Price
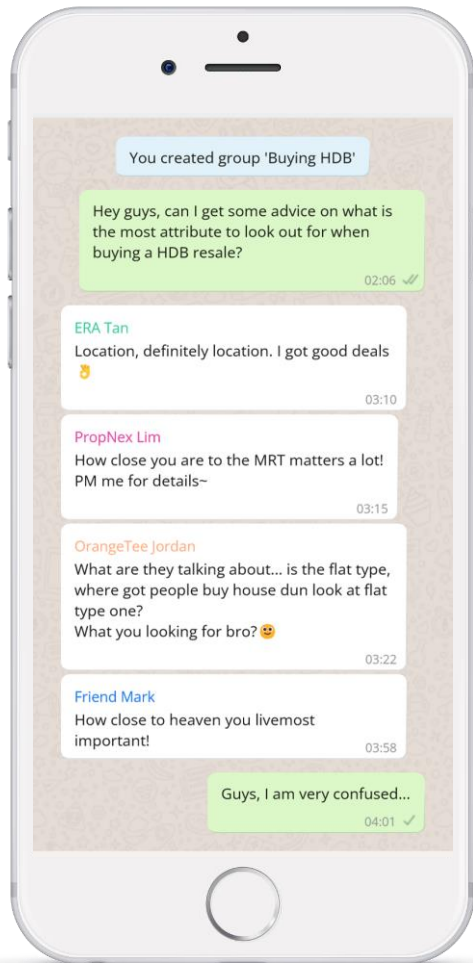
Different property agents, friends, websites all talk about various HDB attributes being important

Who should you believe?

How much does each actually matter?

Today, we will let the data speak for itself

3

Taking a data-driven approach, these are the most important factors affecting the price you can expect to pay
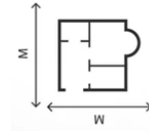
Flat Type
Up to **$148k**
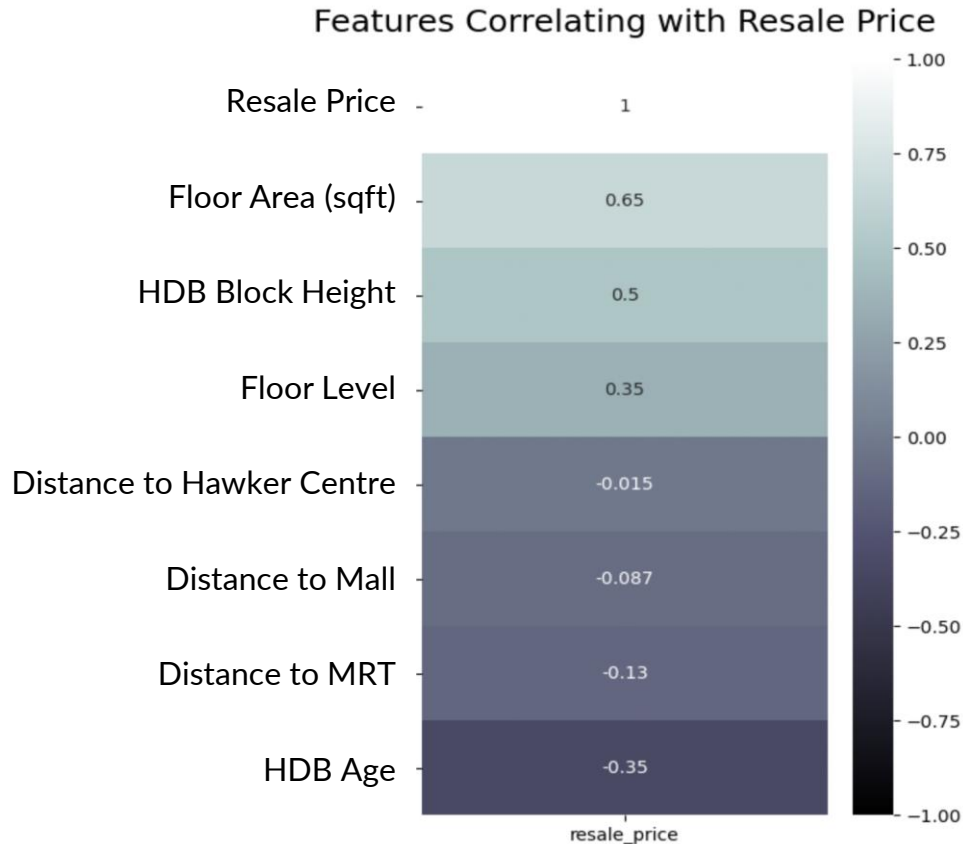
Flat Location
Up to **$190k**

