

# Optimizing Airbnb Performance in New Zealand : Pricing, Segmentation & Guest Insights

BY: ROHAN CHAWLA

LOCATION

New Zealand

CHECK IN

Add Date

CHECK OUT

Add Date

 Search



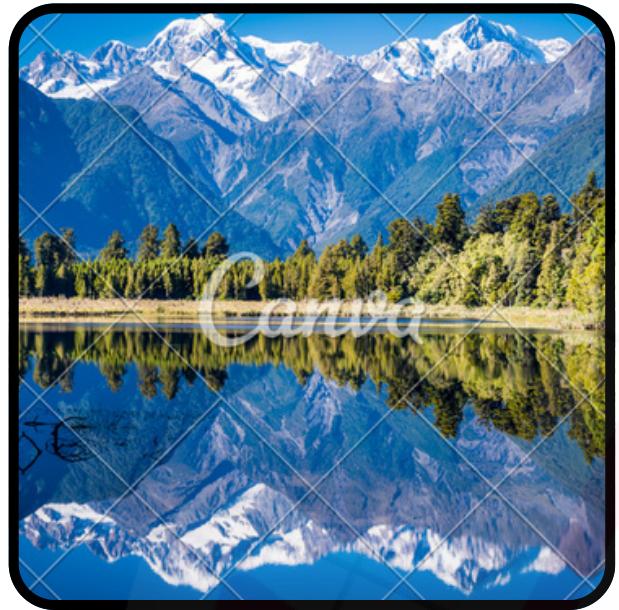
# DATA OVERVIEW



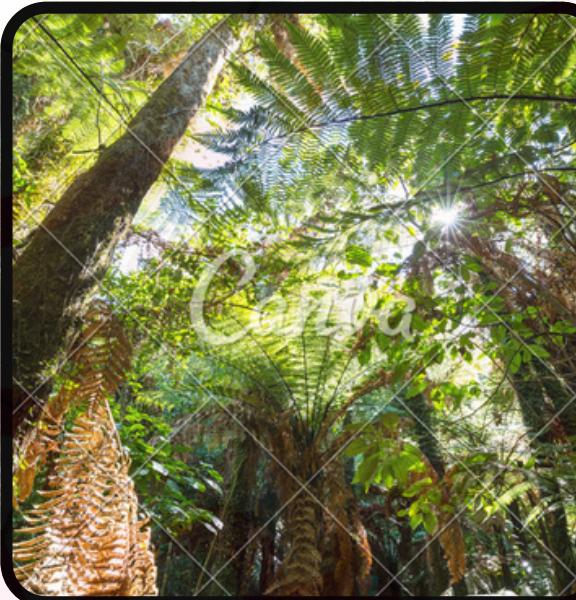
**Period**  
Jul 2024 – Jun  
2025 (12 months)



