

Real Estate

Group 32

Meet the team

Group 32

- Dylan Beaumont
- Matthew Rush
- Nguyen Duc Le
- Jesse Cooper
- Yanbo Feng

Project Overview

- Collected all current and historical data
- Found a reasonable method of predicting rent prices
- Identified 10 suburbs we believe to have the highest growth rate
- Identified the most liveable and most affordable suburbs within Victoria

Scraping Properties

- Collected properties for rent within Victoria
- Had to grab properties by postcode
- Scraping resulted in 15,271 properties being collected

≡ Domain

VIC X Q

Filters Rent Price Beds Property types

14321 Properties for rent in VIC



 Kristen Standish
Sweeney Estate Agents Williamstown SWEENEY

\$630 ★

Unit 3/9 Roches Terrace,
WILLIAMSTOWN VIC 3016

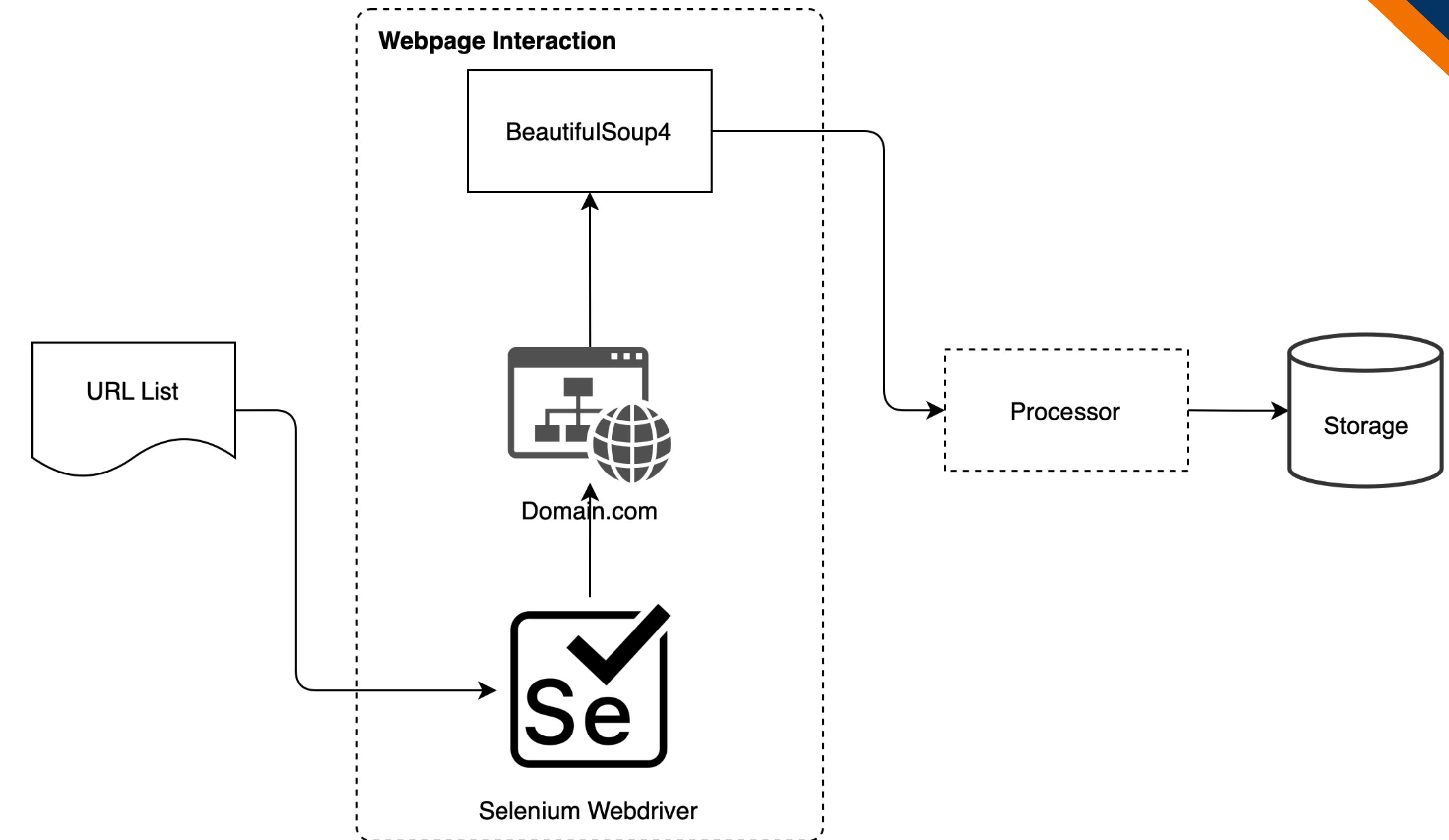
 2  1  1 • Townhouse

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Scraping Historical Data

- To grab the historical data on suburbs we had to scrape interactive webpage data