Floor Area
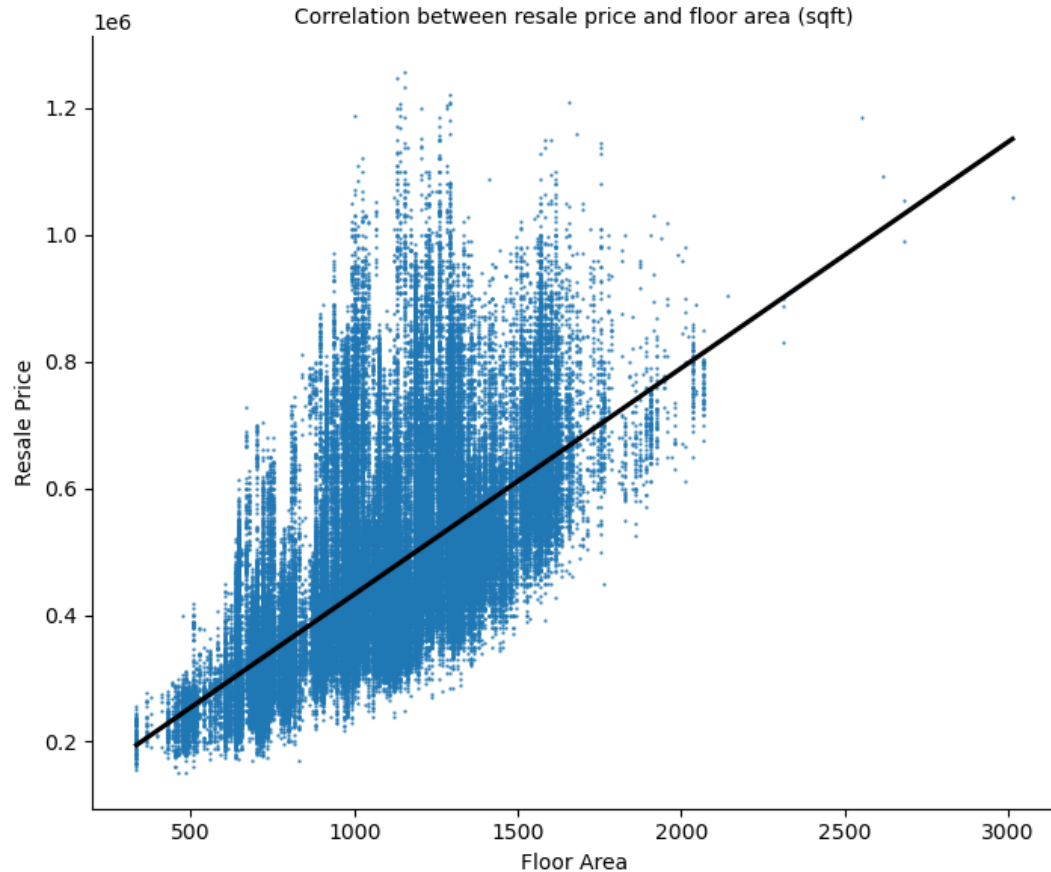ea 100sqft **$32k**

Floor Level
Up to **$75k**

Note: Based on historical HDB resale data from Mar 2012 to Apr 2021

From historical HDB resale price data, these variables have the highest correlation with price

Features Correlating with Resale Price

Floor area definitely plays a role in determining resale price

Correlation between resale price and floor area (sqft)

The older a unit, the cheaper it becomes?