**Missing Values**  
1.16%



**Size**  
576,621 rows ×  
86 columns



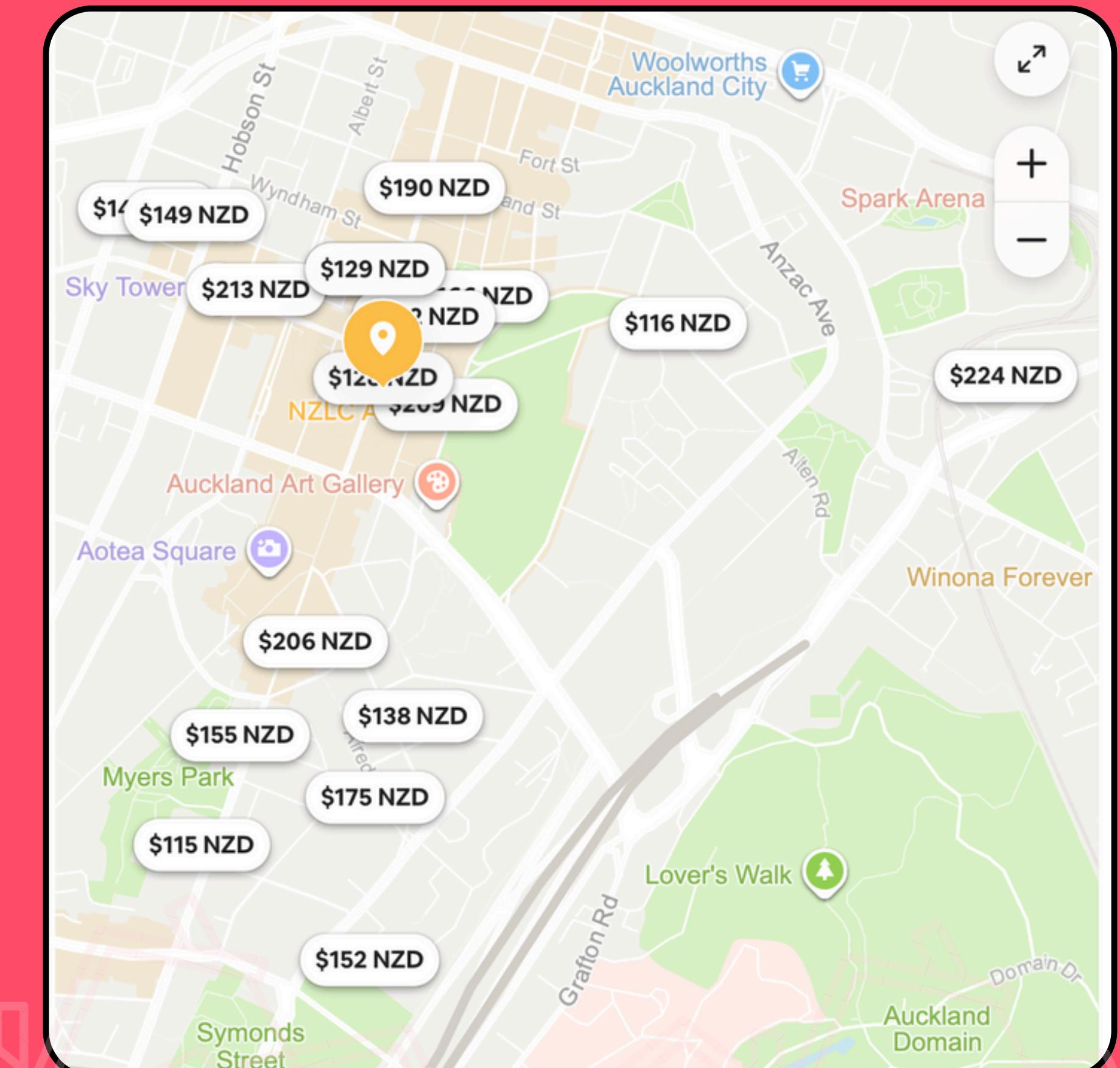
**Data Type**  
Panel Data



**Focus Region**  
Auckland &  
Queenstown



Over a 12-month period,  
what are the main drivers  
of Airbnb listing prices in  
New Zealand, and how  
can host characteristics,  
property features, and  
seasonal trends be  
leveraged to optimize  
pricing strategies?

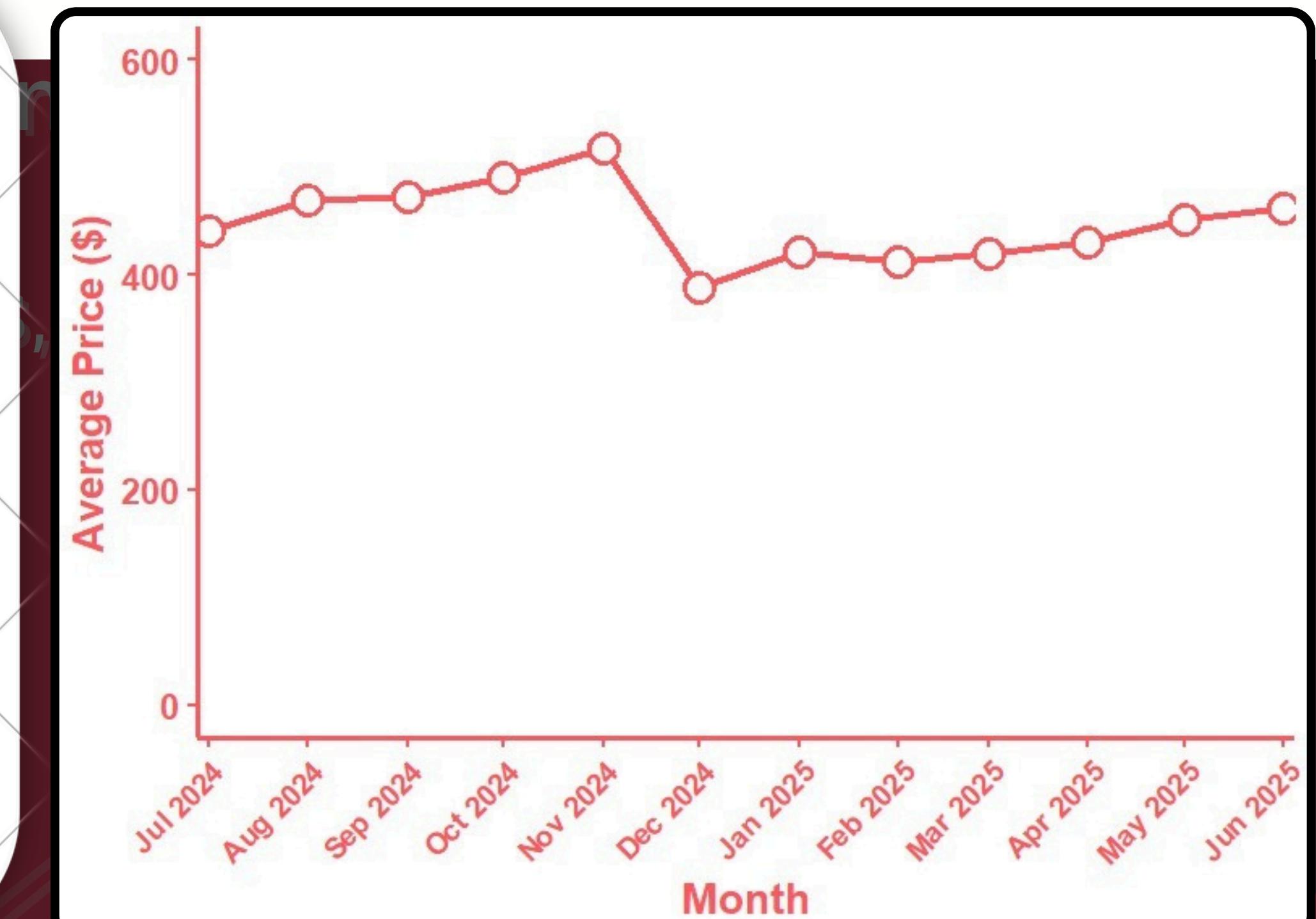


Where

AIRBNB PRICES (12 Months)

Check in  
Add datesCheck out  
Add datesWho  
Add guests

Search

 Provides an overview of monthly price fluctuations and overall trend. Peak: Nov–Dec (~520 NZD) Drop: Jan (~390 NZD) Seasonal trend visible Gradual recovery: Feb–Jun



Homes near Auckland Auckland NZ

Any week

Add guests



Filters



## GOAL

Identified key Airbnb price drivers using panel regression analysis.



