



Public Housing Resale Market in Singapore Analysis

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Background & Objectives

Background

There are various different flat types and flat models managed by HDB (Housing & Development Board) that provide flexibility to cater the living requirements of the residents. Resale flat price are influenced by many factors.

Objectives

Analyzing Overall Picture

Analyzing overall picture of the flat resale prices from the data

Determining Key Factors

Determine key factors that affected the flat resale price



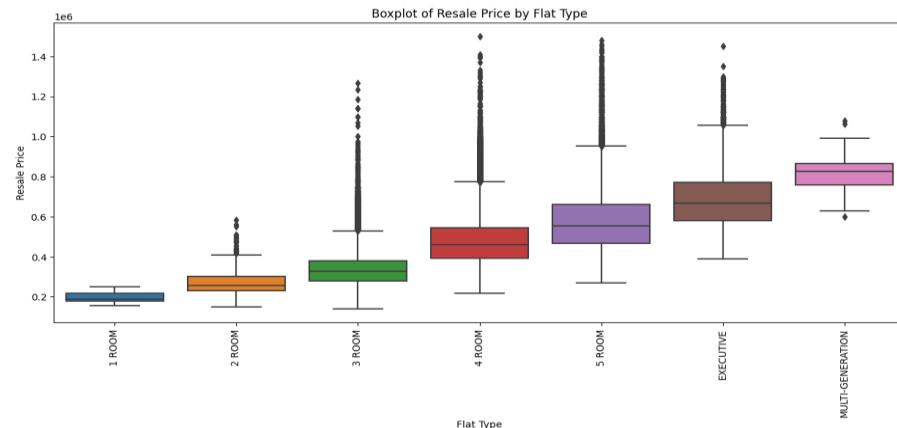
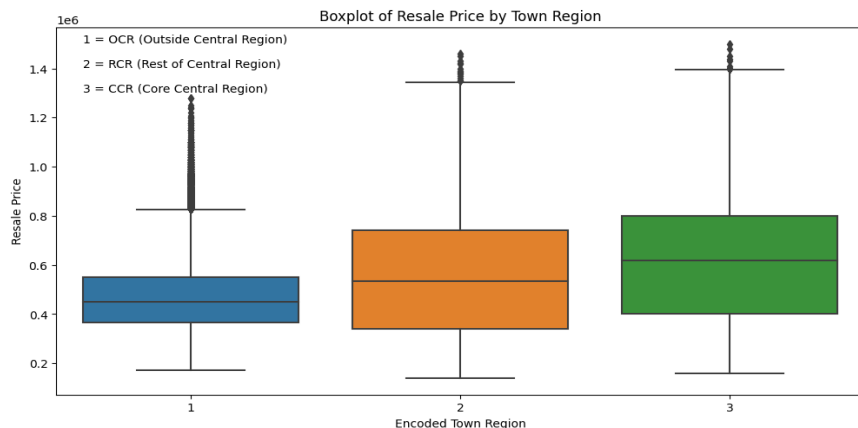
Developing Segmentation Model

Developing segmentation model to categorize each flat affordability

Creating Prediction Model

Creating regression model to predict the resale price

Analyzing Overall Picture



Flat Location Analysis

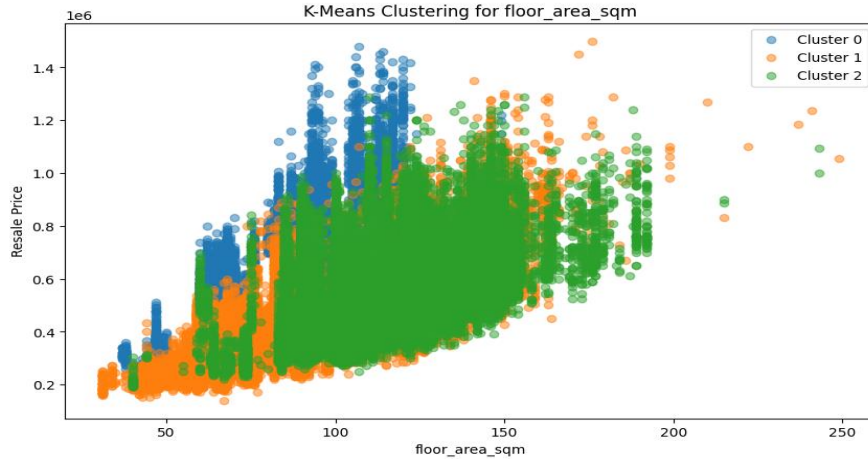
- Resale prices vary between different towns
- Among the market segments (CCR, RCR, and OCR), CCR towns have the highest median resale prices
- Mature towns* tend to have higher average resale prices compared to non-mature towns

*Mature towns: Towns that are over 20 years old and located in areas with more residential amenities.

