



SPICED

Exploratory data analysis of home sales in Seattle

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Buyer : Jennifer Montgomery



- high budget,
- wants to show off,
- timing within a month,
- waterfront, renovated,
- high grades,
- resell within 1 year

Seller : Timothy Stevens



Common goals

- Location
- Living area
- Grade
- Waterfront
- Renovation
- selling/buying time

- owns expensive houses in the center, needs to get rid,
- best timing within a year,
- open for renovation when profits rise

Buyer : Jennifer Montgomery/Seller :Timothy Stevens

Demands from clients:

1. Which is good place(**zipcode**), with renovation and waterfront in Seattle to buy/sell a house?
2. What is best months to buy/sell house?
3. What the best price based on grade, waterfront and renovation?

Hypothesis 1 : Houses located closer to the city center have higher prices than those far away.

Independent variable : Distance from city center (**lat, long**)

Dependent variable : House price (**price**)

Hypothesis 2 : Homes with larger living sizes, Bedrooms, Bathrooms have higher prices, independent of house size.

Independent variables : Living sizes, Bedrooms, Bathrooms (**sqft_living, sqft_living15, bedrooms, bathrooms**)

Dependent variable : House price (**price**)

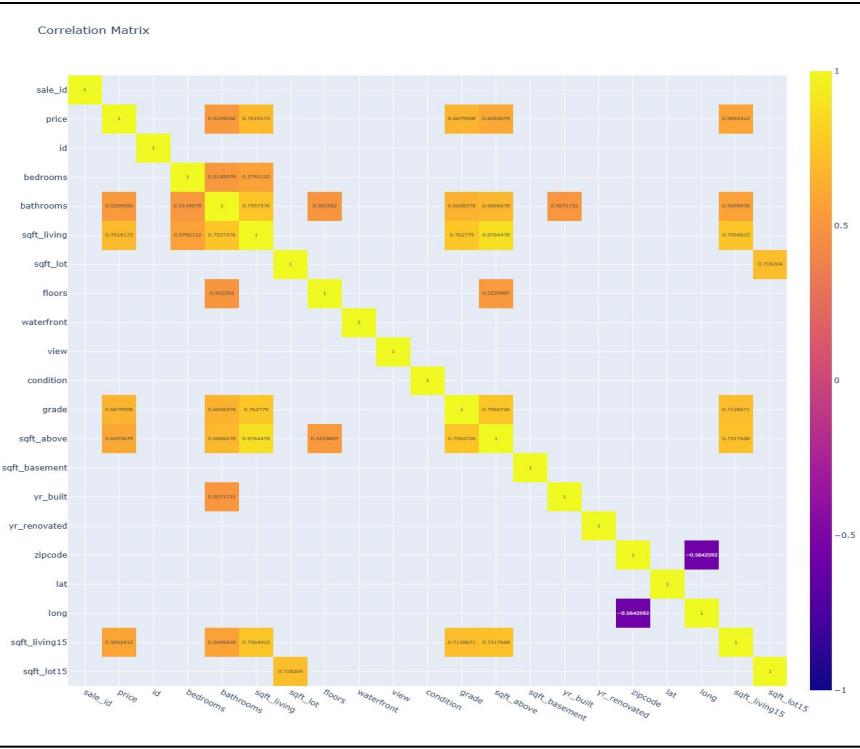
Hypothesis 3 : Good grade homes have higher sale prices than with lower homes

Independent variables : Grades (**grade**)

Dependent variable : House price (**price**)