External datasets

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GitHub



Education
and Training

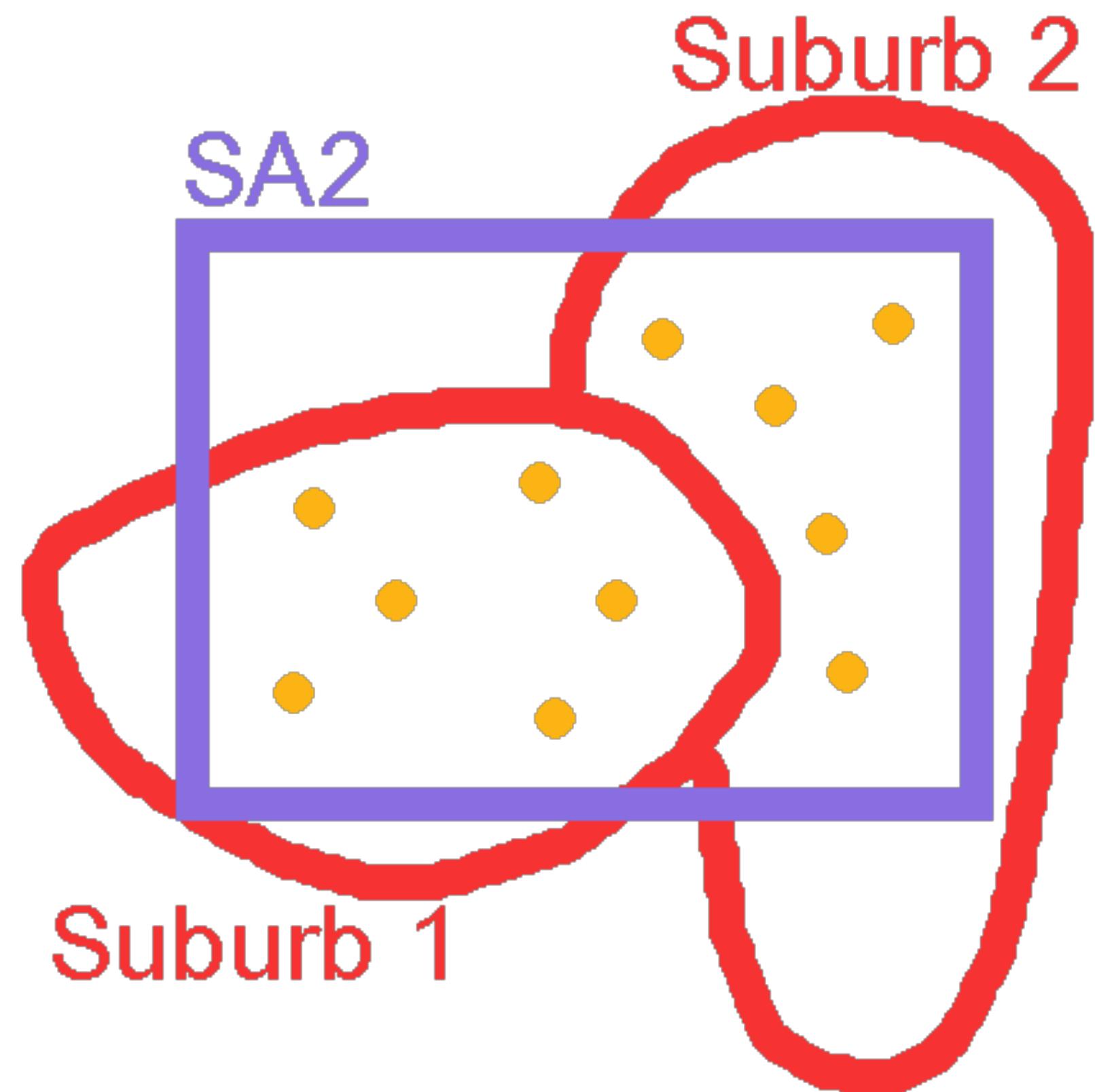
Pre-processing

- Used regular expression (regex) to clean fields scrape

Rent for \$180 per week
\$60
\$370 Per Week
\$375 PW / AVAIL. NOW
\$585
\$440pw
\$450 Per Week
\$2,173pcm/\$500pw
\$775/Week (\$3367/Month)
\$700.00
\$780 p.w.
\$780pw/\$3,390pcm
\$610 Per Week
\$355 p.w.
\$480 weekly
\$515 Per Week
\$350 pw/ \$1521pm
Application Pending
\$355 per week/\$1543 PCM
\$600 per week/\$2607 pcm
\$430.00 weekly
\$370.00 Per Week
\$380PW