## DATA

- 12 monthly snapshots (NZ, Jul–Jun)
- Mixed types: numeric / categorical / binary



## BUILD

Merge month-wise CSVs → unbalanced and irregular panel structure



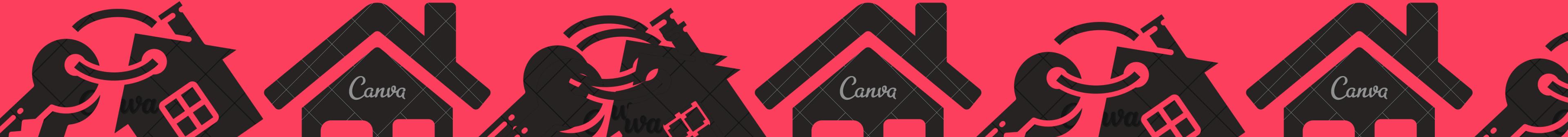
## CHECKS

NA audits, distribution spot-checks, integrity verified



## CLEANING

- Schema harmonized across months
- De-duplication: unique listing × month
- Missing data: global mean/median/mode + logic-based imputations
- Keep listings observed > 8 months (9–12)





# HAUSMAN TEST

Fixed Effects (Two-Ways)				
Predictors	Estimates	std. Error	Statistic	p
accommodates	0.040	0.007	5.775	<0.001
review scores accuracy	0.075	0.017	4.417	<0.001
review scores checkin	-0.021	0.006	-3.671	<0.001
review scores communication	0.092	0.015	6.256	<0.001
number of reviews	-0.000	0.000	-6.251	<0.001
number of reviews l30d	-0.002	0.000	-5.201	<0.001
bedrooms	0.011	0.003	3.310	0.001
availability 90 × number of reviews l30d	-0.000	0.000	-6.562	<0.001
accommodates × review scores accuracy	-0.005	0.001	-3.465	0.001
review scores accuracy × review scores communication	-0.017	0.003	-5.170	<0.001
accommodates × reviews per month	-0.001	0.000	-3.622	<0.001
number of reviews × bedrooms	-0.000	0.000	-3.003	0.003
Observations	466400			

## Hausman Test — Fixed vs Random Effects

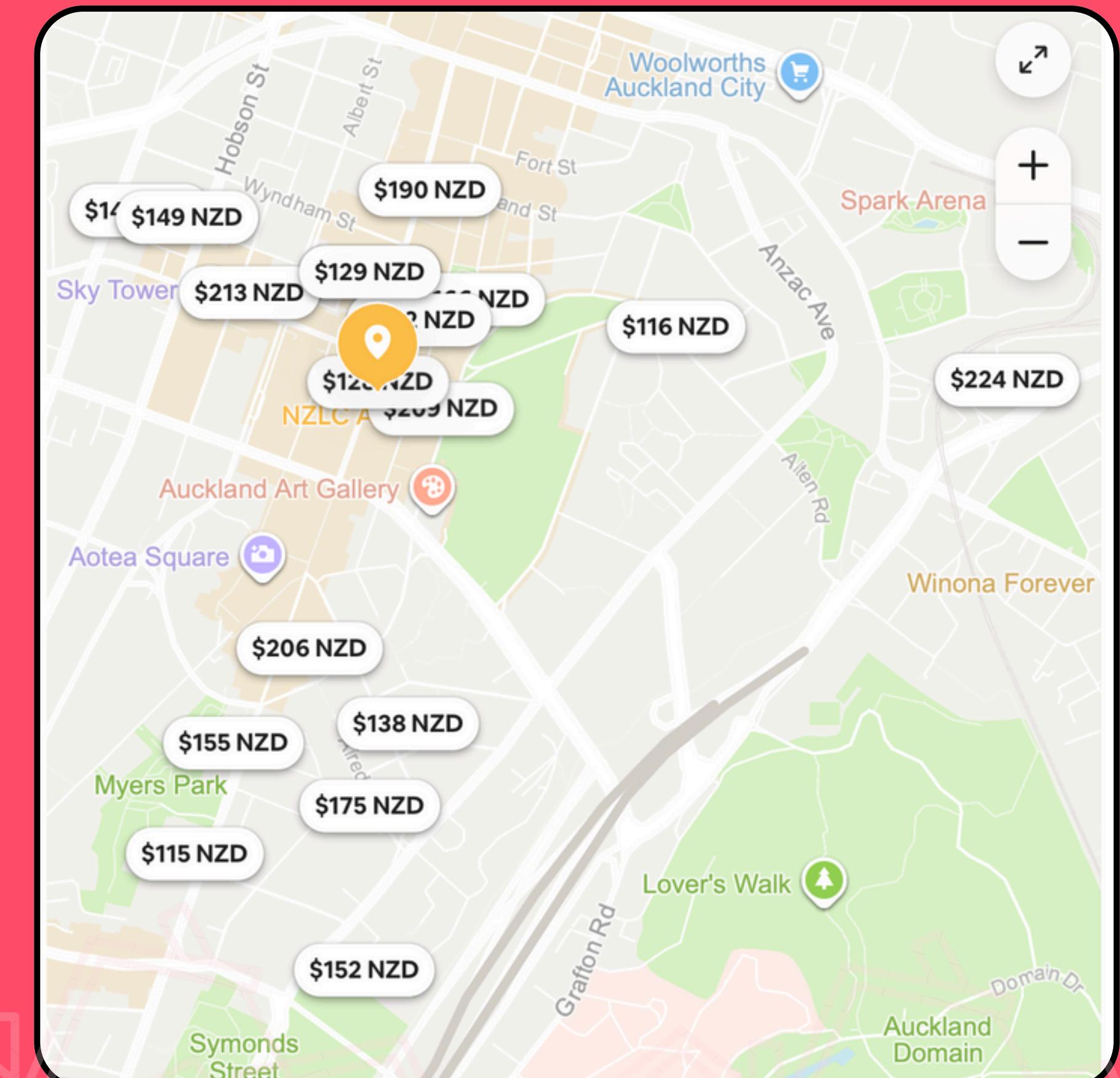
Test	Chi.square	df	p.value	Decision
Hausman (FE vs RE)	17643	18	<1e-16	FE preferred (RE inconsistent)

- Result: Fixed Effects preferred (Random Effects inconsistent)
- Key Drivers ( $\uparrow$  Price)
- Accommodates: +4% per extra guest
- Bedrooms: +1.1% per room
- Review score – Communication: +9%
- Review score – Accuracy: +7.5%
- Interactions (diminishing returns)
- Availability × Reviews (30d) → Negative
- Accommodates × Accuracy → Negative
- Accuracy × Communication → Negative





Which are the two most populated cities in New Zealand in terms of Airbnb listings, and how can we segment their properties — based on price, review scores, amenities, and other characteristics — to identify distinct market clusters?



