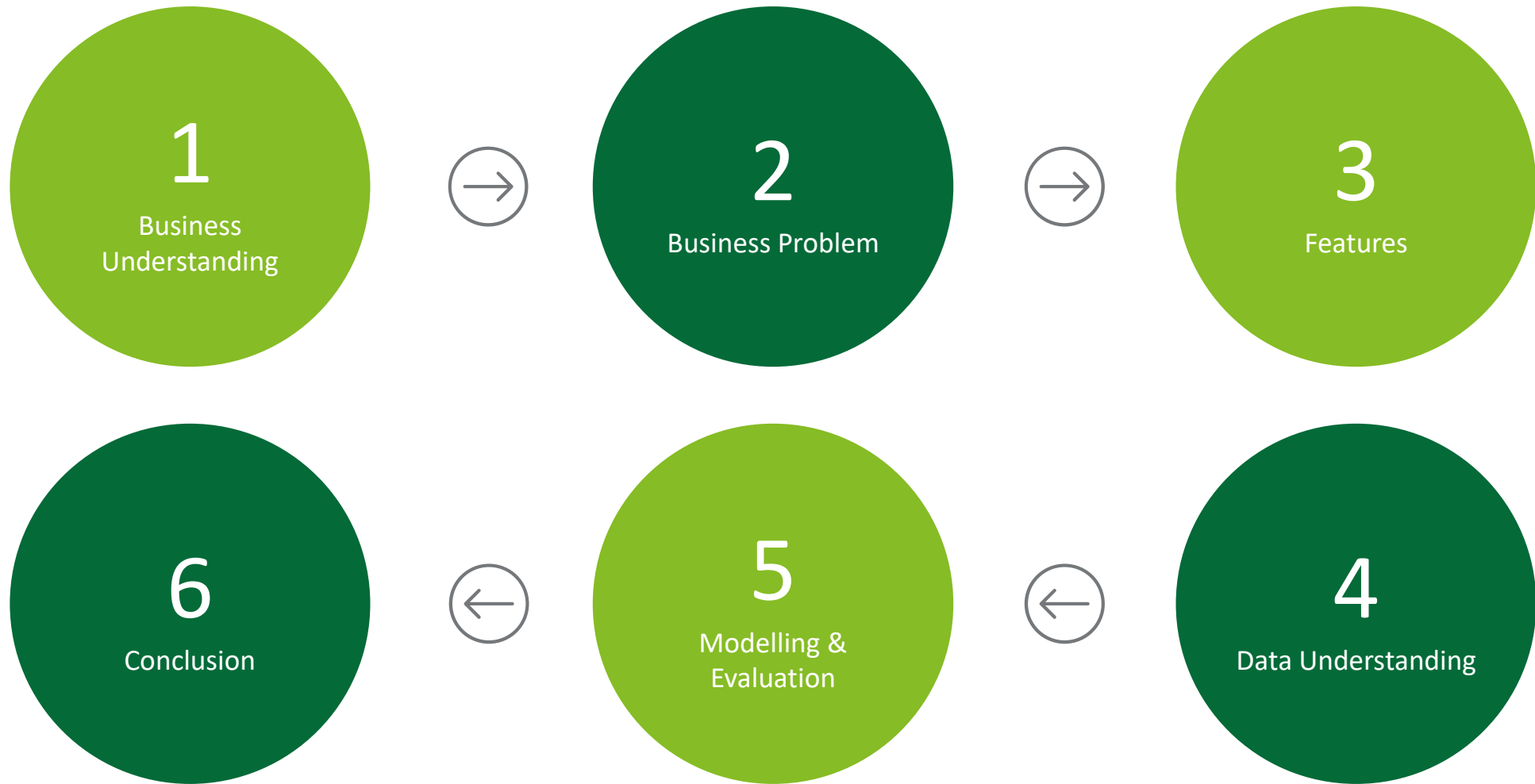




Home in the Outback: Predicting Housing Prices in Australia

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Business Understanding



Australia's housing crisis, largely hidden, is getting worse

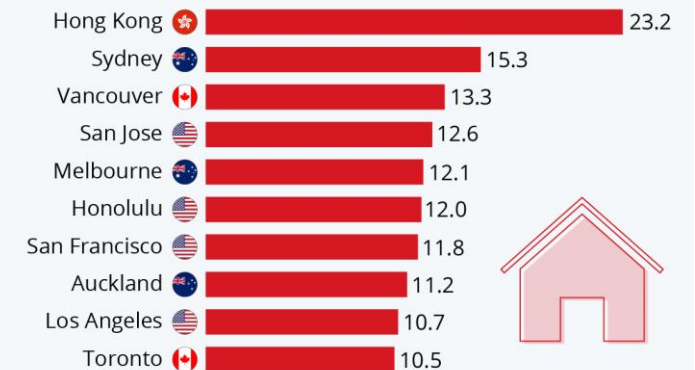
Underquoting in Australian real estate industry is leaving buyers feeling betrayed

“It’s misleading, it’s a fraud on purchasers. And until significant penalties are handed out, regulations have been ineffective ... if one does it, others have to follow.”

- David Morrel, buyer’s advocate

Where It Is Hardest to Afford a Home

Least affordable international housing markets ranked by house price to annual income ratio (2022)*



* median house/apartment price divided by median annual gross income
Source: Demographia International Housing Affordability Survey



statista

Business Problem

Problem

Potential buyers are having difficulties buying or renting Australian properties.

- Historical trend of rising prices
- Rampant underquoting

Objective

Develop a model for these potential homeowners that:

- Determines the true price of a property
- Aids in locating homes that fit the buyer's requirements
- Figures out which homes are sold at a discount