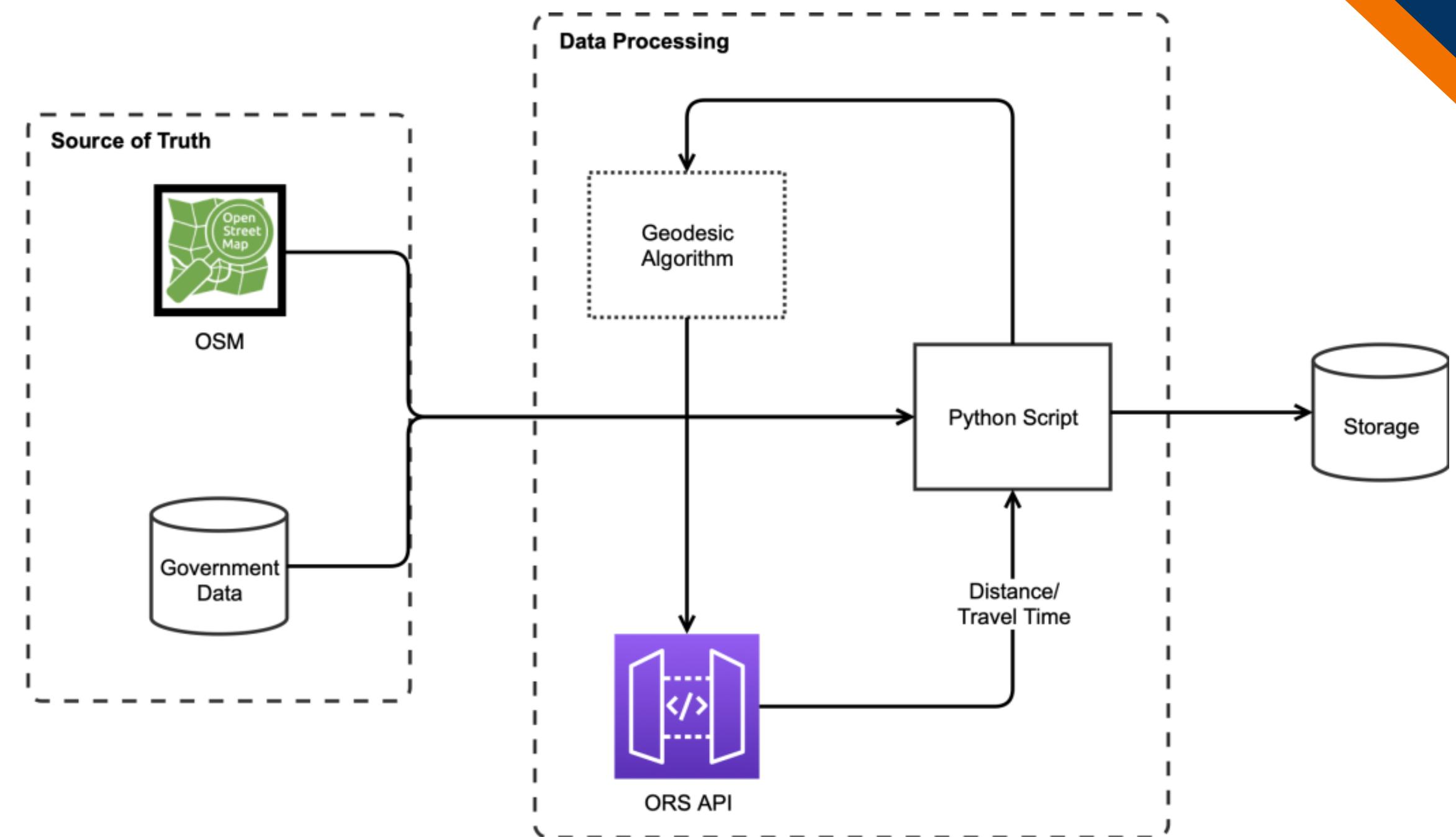
Converting SA2 between suburb

- Some data only provided in SA2 areas
- Properties were grouped by suburb, but had latitude and longitude
- Using each properties latitude and longitude they were placed in the appropriate SA2 zone
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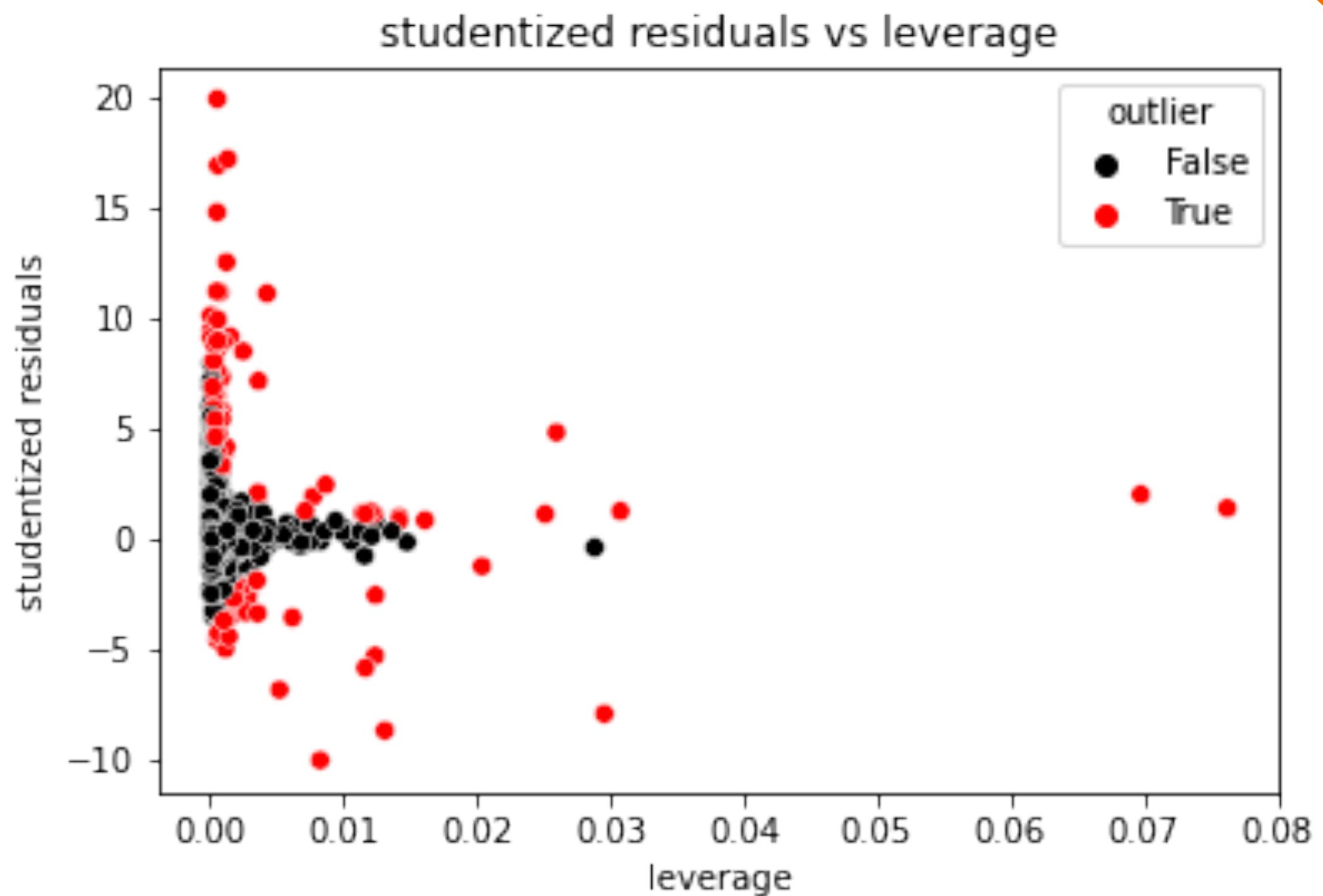
API process

- Used openRoads to find the distance each property was from:
 - ↳ Schools
 - ↳ Parks
 - ↳ Shops
 - ↳ Trains Stations
 - ↳ Bus or Tram Stops
- Used a Geodesic Algorithm



Outlier analysis

- Scrapped data had quite a few point that would throw off analysis
- Used box-plot to remove obvious point
- Used cook's durance to remove points with too much influence
- Lost __ properties during process
- Final number of properties: __