Correlation between resale price and HDB age
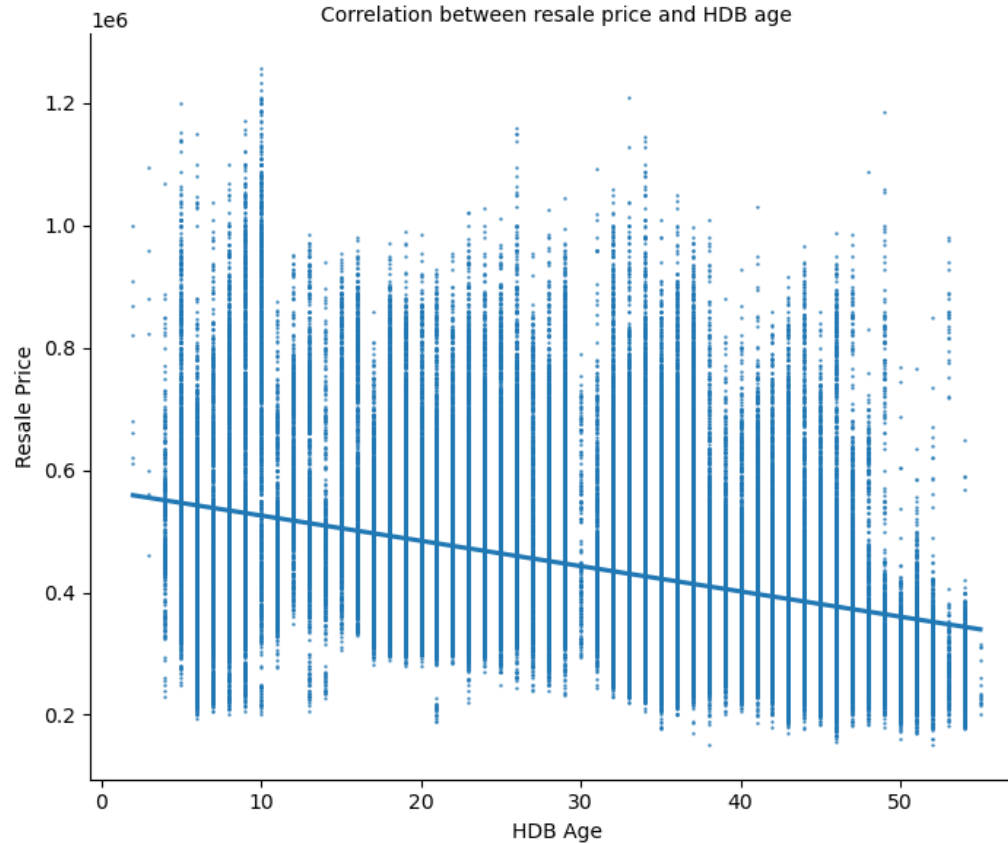
It's not just only about our houses