Where  
**NZ Regional Listings**

Check in  
Add dates

Check out  
Add dates

Who  
Add guests

 Search

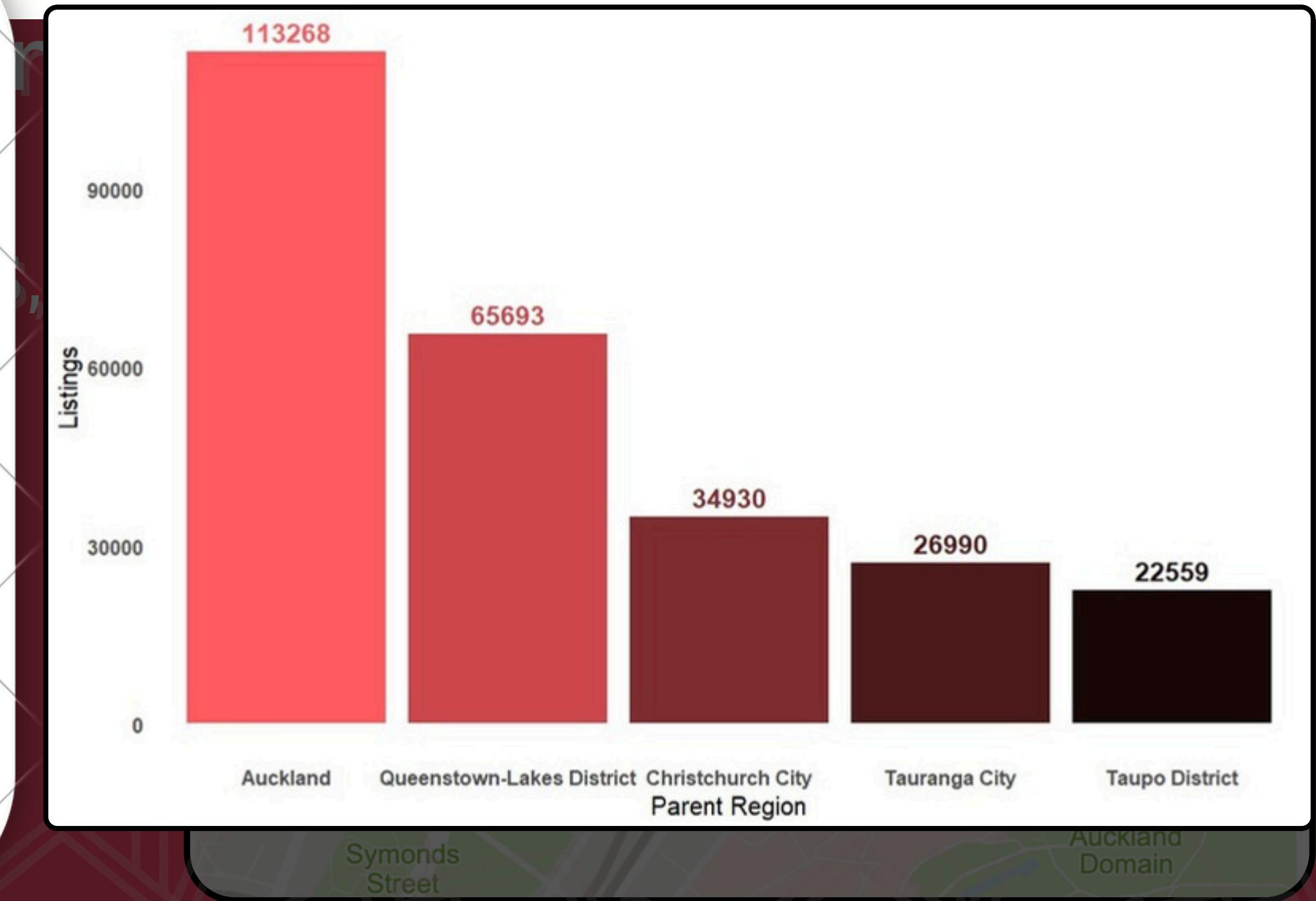
Shows Auckland and Queenstown  
as key focus areas due to their  
high listing concentration.