Final datasets

- Collected by suburbs

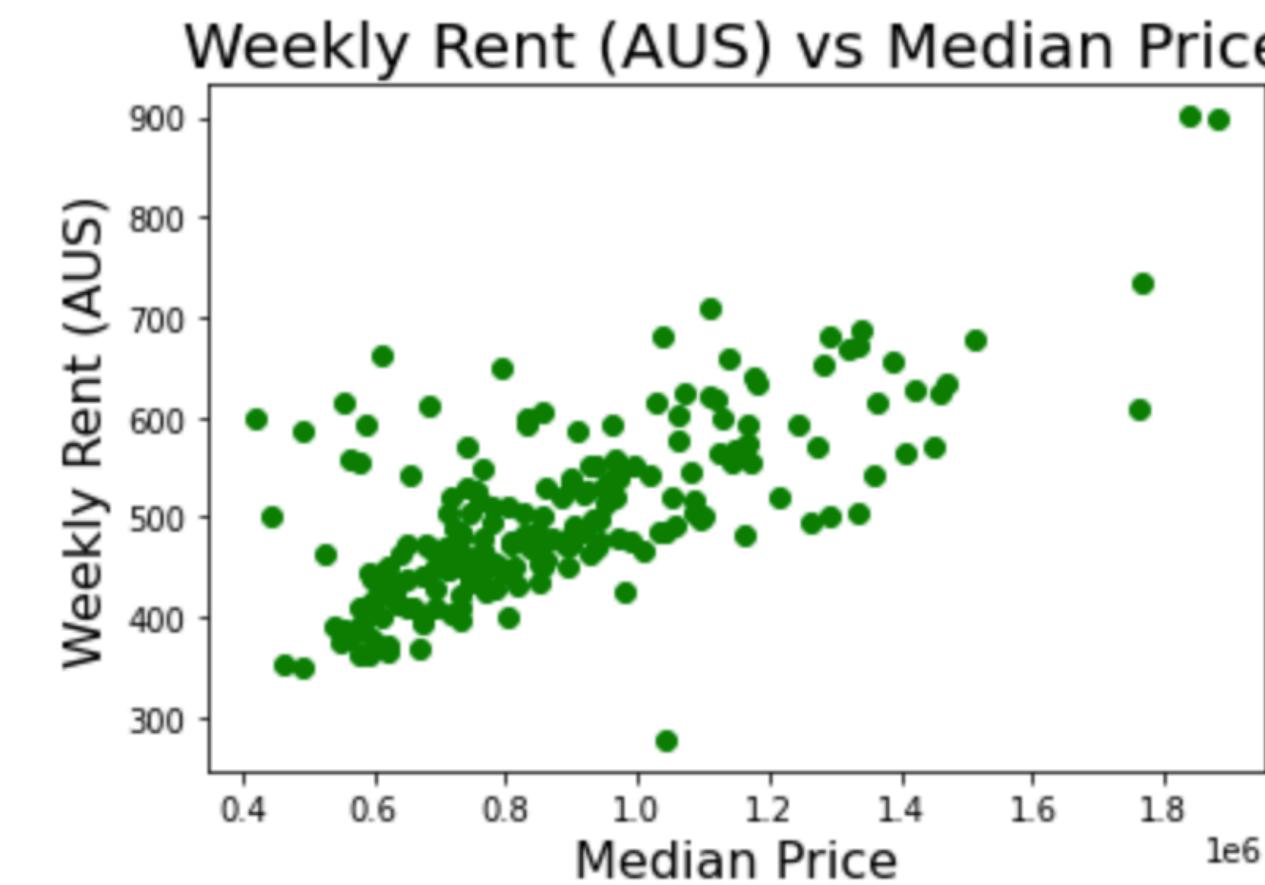
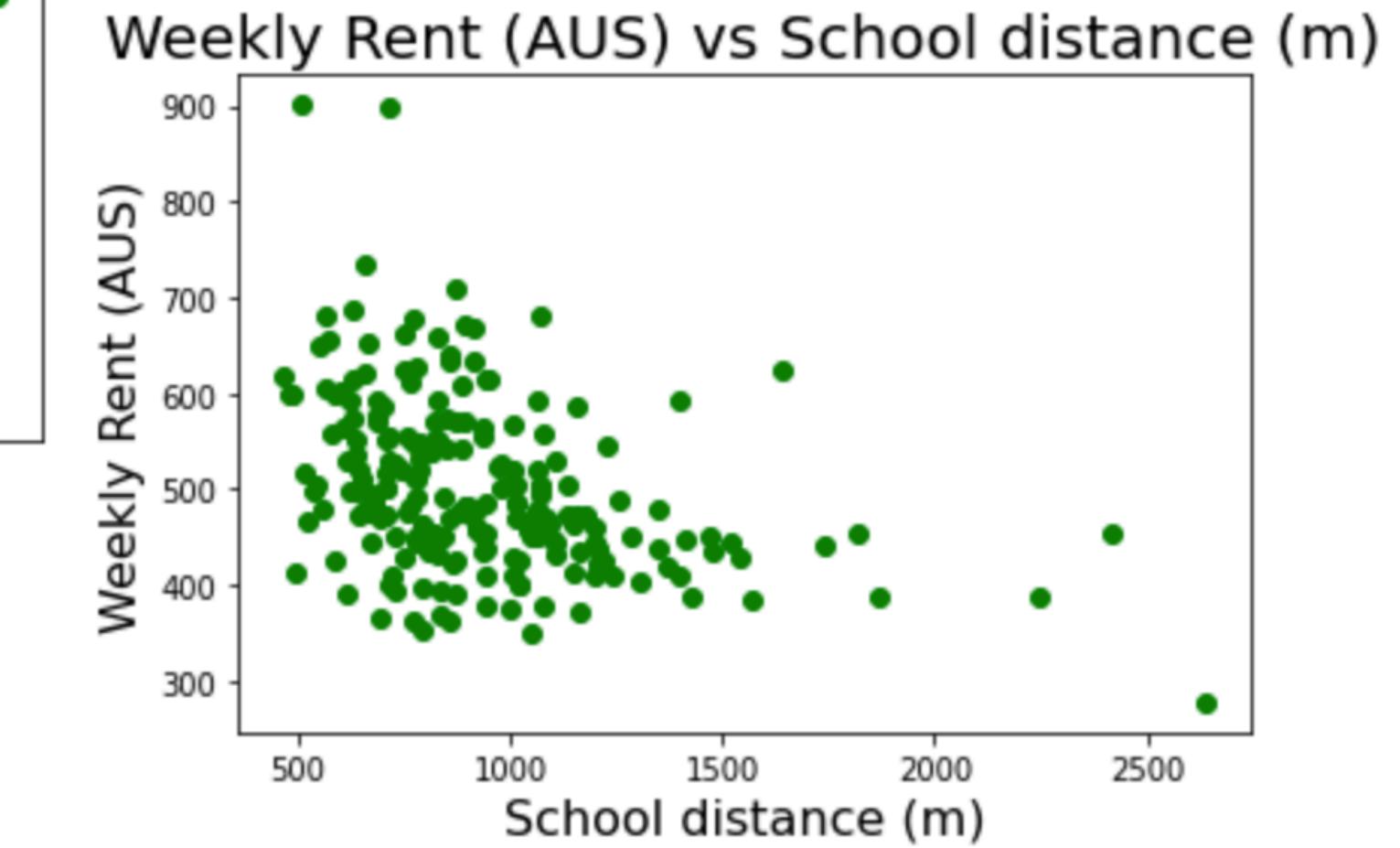
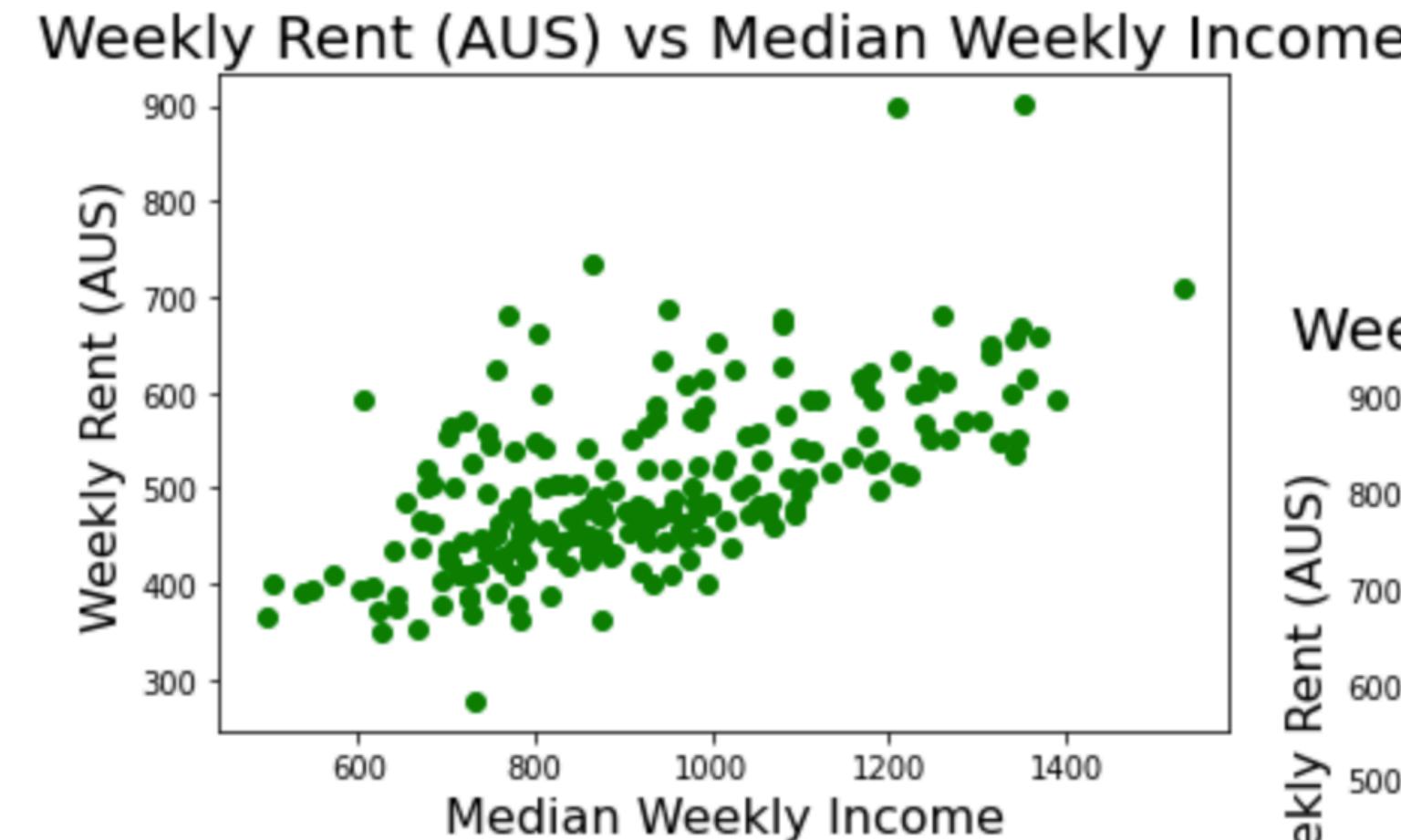