Features

1 Building Size

3 Bedrooms

5 Parking Spaces

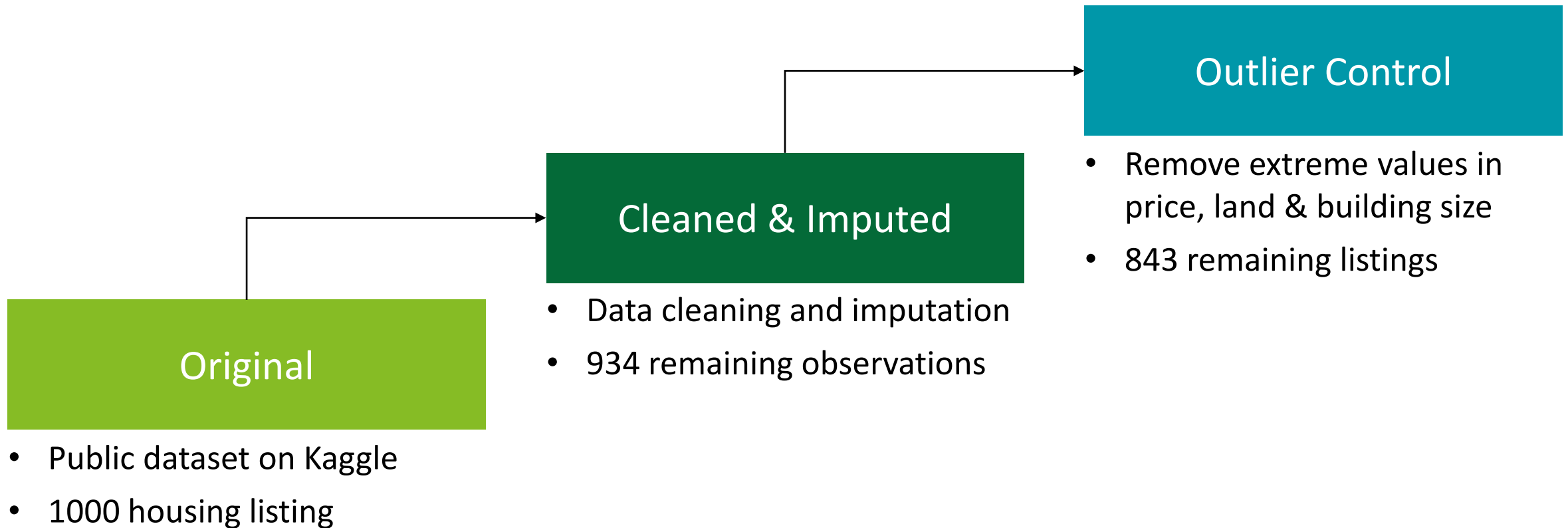
2 Land Size

4 Bathrooms

6 Property Type