Flat Description Analysis

- Flat resale price also varies depending on their descriptions
- Price shows a positive correlation with flat floor area SQM, number of rooms, storey median, and remaining lease in months, while vary price variation for flat model

Developing Segmentation Model – Kmeans Clustering



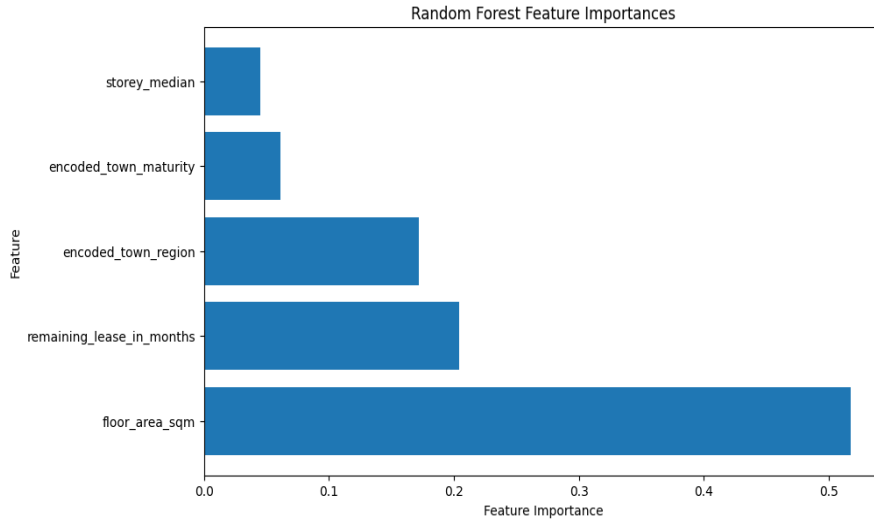
Resale Price Aggregation based on Cluster

	max	mean	median	min
cluster				
0	1480000.0	555845.195727	525000.0	195000.0
1	1500000.0	419790.066888	380000.0	140000.0
2	1288888.0	517317.835813	489525.0	190000.0

Segmentation Model

- Resale price distribution shows vary centroid among each cluster
- Therefore, it can be inferred that:
 - Cluster 1 as the "Very affordable" category
 - Cluster 2 as the "Affordable" category
 - Cluster 0 as the "Not Affordable" category
- Factors associated are from the correlation between the key factors toward the resale price

Determining Key Factors



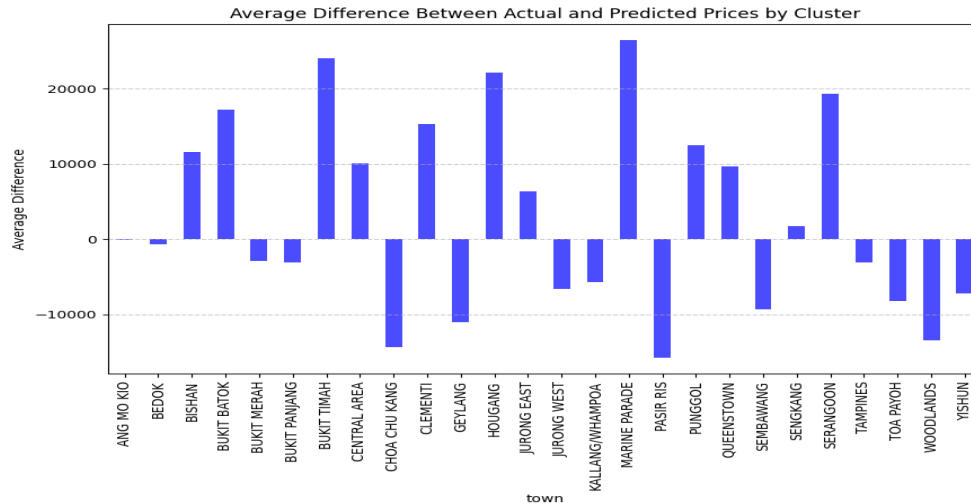
	Feature	Importance
0	floor_area_sqm	0.517714
1	remaining_lease_in_months	0.204338
3	encoded_town_region	0.171647
4	encoded_town_maturity	0.061282
2	storey_median	0.045019

Key Factors

- The value shows how the correlation between factors
- Resale price has a correlation with factors:
 - Floor area sqm (**High correlation**)
 - Remaining lease in months and town region (**Moderate correlation**)

Creating Prediction Model – Random Forest

Model	Metrics			
	MAE	MSE	RMSE	R^2
Linear Regression	73,158	8,437,908,729	91,858	0.71
Decision Tree Regression	58,664	6,782,553,602	82,356	0.76
Random Forest Regression	51,317	4,879,043,048	69,850	0.83



Prediction Model

Random Forest is chosen as the prediction model because it had the highest R^2 value and the lowest error metrics.

Conclusion & Recommendation

- Top 3 factors that affect the flat resale price are floor area, remaining lease, and town region.
- Top 3 average under value flat that recommend to buy is located in PASIR RIS, CHOA CHU KANG, AND WOODLANDS
- IF the case the property agent looking for specific flat type (based on room), it is recommended to purchase the flat on:
 - 1 Room (BUKIT MERAH)
 - 2 Room (CHOA CHU KANG)
 - 3 Room (PASIR RIS)
 - 4 Room (PASIR RIS)
 - 5 Room (CHOA CHU KANG)
 - Executive (BUKIT MERAH)
 - Multi Generation (YISHUN)