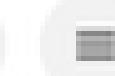
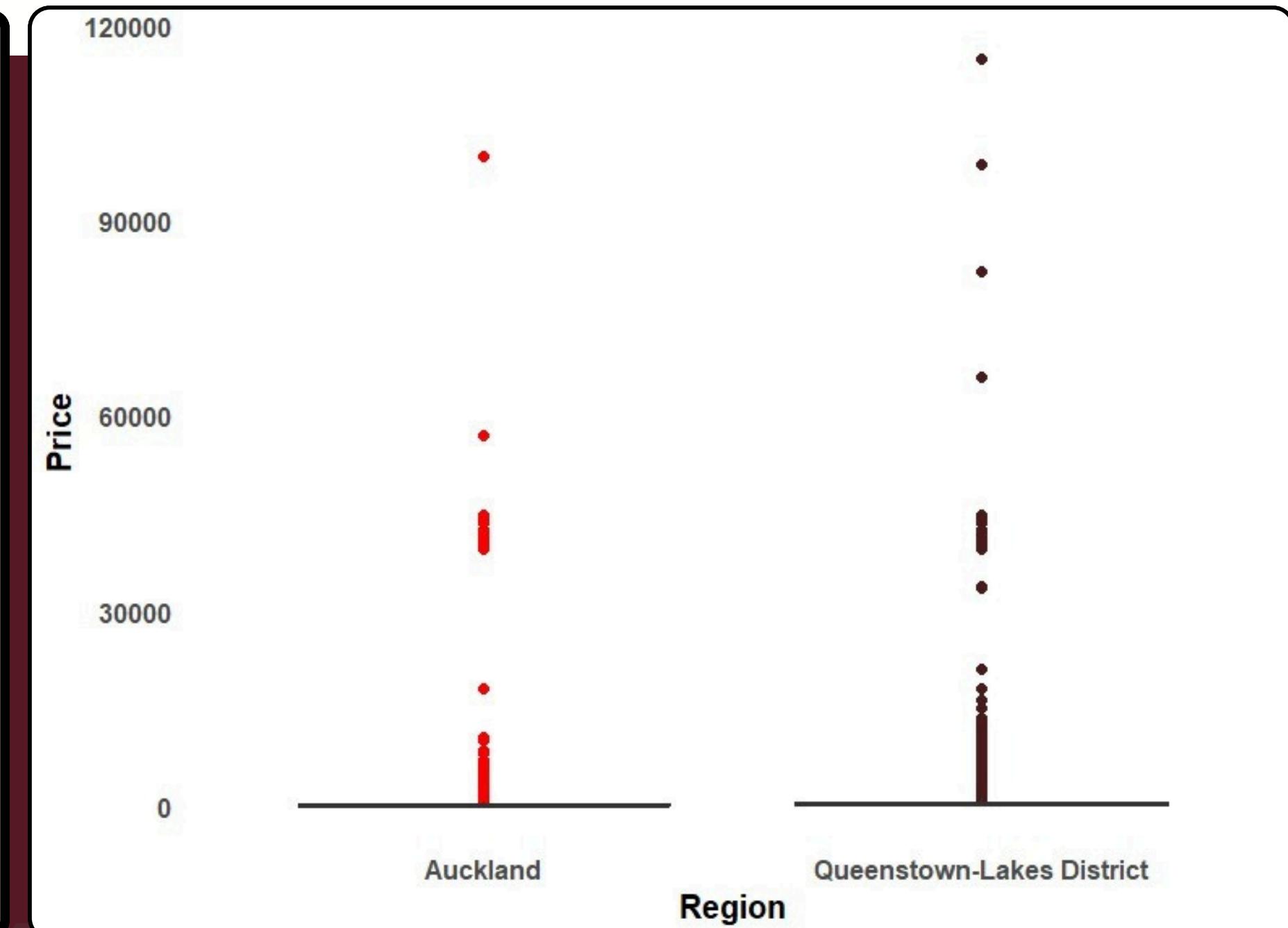
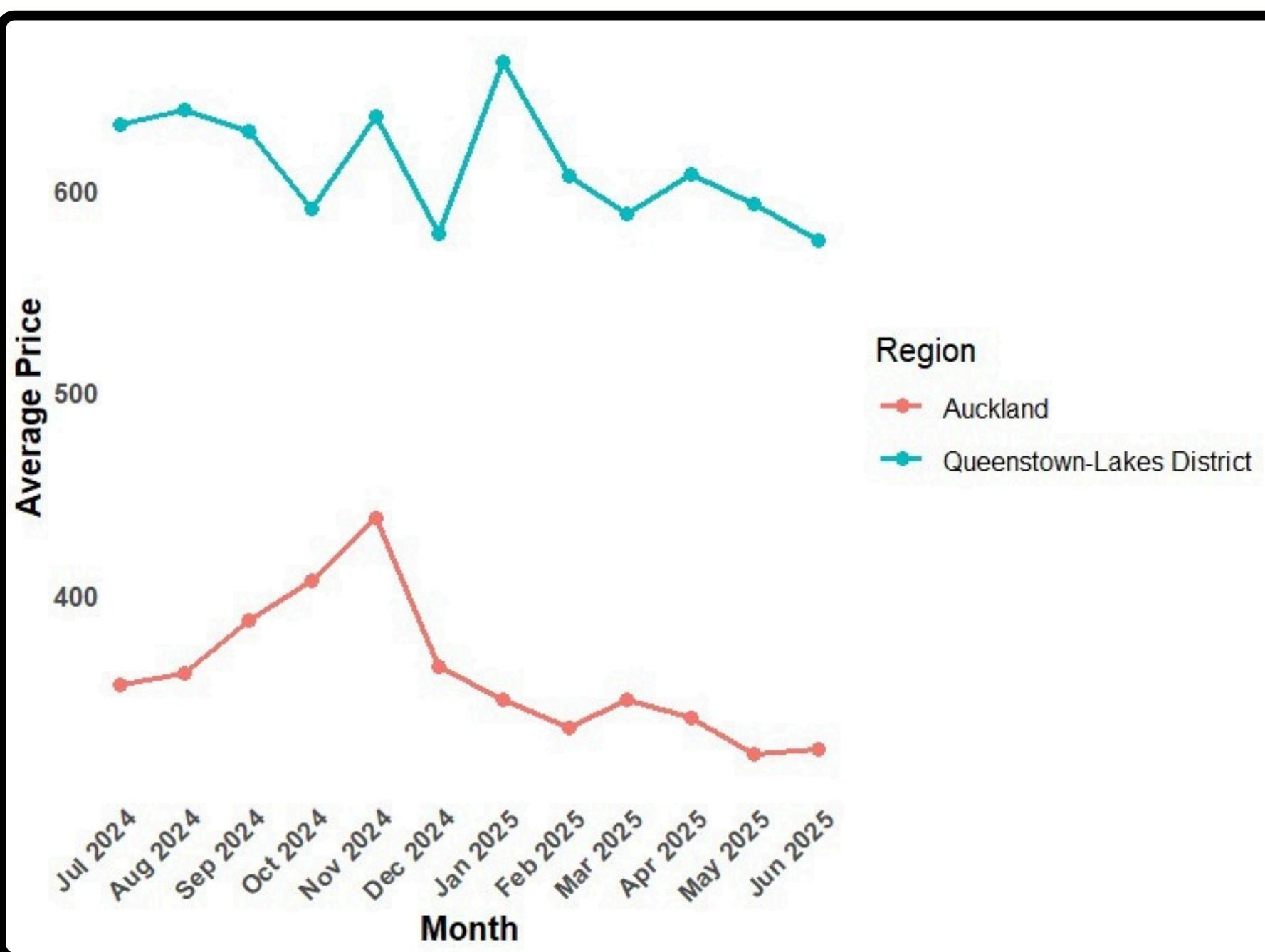
Auckland: ~100k+ listings  
(highest)