Final deal : (Grade+renovation+waterfront) +(month)+(location+price) = **Deal!**

Correlation Matrix

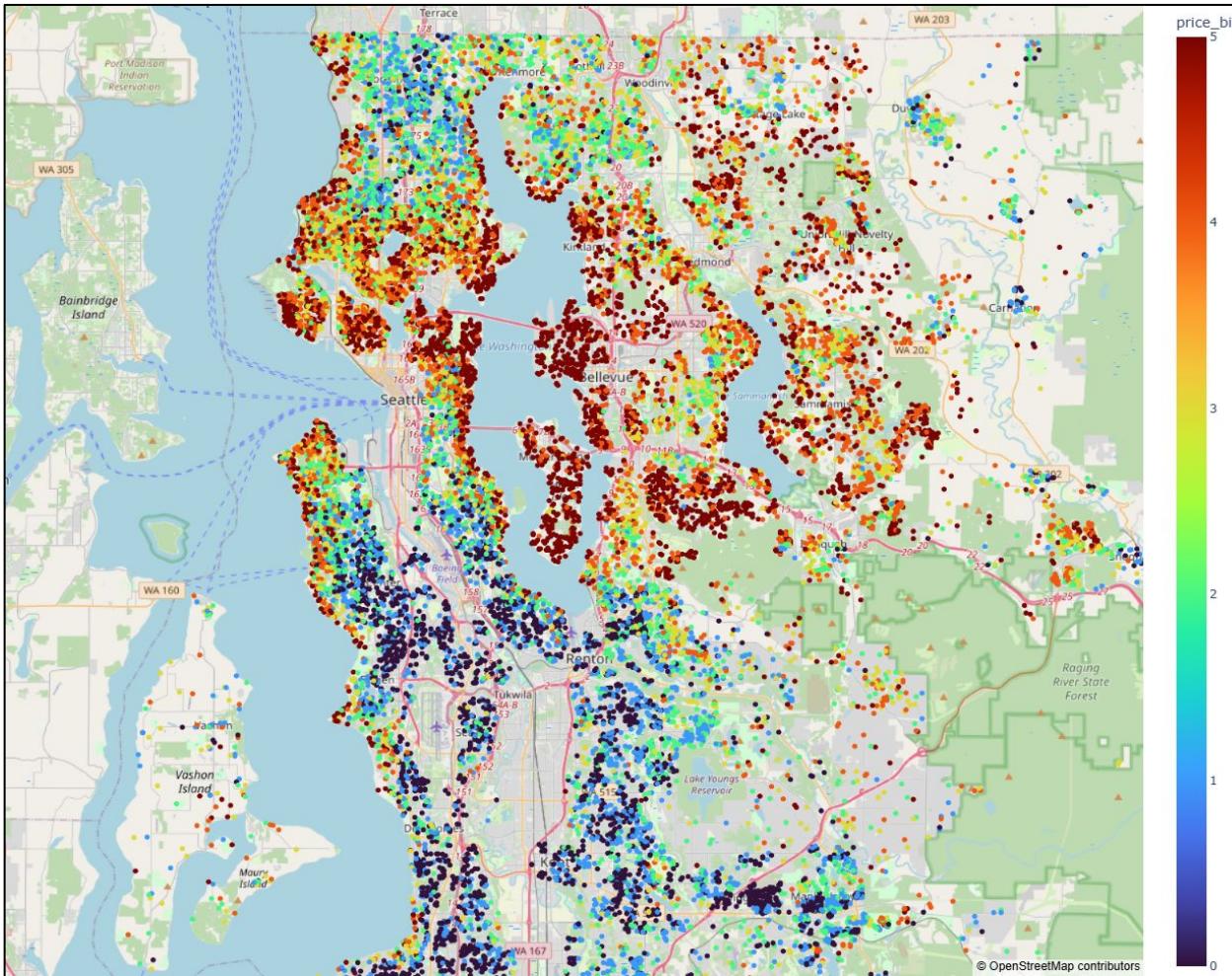


Data to decision

- Grade has good impact on price.
- The living space area contributes to high prices.
- Luxurious bathrooms makes it more expensive.