MRT

Correlation between resale price and nearest distance from MRT

Malls

Correlation between resale price and nearest distance from mall

Hawker Centres

Correlation between resale price and nearest distance from hawker
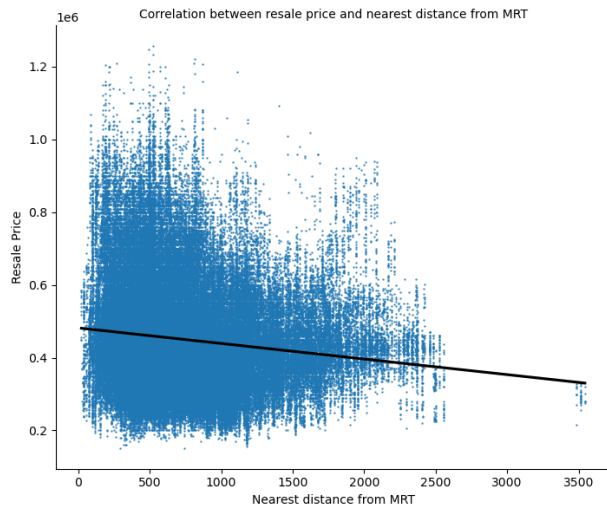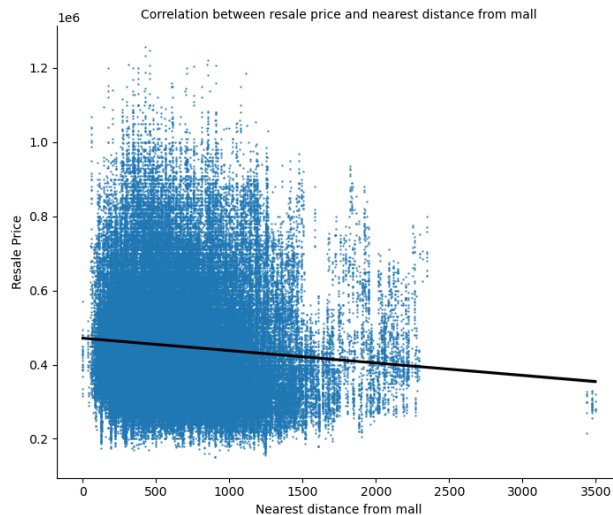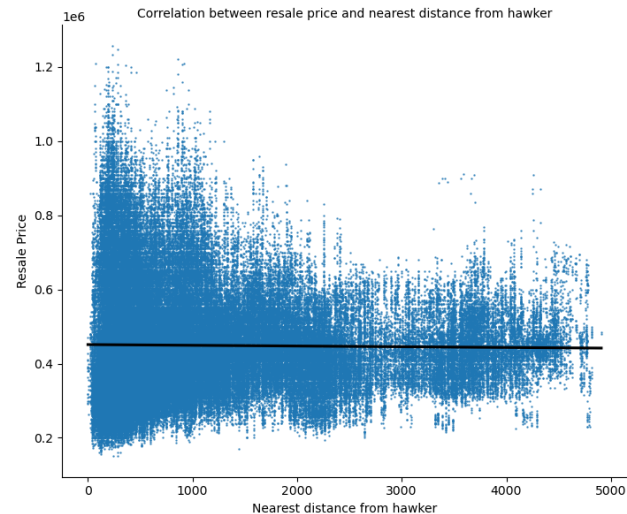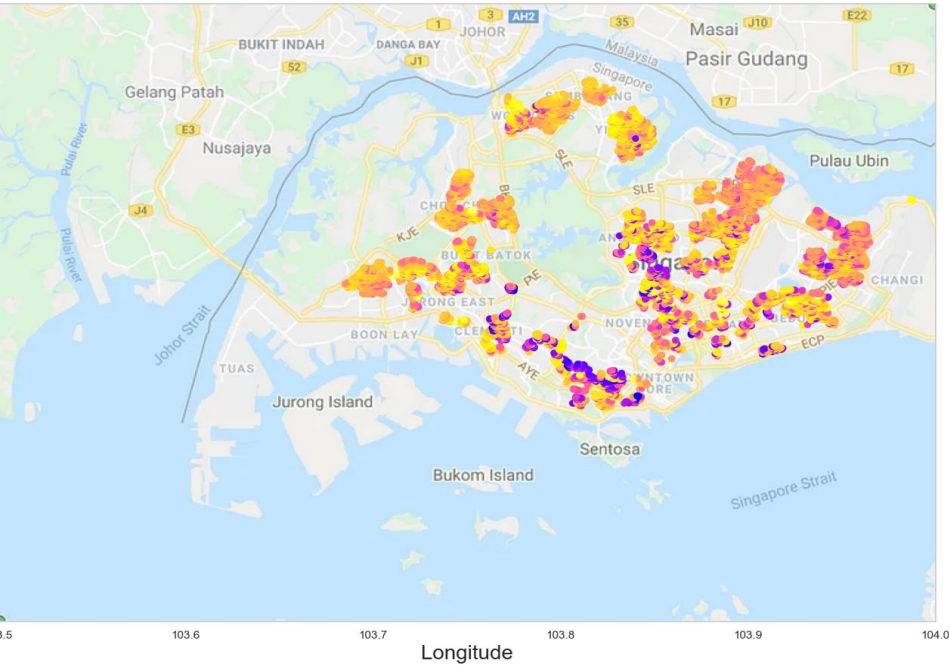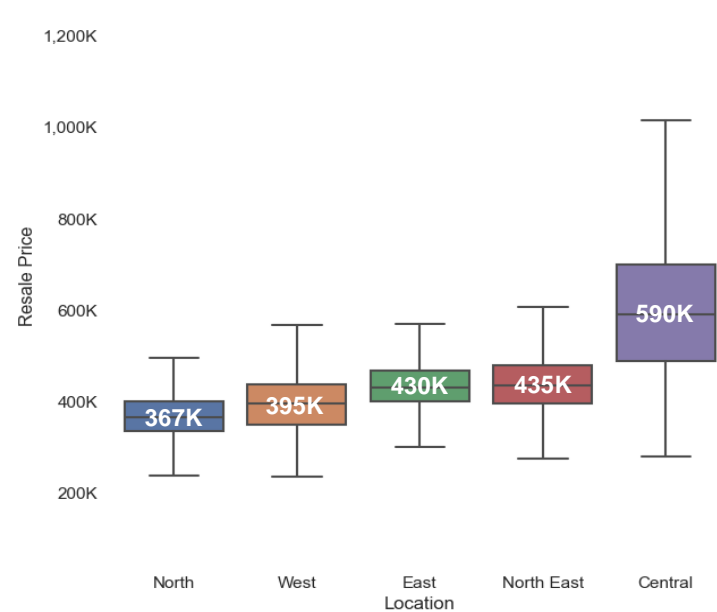
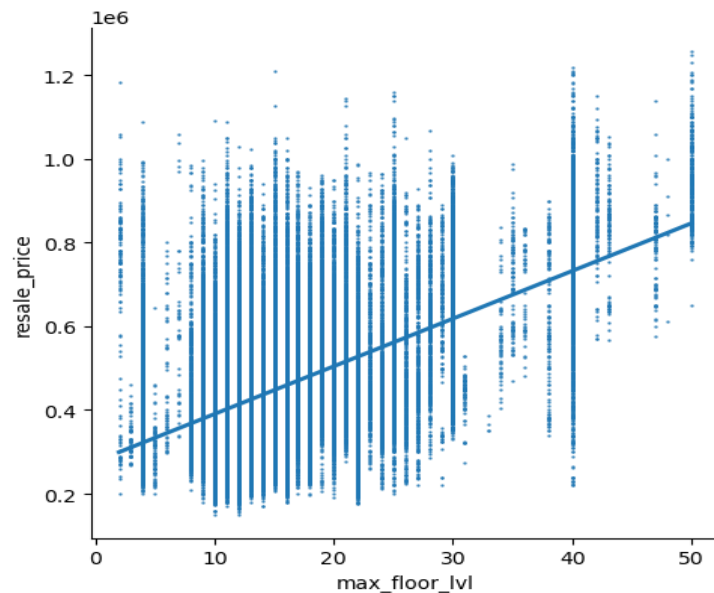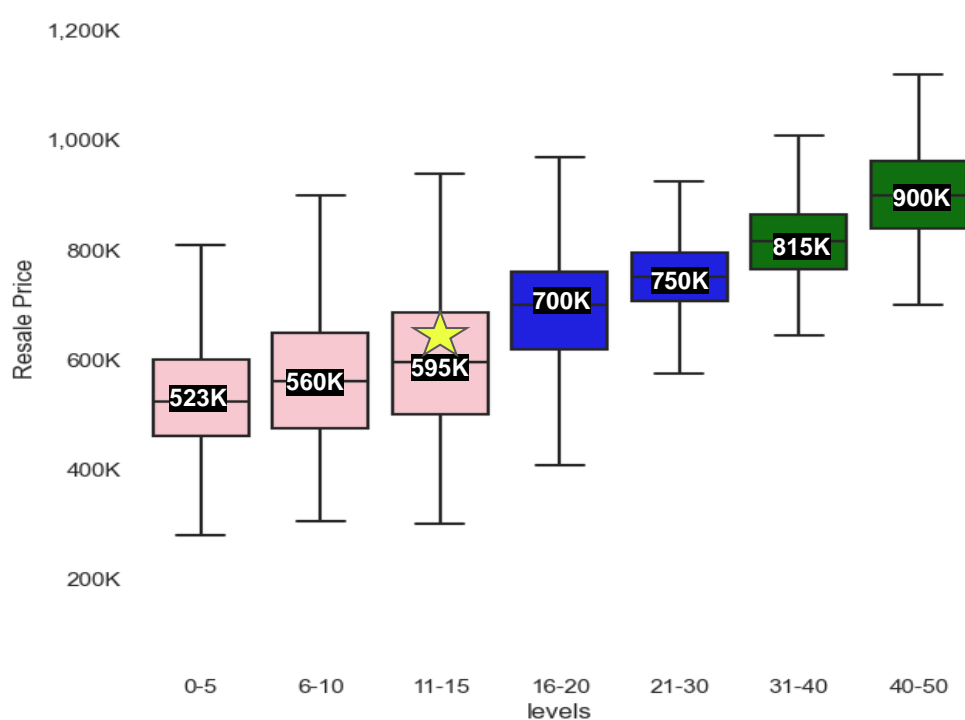# Location has an impact on resale price