Question 1

The most important features in predicting rental prices

Most important Features

- Using F-Score to reduce the feature space
 - Resulted in the 3 most important features in predicting weekly rent
1. Median property price
 2. Area income
 3. Distance to school



- Most properties scraped reside within the Melbourne area



Model 1

Linear Regression

- Using the most important features we fit a linear regression model
- Evaluated by a 8-fold cross validation
- Coefficient of determination

	Min	Max	Mean	Median
R^2				



Model 2

Multi-layer Perceptron Regressor

- Using the most important features we also fit a regression neural network
- Evaluated by a 8-fold cross validation
- Coefficient of determination

	Min	Max	Mean	Median
R^2				



Usefulness of models

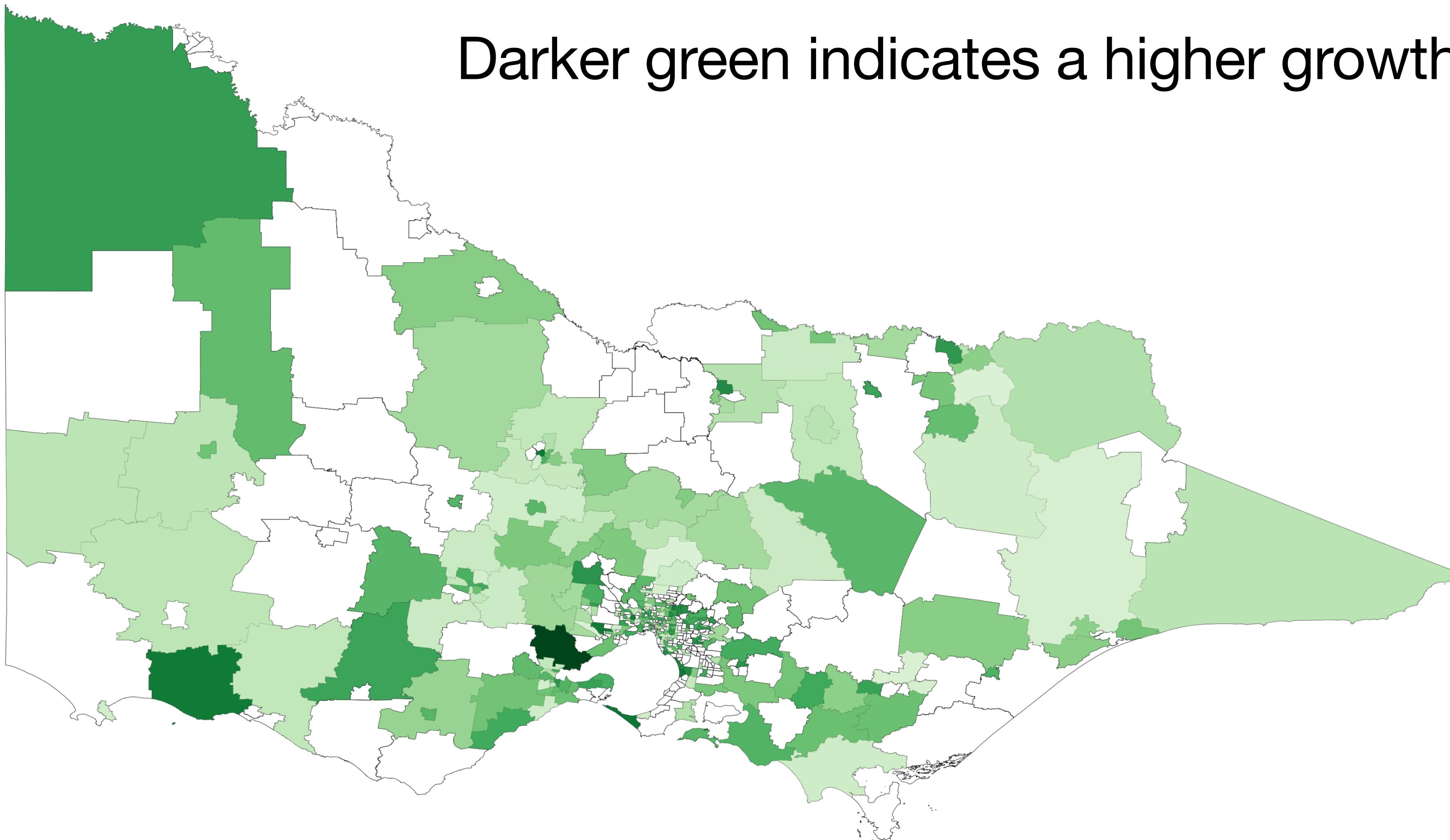
- Using the 3 most important features we can gain a reasonable prediction of what a weekly rent price should be
- This could be used by real-estate companies or individuals looking to rent out a property

Question 2

Top 10 suburbs with the highest predicted growth

Victoria by predicted growth by SA2 zones

Darker green indicates a higher growth rate.



Predict Future Growth

- Predicting which suburbs will have the highest growth benefits for both individual investors and businesses

Statistical Approach

- Originally we attempted to create a linear model
- Little relevant historical data for properties
 - ↳ Growth rate
 - ↳ Dwellings sold for each year
 - ↳ Building approvals.
- The Linear model was run, however we soon had to abandon this statistical approach as the R^2 score (on the data the model was fit on) was an abysmal 0.06.
- May have been improved by adding in interaction terms

Heuristic Approach

- Instead of statistical approach we decided to take a heuristic approach
- This heuristic was based on observations from experts in the property market
- Key indicators found to make a ranking of suburbs
 - ↳ **Clearance rate** ⇒ high clearance rate = high demand
 - ↳ **Average days of market** ⇒ low days on market = high demand
 - ↳ **Non-residential building approvals** ⇒ higher approvals indicate new businesses ⇒ higher value
 - ↳ **Homes sold / population** ⇒ more sales relative to population suggest high demand
 - ↳ **New dwellings / population** ⇒ more houses built made reduce demand and decrease future value
 - ↳ **Growth in previous 3 years** ⇒ area has been increasing in value we assume it is likely to continue
 - ↳ **Growth in current year** ⇒ the same idea as above, but with more recent numbers

Limitations:

- No statistical method, it is simply based on research
- Data not exactly current
 - ↳ For instance we only have 2020-2021 building approvals
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Results

- Top ranking suburbs tended to be south east and or along the Mornington Peninsula.
- These suburbs are generally holiday destinations for many people yet also meet many of our criteria, and have enjoyed recent growth.
- Flinders, Blairgowrie, Tootgarook, McCrae, and Mornington.