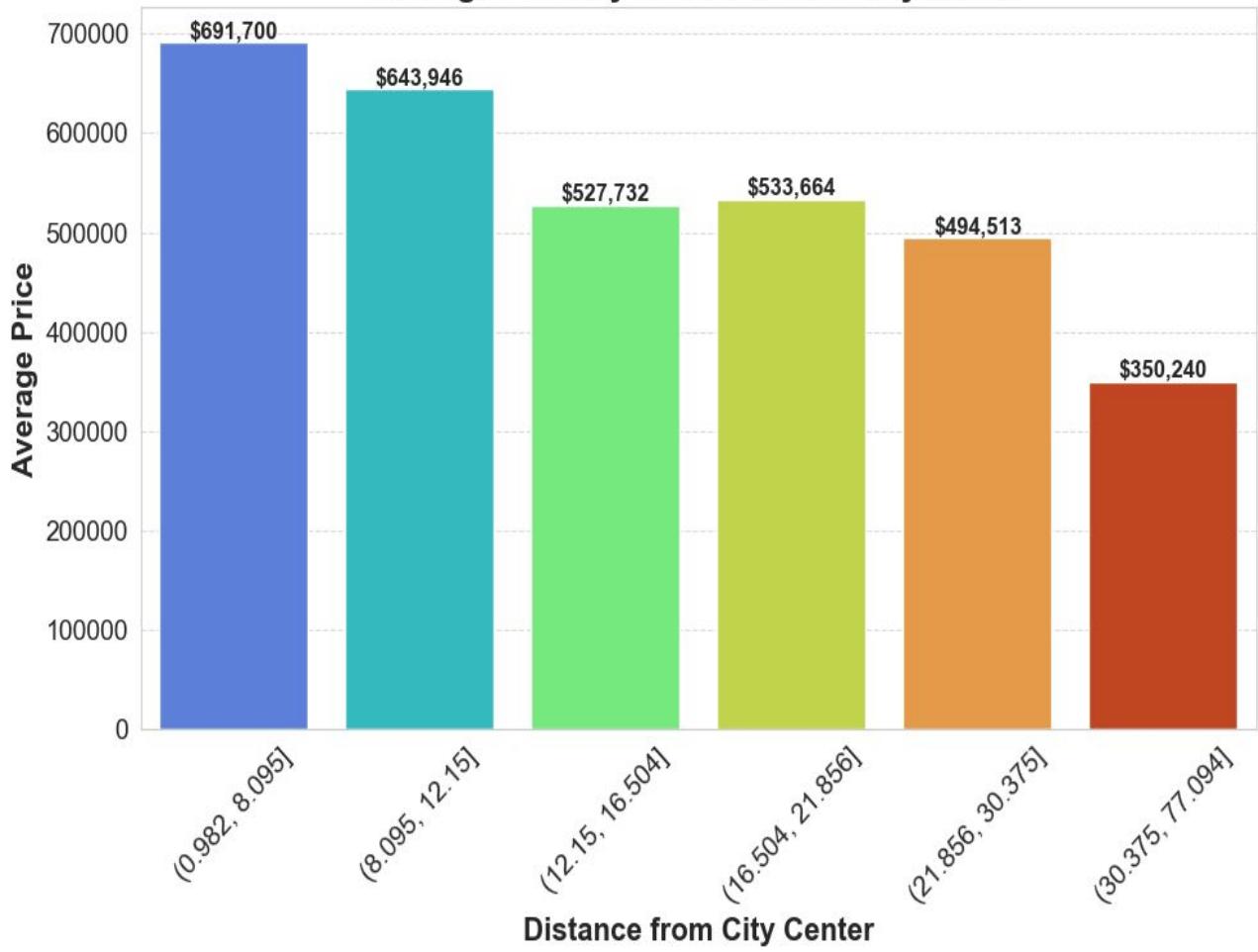
Cov	Grade	Bathrooms	sqft_living	sqft_living15
Price	0.52	0.66	0.70	0.58

Hypothesis 1 : Houses located closer to the city center have higher prices than those far away.



- The area near the city center shows high price.
- Area surround near waterfront has big cloud of expensive houses.
- The suburbs in south is cheap housing.
- Buy/sell near to city center.