7 Product Depth

Data Understanding



Data Understanding

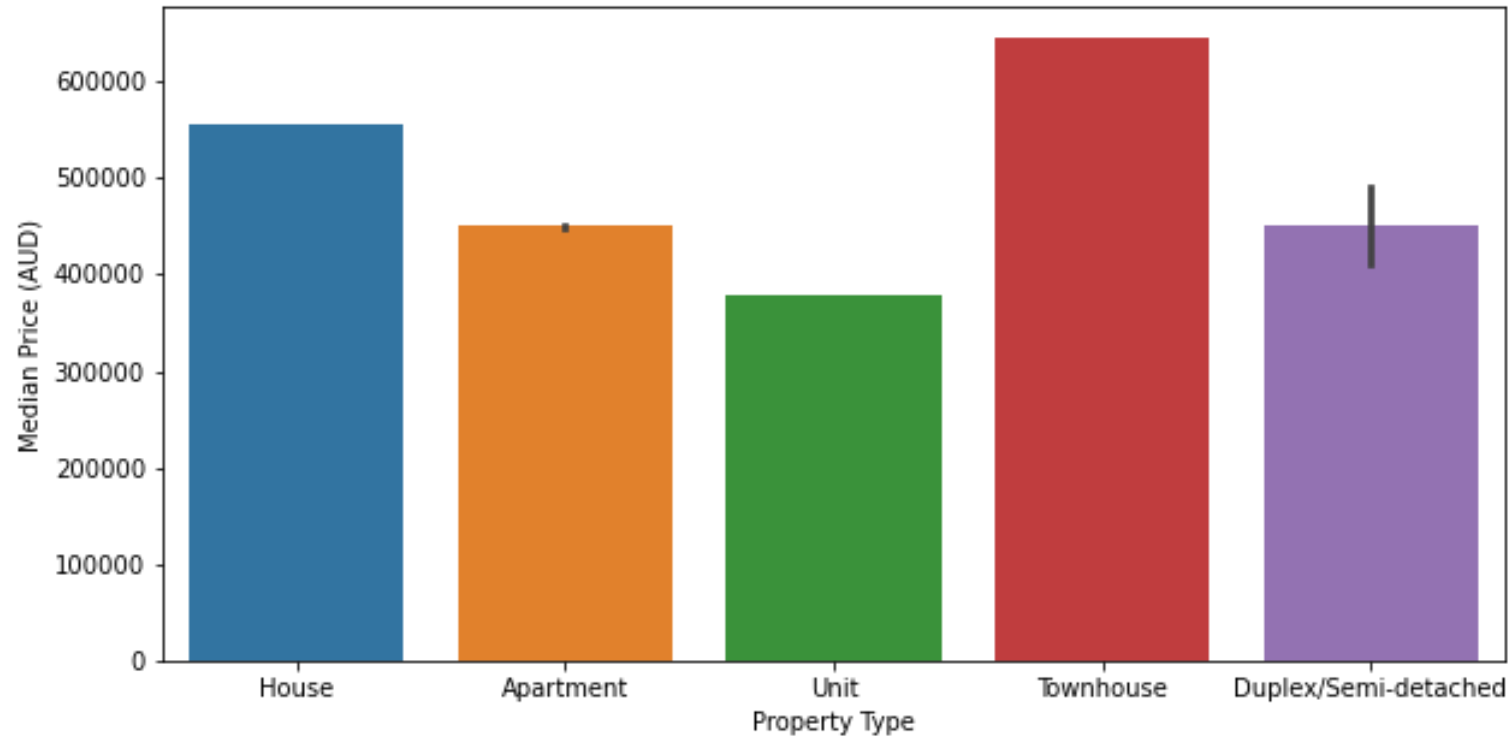


Figure 1: Median housing prices by property type.