Question 3

The most liveable and affordable suburbs

Sales price range

MEDIAN PRICE

\$330k

ENTRY LEVEL

\$180k

HIGH END

\$585k

Sold this year

387

Rental median price

\$350

Auction clearance

40%

Average days on market

120

Higher = more competition

Lower = more competition

Sales and growth

YEAR	MEDIAN	GROWTH	# OF SALES
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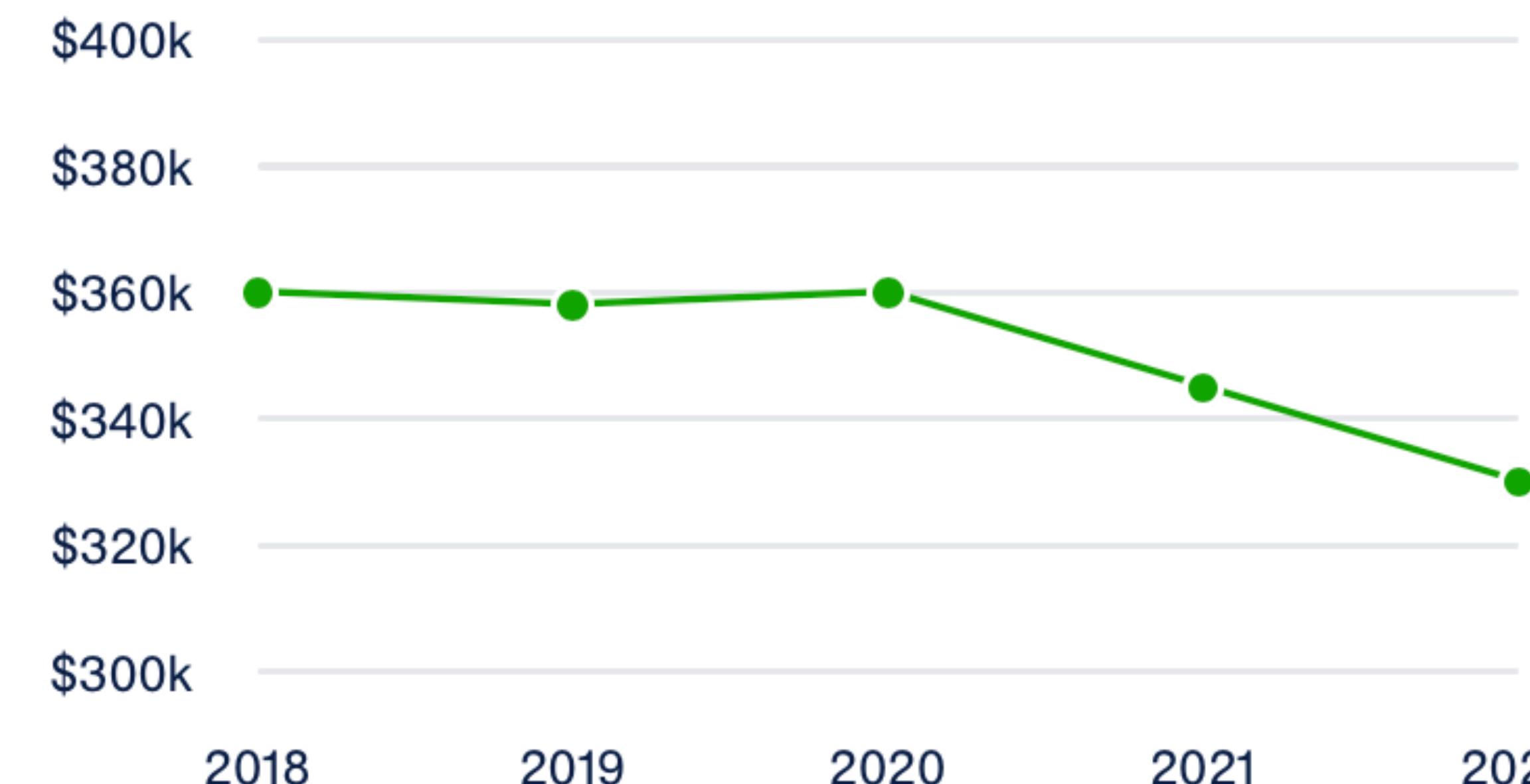
2022	\$330k	-4.3%	387
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2021	\$345k	-4.2%	341
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2020	\$360k	0.6%	420
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2019	\$358k	-0.6%	479
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2018	\$360k	-15.7%	473
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Liveability Scores are based on 8 factors