Average Price by Distance from City Center



Prices Decrease as Distance Increases

- Properties closer to the city center are more expensive.
- There is a **negative relationship (-0.29)** between distance and price.
- Central locations likely have:
 - ❖ Better accessibility
 - ❖ More amenities
 - ❖ Higher demand

Hypothesis 2 : Homes with larger living sizes, Bedrooms, Bathrooms have higher prices, independent of house size.

Price vs Living Space (`sqft_living`)

Overall Pattern

- There is a **strong positive relationship (0.70)** between total living space and price.
- As square footage increases, price generally increases.

Key Observations

- Most homes cluster between **1,000–5,000 sqft** and **\$200k–\$2M**.
- There are **extreme luxury outliers** (e.g., 10,000+ sqft homes priced \$6M–\$8M).

Interpretation

- Size is a **major driver of price**.
- However, variability increases with size.



Price vs Bathrooms

1. Strong Positive Relationship

As the number of bathrooms increases, **home prices generally increase**.

This suggests bathrooms are strongly correlated(**0.66**) with overall house size and luxury level.

2. Increasing Price Variability

The **spread (variance)** of prices grows with more bathrooms:

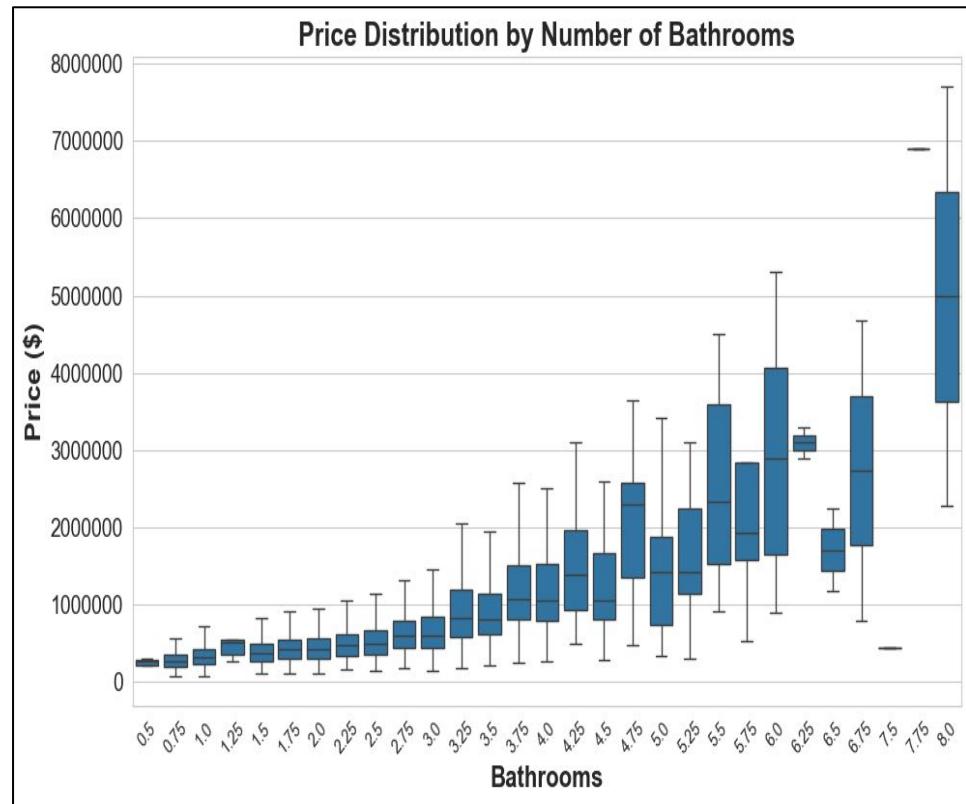
- Lower bathroom counts → tighter price ranges.
- Higher bathroom counts (5+) → very wide price ranges.