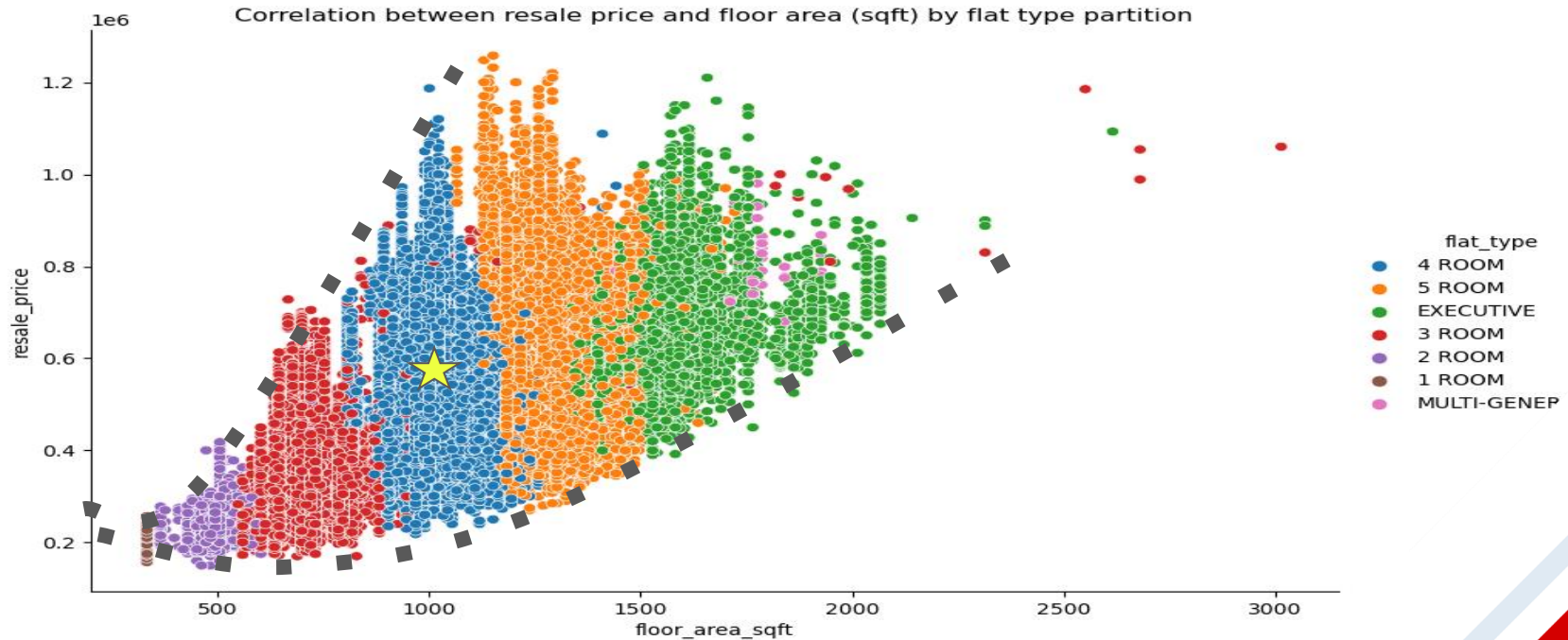Distribution of Resale Price of 4Room HDB by Location