Queenstown: ~65k listings  
(2nd)

Christchurch ~35k

Clear dominance: Auckland  
+ Queenstown



Where  
**NZ Regional Listings**Check in  
Add datesCheck out  
Add datesWho  
Add guests Search



Homes near Auckland Auckland NZ

Any week

Add guests

Filters

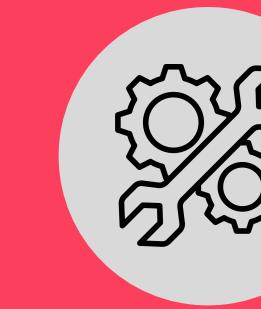


# DATA PREPARATION



## DATA CLEANING

Consolidated multiple snapshots into unique listings by ID and handled missing values using mean/mode imputation.



## FEATURE ENGINEERING

Converted categorical flags like Superhost and Instant Bookable into numeric form, and added new features such as description length, amenities count, and host tenure.



## AUCKLAND

With over 100k+ listings, Auckland stands as New Zealand's largest Airbnb market, offering a diverse mix of urban stays and catering to a wide traveler base.



## QUEENSTOWN

With around 65k listings, Queenstown is a premium tourist hub, attracting visitors for its scenic appeal and showing strong seasonal demand for Airbnb stays.



# NEW ZEALAND

Auckland  
(3 clusters)

Family-Friendly  
Homes  
(\$327,  
4–5 guests)

Budget Private  
Rooms  
(\$111,  
2 guests)

Ultra-Luxury  
Retreats  
(\$35K,  
niche)

Reliable  
comfort  
(2,057 listings,  
~\$536)

Standard  
hosts  
(1,970 listings,  
\$472)

Signature  
Stays  
(17 listings,  
\$36K)

High-Value  
superhosts  
(2,390 listings,  
\$665)

Budget friendly  
Private Rooms  
(824 listings,  
\$182)

Queenstown  
(5 clusters)



# AUCKLAND

(Silhouette = 0.57)

CLUSTER	SIZE	ROOM TYPE	ACCOMODATES	PRICE	AMENITIES	DESC_LENGTH	NO. OF REVIEWS	MIN_NIGHTS
Family- Friendly Homes	9935	Entire Home	~4	~327	~37	400	~10	~3
Budget Private Rooms	3974	Private Room	2	~111	~26	~349	~6.11	~2
Ultra- Luxury Retreats	35	Entire Home	5	~35000	~24	~191	~1	~1