Percentile Based Scoring



Parks
Proximity & Travel Time



PTV
Proximity & Travel Time



Shopping Centre
Proximity & Travel Time

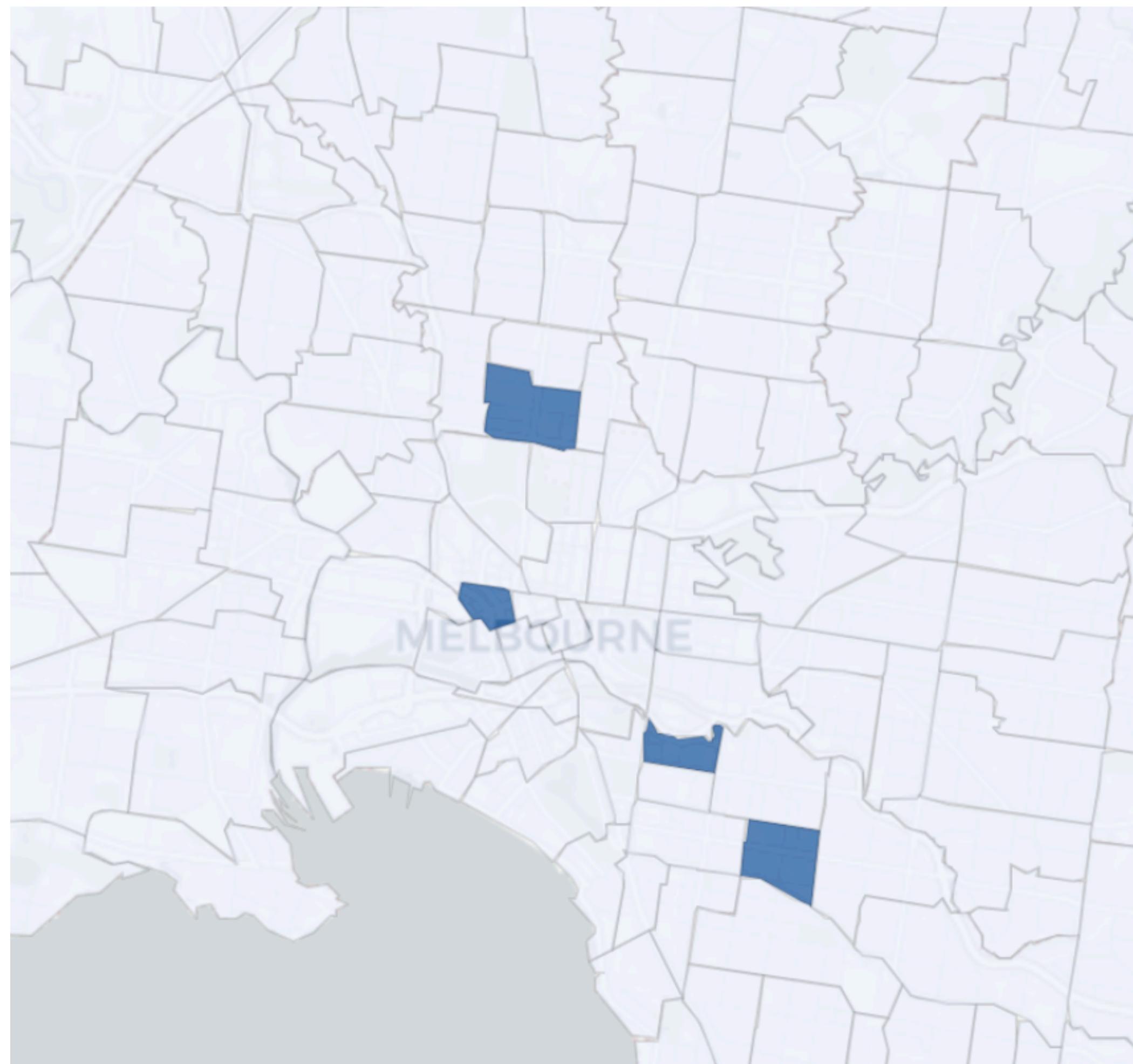


School
Proximity & Travel Time



Inner Melbourne Suburb Dominate Liveability

Top 5 Most Liveable Suburbs



Liveability Score (Lower is Better)