3. Presence of Outliers

There are clear **high-end outliers**, especially:

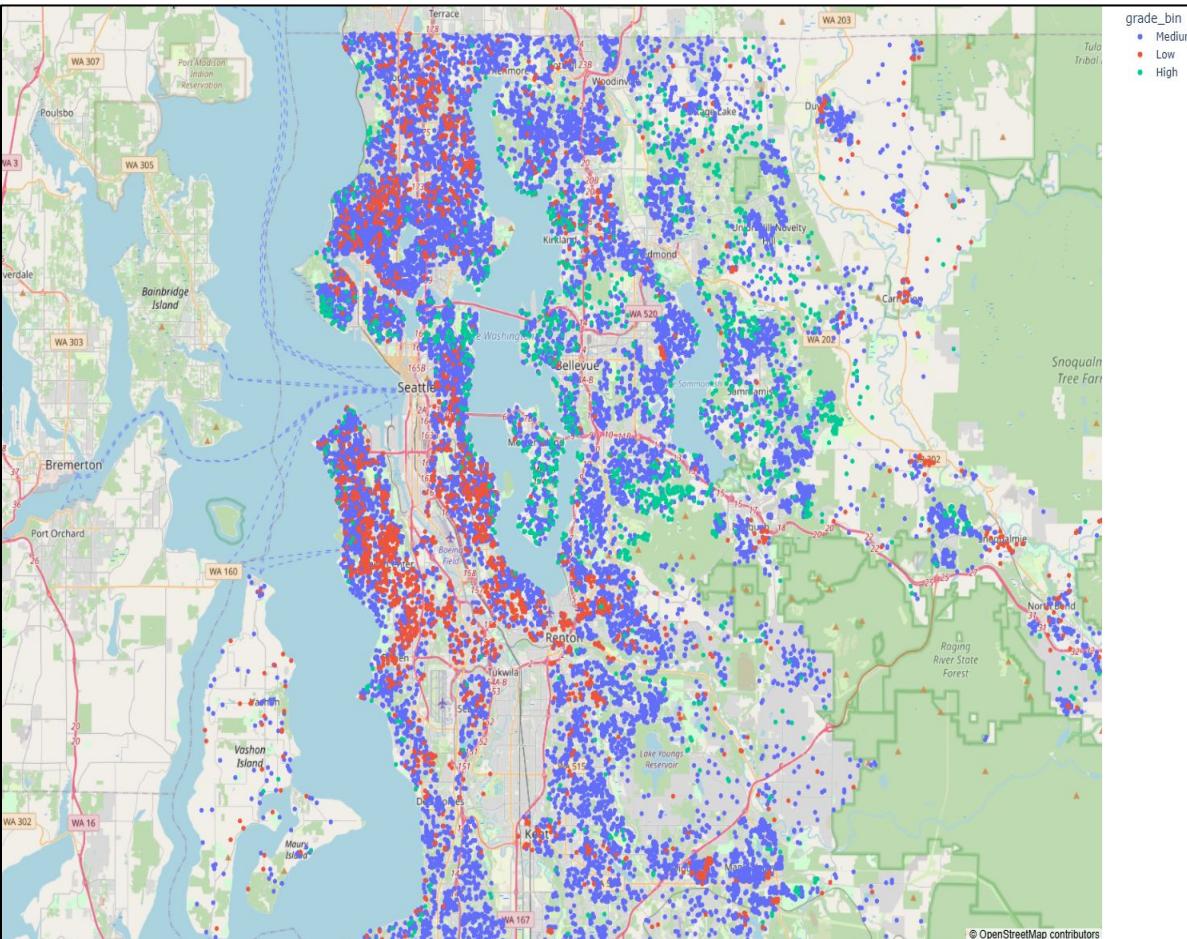
- 5–8 bathroom homes
- Some reaching **\$7M–\$8M**

These likely represent luxury estates or premium properties.



**Price negotiation for clients renovation
for seller, showoff for buyer.**

Hypothesis 3 : Good grade homes have higher sale prices than with lower homes



- The area near the city center have high grades.
- The suburbs in south has medium and lower grades
- The premium luxurious houses with good grades are near waterfront.
- Buy/Sell the properties near to Pioneer Square.