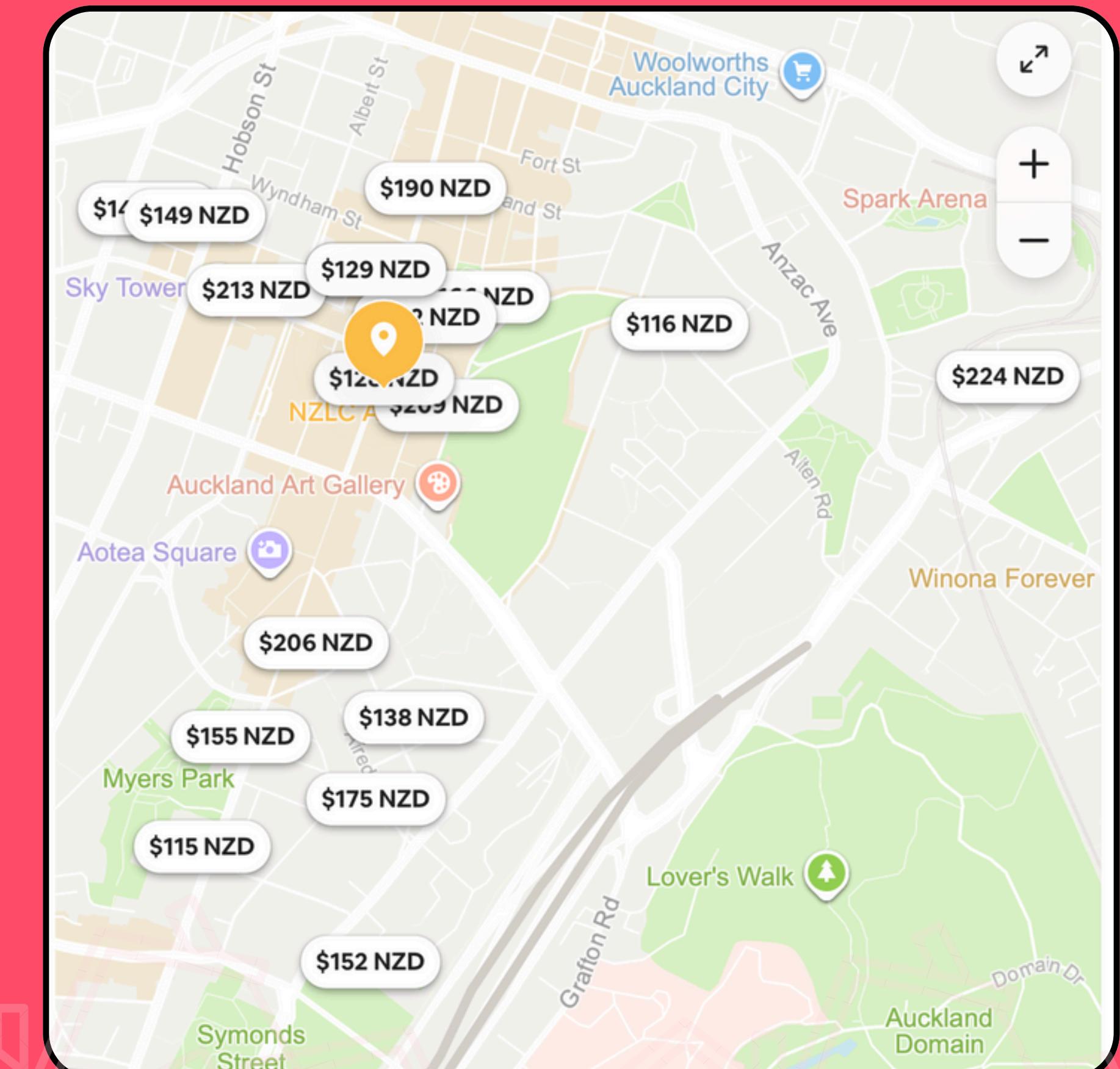


# QUEENSTOWN (Silhouette = 0.46)

CLUSTER	SIZE	ROOM TYPE	PRICE	SUPERHOST	INSTANT BOOKABLE	NO. OF REVIEWS	AMENITIES _COUNT	DESCRIPTION_LENGTH	HOST_ACCEP TANCE_RATE
Reliable Comfort	2057	Entire Home	~536	Yes	No	~18	44	~385	~94
Standard Hosts	1970	Entire Home	472	No	No	~5	~35	~386	83
High Value Superheats	2390	Entire Home	~665	Yes	Yes	~15	42	~390	~98
Budget-Friendly Private Rooms	824	Private Room	~182	Yes	No	~16	29	~388	~88
Signature Stay	17	Entire Home	~36,3 50	No	Yes	~1	26	~166	~99



What are the dominant sentiments and emotions expressed in Airbnb guest reviews across New Zealand over the period of 12 months?



Where

**Monthly Reviews**Check in  
Add datesCheck out  
Add datesWho  
Add guests Search

Checks if review peaks align with seasonal price peaks.



Peak: Dec (510k reviews)



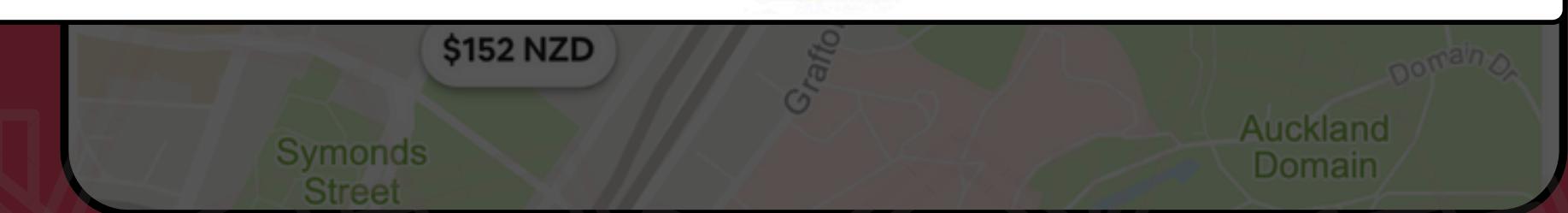
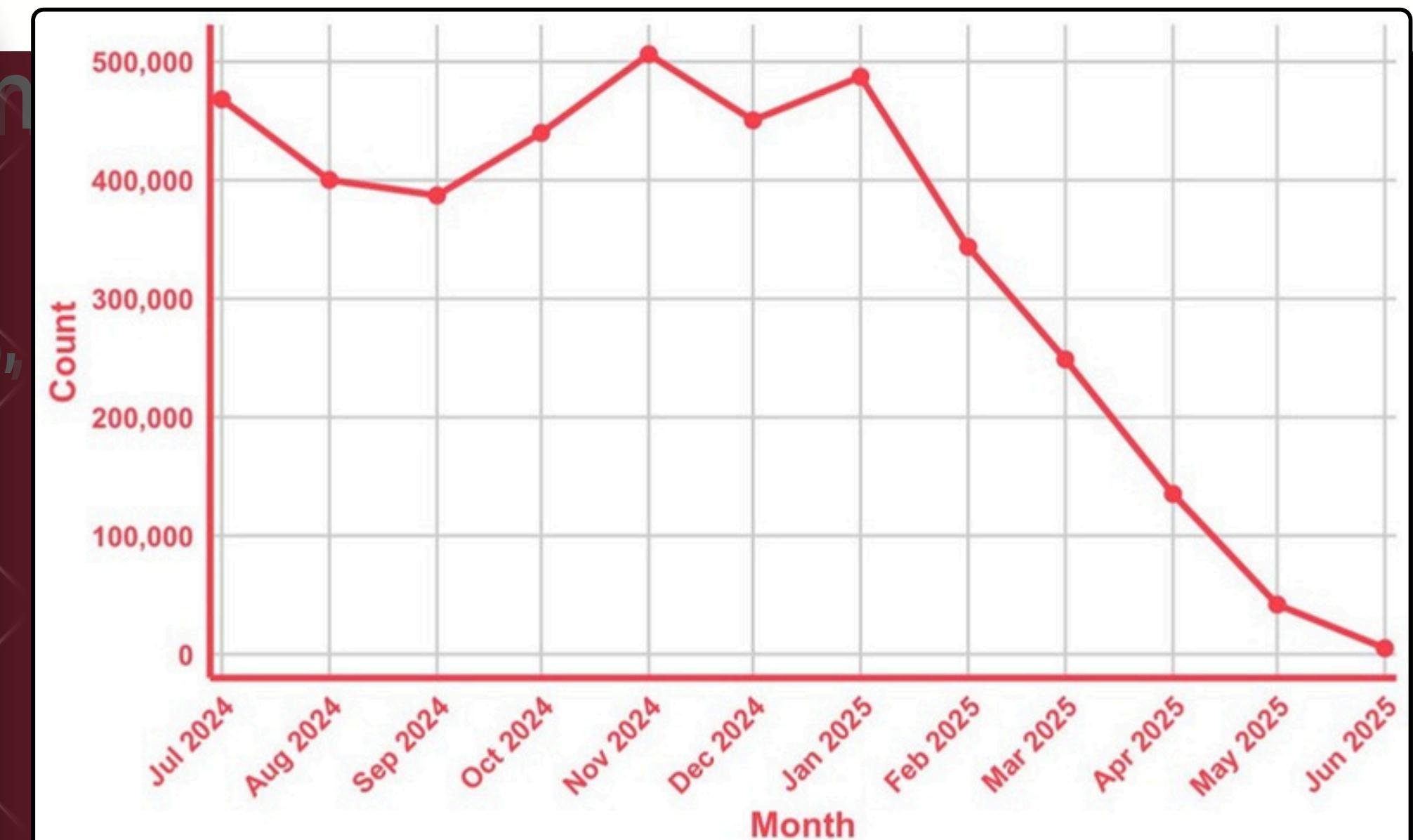
Decline: Jan onward