Data Understanding

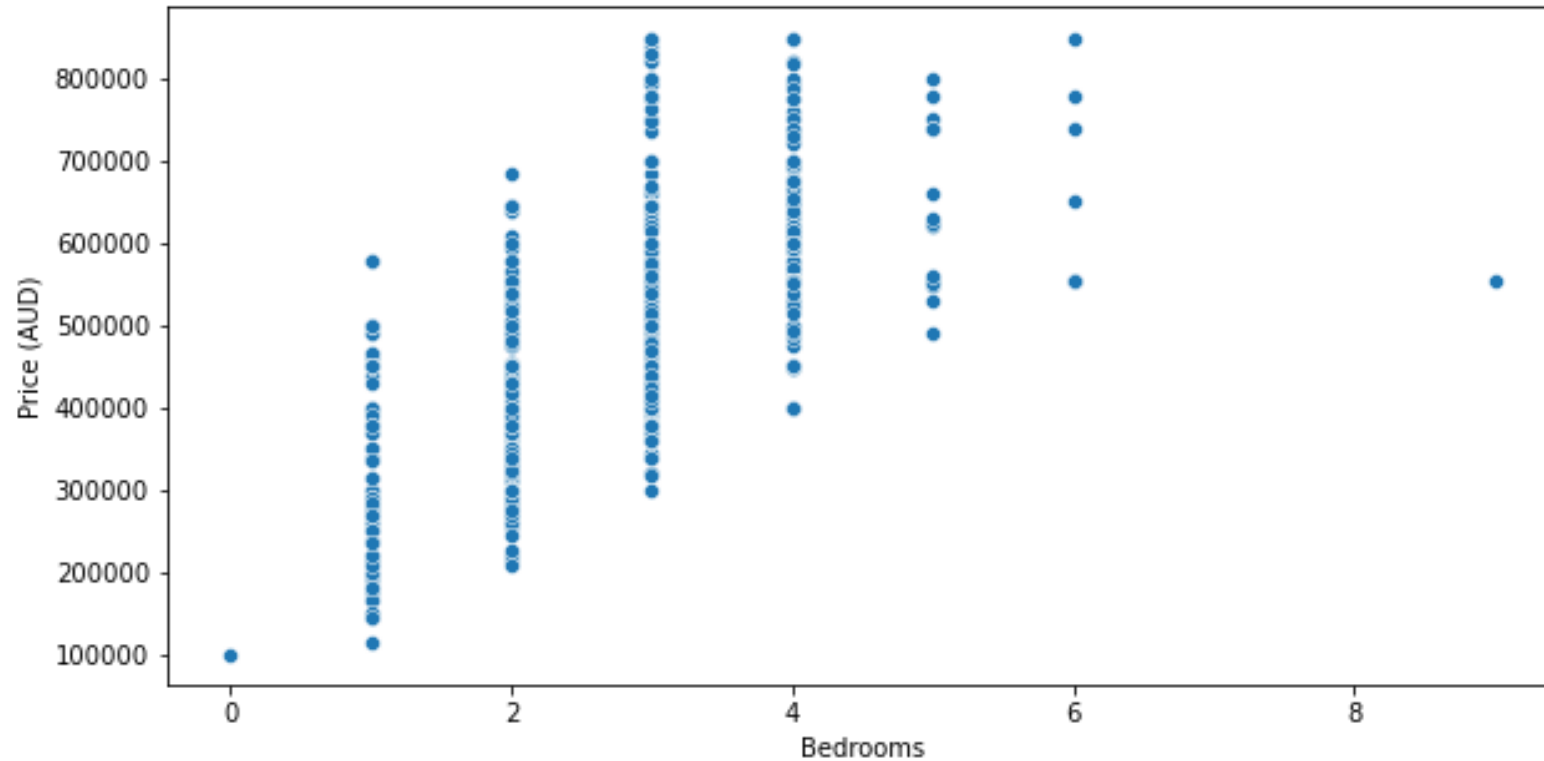


Figure 2: Housing prices over number of bedrooms.

Data Understanding

	Median	IQR
Building Size (m ²)	147	103
Land Size (m ²)	294.5	650
Bedrooms	3	1
Bathrooms	2	1
Parking Spaces	2	1
Price (AUD)	485,000	177,500


Table 1: Descriptive statistics of features and target.

Modeling & Evaluation

Model	RSME (AUD)
Baseline	124,670.31
Decision Tree	94,997.47
Gradient Boosting	87,969.37
Gradient Boosting (subsampling)	85,967.02

Table 2: Comparison of model test performance.

Conclusion



On average, the best model predicts the true value of Australian housing within 85,967.02 AUD. This is an approximately 31% improvement in performance compared to the baseline.

Limitations

- Listing data is subject to underquoting.
- Small public dataset (1000 listings)
- Inability to implement geographic information.

Future Improvements

- Use sold housing data for true property value.
- Implement neural networks on a larger dataset.
- Investigate the effects listing agencies have on pricing.