Higher floors command higher prices

Distribution of central region 4Room HDB resale Price by levels

The type of flat also impact on resale price... though not always the case

Correlation between resale price and floor area (sqft) by flat type partition

After exploring the relationship of each attribute with resale price, 2 questions remain...
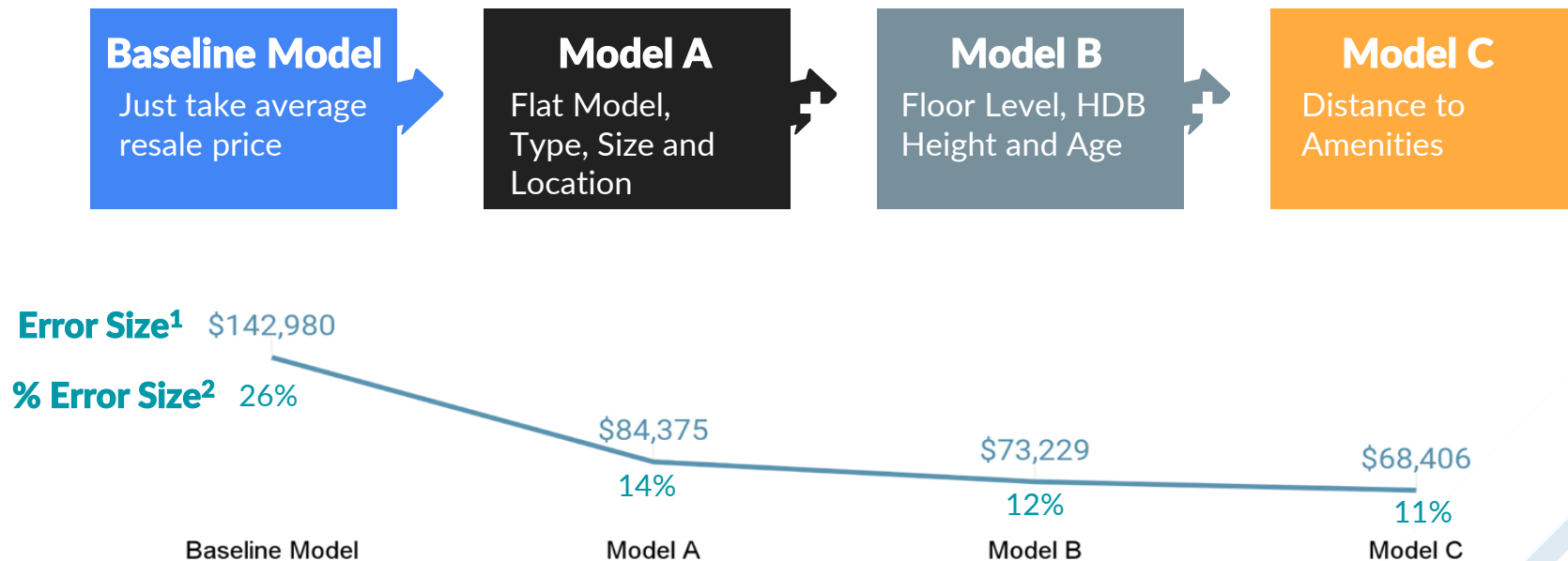
What is the specific impact of each variable on resale price?

If I buy a unit 15 floors higher, how much more do I expect to pay compared to the 10th floor?

How do all the variables come together to affect how much I can expect to pay?

If I want to buy a 5 room HDB in the central region on the 25th floor or higher, how much am I expected to pay?

Our model is iteratively refined to provide the most accurate prediction for the average buyer

Baseline Model	Model A	Model B	Model C
Just take average resale price	Flat Model, Type, Size and Location	Floor Level, HDB Height and Age	Distance to Amenities

Error Size[1] $142,980

% Error Size[2] 26%

$84,375
14%

$73,229
12%

$68,406
11%

Baseline Model   Model A   Model B   Model C

Note 1: Error size refers to the RMSE, a.k.a. average uncertainty in the resale price prediction (e.g., the error size of $20k means the predicted price could be on average $20k higher or lower than the actual price) on the test dataset
Note 2: % error size refers to the RMAPE, a.k.a. average percentage uncertainty in the resale price prediction on the test dataset

The HDB flat's inherent attributes and location have significant impact on resale price
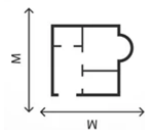
Flat Size

Every 100sqft	$32k

Flat Location (v outside central area)

Central	$84k

Flat Model (v 2R Flexi)

Terrace	$414k
Mansionette	$49k~$143k
Type S1/S2	$32k~$121k
DBSS	$108k
Multi-Gen	$73k
Apartment	-$43k~$68k
Simplified	-$21k
New Gen	-$31k
Improved	-$36k
Model A/A2	-$84k~-$53k