West Melbourne 108

Brunswick 108

South Yarra 109

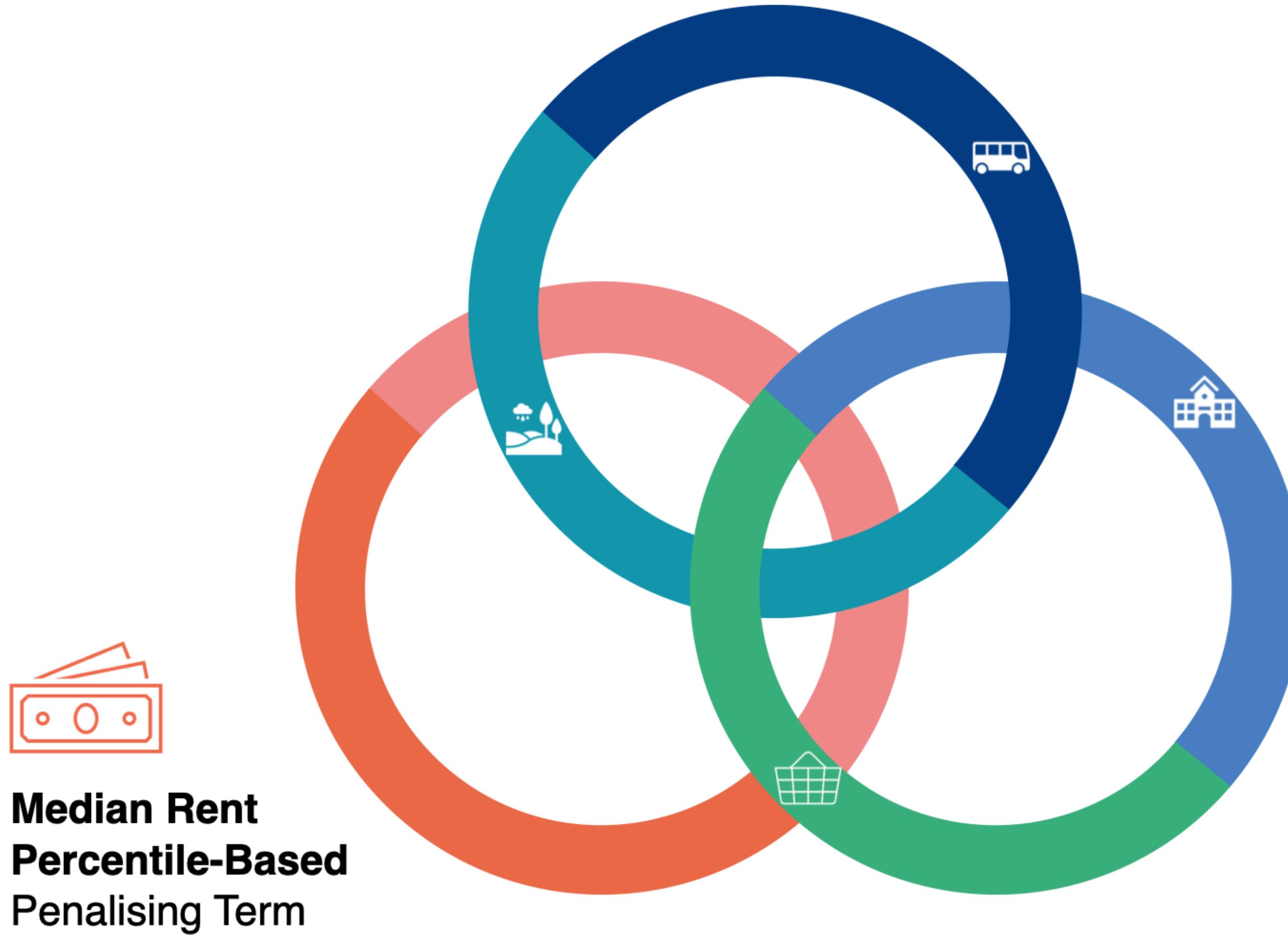
Northcote 130

Armadale 136

Median 505

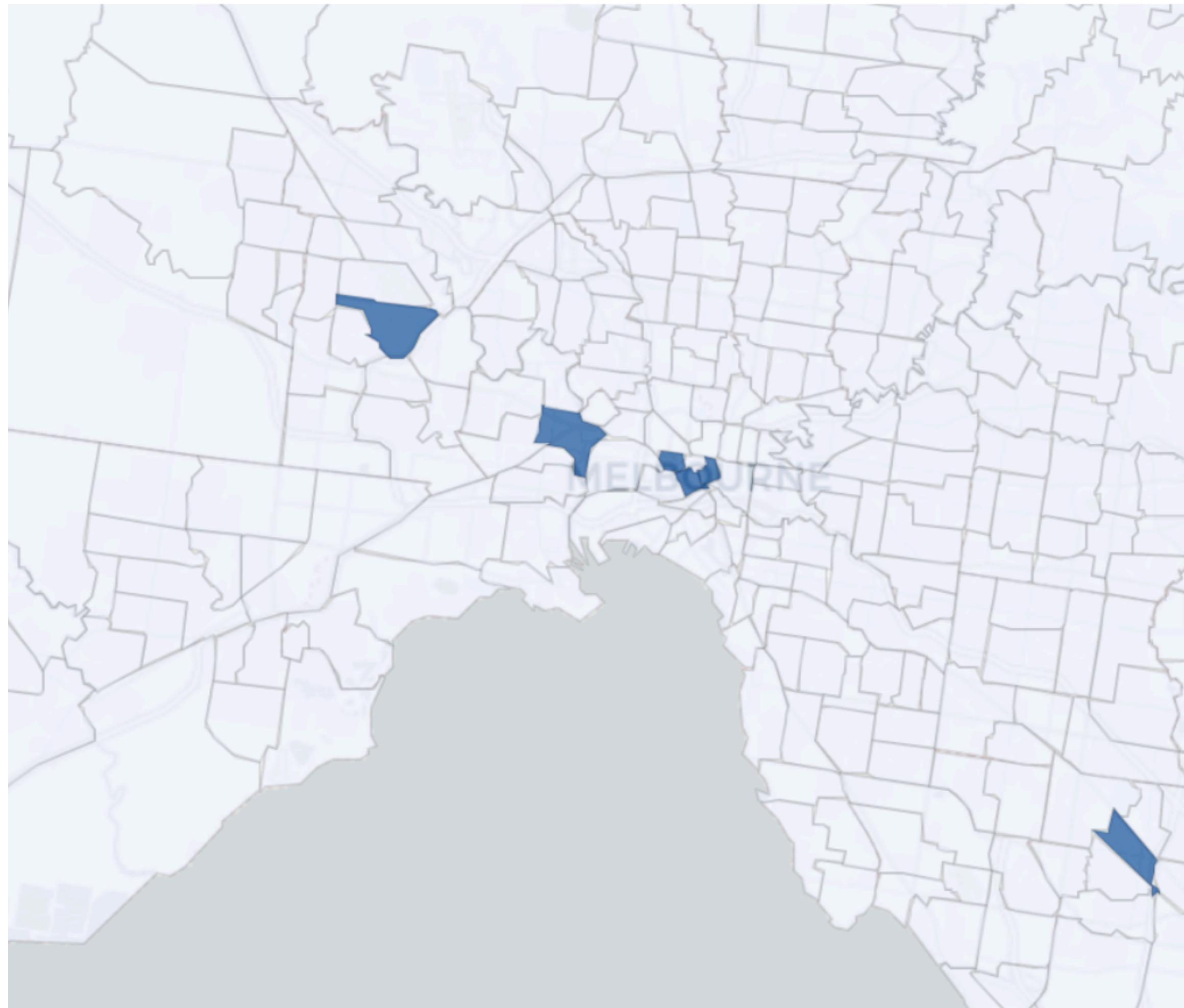
Penalise Rent toward the Median

Percentile Based Scoring

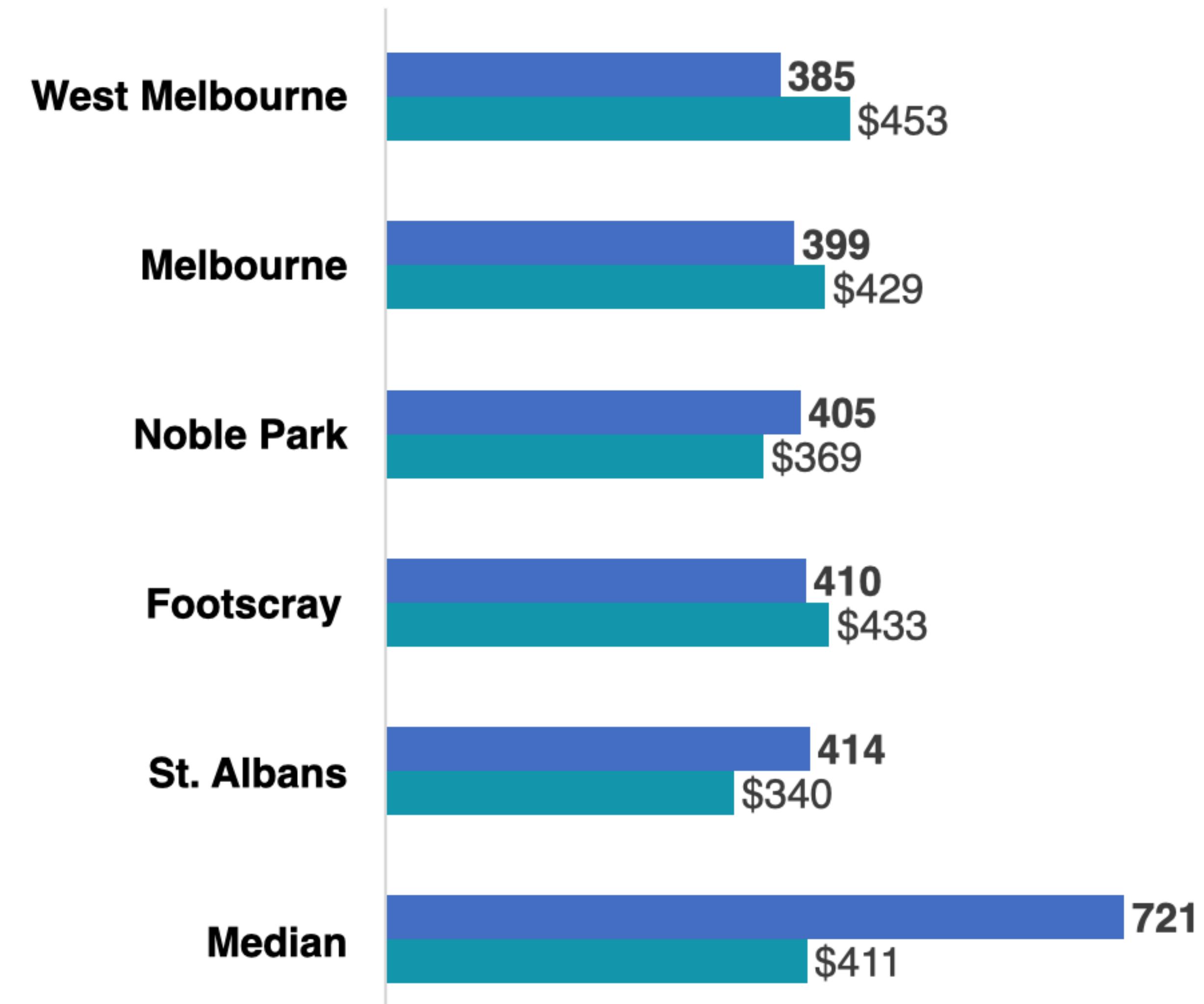


Outwards Pressure to outer Melbourne suburbs

Top 5 Most Liveable and Affordable Suburbs



Liveability score (lower is better) and Rent



References

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Datasets Used

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