Sharp fall Apr–Jun



Guest engagement seasonality





Homes near Auckland Auckland NZ

Any week

Add guests



Filters



Our analysis was based on 33,948,195 observations, of which only 619 were missing values.

Total Positive Words	Total Negative Words	Total Words	Percentage Positive
16411762	977465	17389227	94.4

Percentage Negative	Net Positive Word(%)	Average Positive Words	Average Negative Words
5.62	88.8	23.7	1.41





Homes near Auckland Auckland NZ

Any week

Add guests

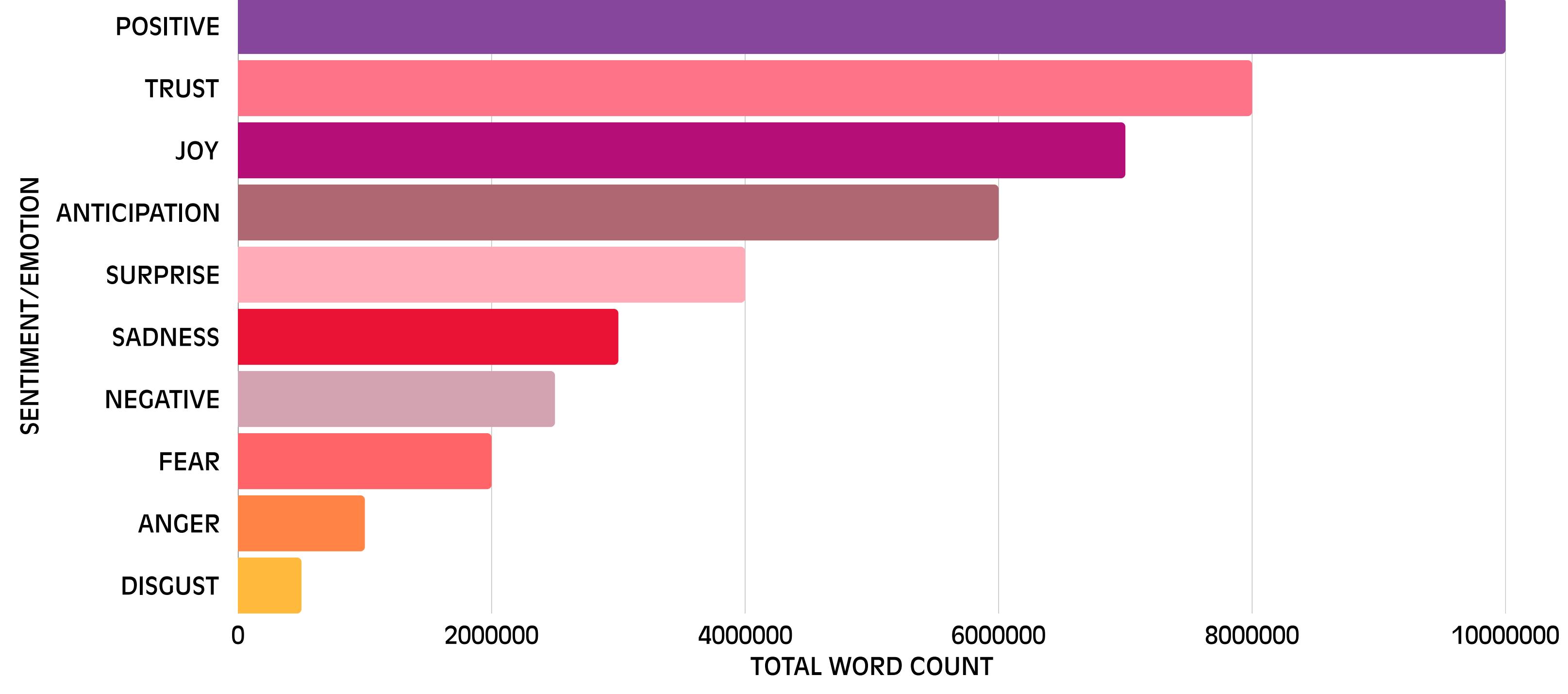


Filters



## OVERALL EMOTION DISTRIBUTION

● POSITIVE   ● TRUST   ● JOY   ● ANTICIPATION   ● SURPRISE   ● SADNESS  
● NEGATIVE   ● FEAR   ● ANGER   ● DISGUST



# comfortable

# POSITIVE WORD CLOUD



# NEGATIVE WORD CLOUD



# THANK YOU