Flat Type (v 1 Room)

Multi-Gen	$73k
Executive	$35k
5 Room	$35k
4 Room	$40k
3 Room	$28k
2 Room	$2k

Flat's floor level and HDB block's characteristics also have an impact on resale price but amenities have limited impact

Floor Level
Every increase in floor $3.4k

HDB Age
Every yrs older   -$3.7k

MRT Distance
Every 100m further   -$6k

Hawker Centre Distance
Every 100m further   -$2.1k

Mall Distance
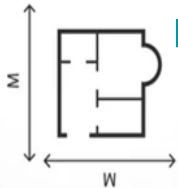Every 100m further $1.3k

Top Feature that affect the hdb price

Flat Location
Up to or down to **$190k** to - **153k**

Flat Type
Up to **$148k**

Floor Area
ea 100sqft **$33k**

Floor Level
Every increase in floor $3.4k
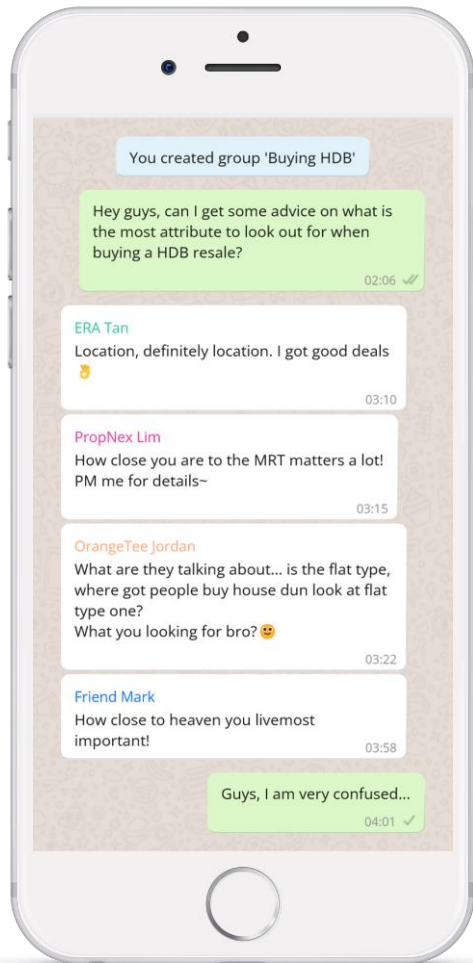
MRT Distance
Every 100m further -$6k

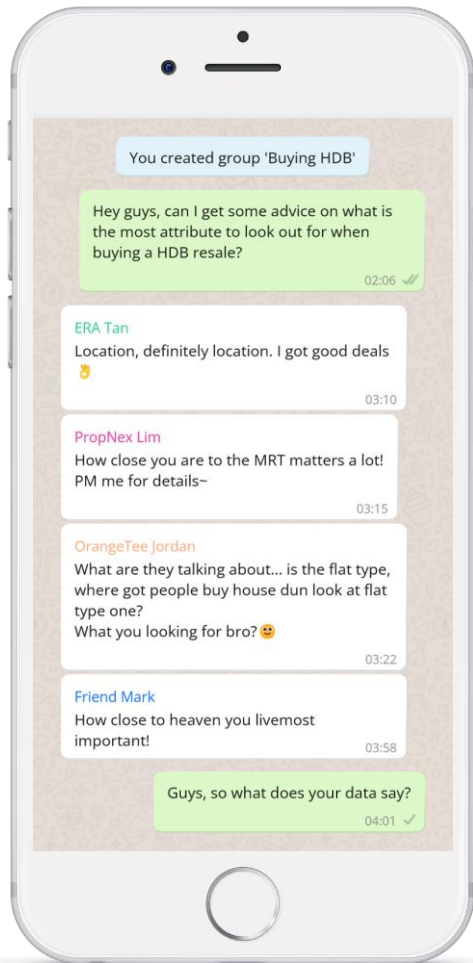**HDB Age**
Every yrs older -$3.7k

We are just scratching the surface...

Our analysis is suitable for the average buyer

But probably more useful than what you heard over WhatsApp

... are you an average buyer?

HDB attributes are valued differently by buyers based on their needs. We can further tailor the model based on buyer archetypes

THANK YOU

Q&A