King County Residential Grade Scale (Approximate)

King County typically uses a scale like this:

Grade	General Meaning	Bins
1-3	Very basic / substandard construction	Low (1-6)
4-6	Below average to average quality	
7	Good quality construction	Medium (7-9)
8	Very good quality	
9-10	High-quality / custom construction	High (10 -13)
11+	Luxury / exceptional homes	

Buyer :

Always benchmark the price against the grade's range

If a seller lists:

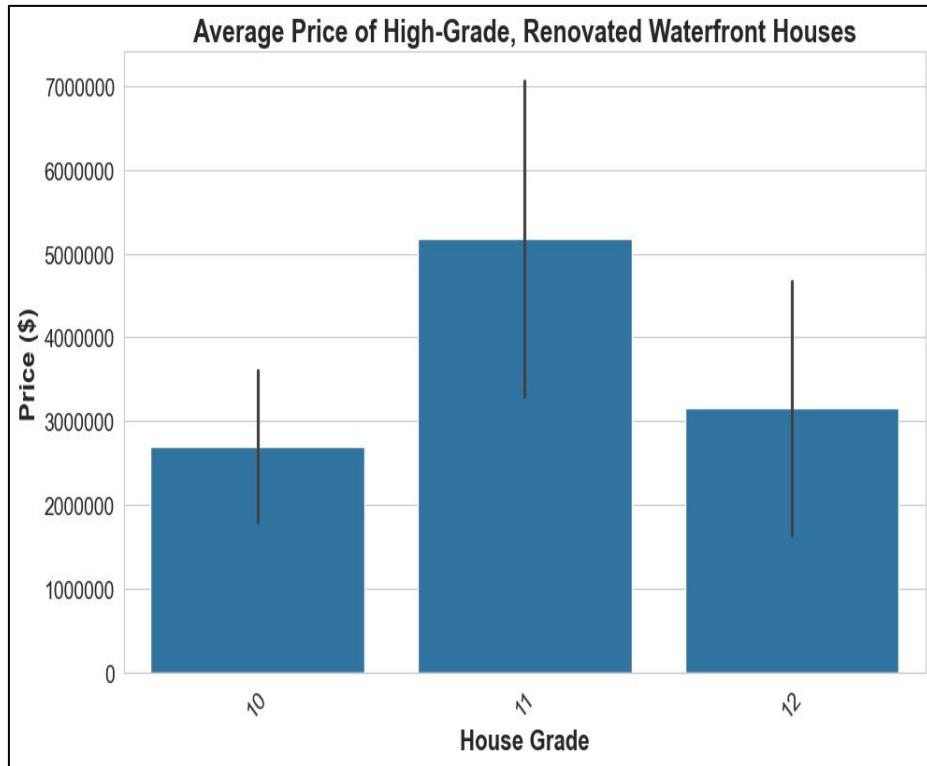
- A Grade 10 home at Grade 11 prices → negotiate
- A Grade 12 home at the lower end → potential deal

Seller : Grade 11 sellers are in the strongest position

Have less price uncertainty, attract serious luxury buyers.

Grade 10 sellers should avoid overpricing

Buyers know Grade 10 has a wide price range.



Key takeaway : Anything between \$2.5M to \$4M is good deal.

Buyer : Target the quiet months

Months with no activity (1, 2, 4, 5, 7, 8, 9, 10) are ideal for buyers who want leverage.

Use seasonality to your advantage

Luxury waterfront buyers often shop when the weather is nicer or during year-end financial planning.

Seller :

Price confidently in active months :

Because buyers are already active in months 3, 6, 11, and 12.

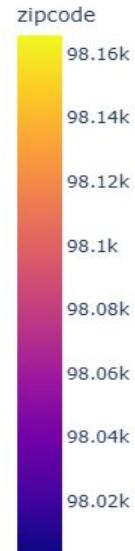
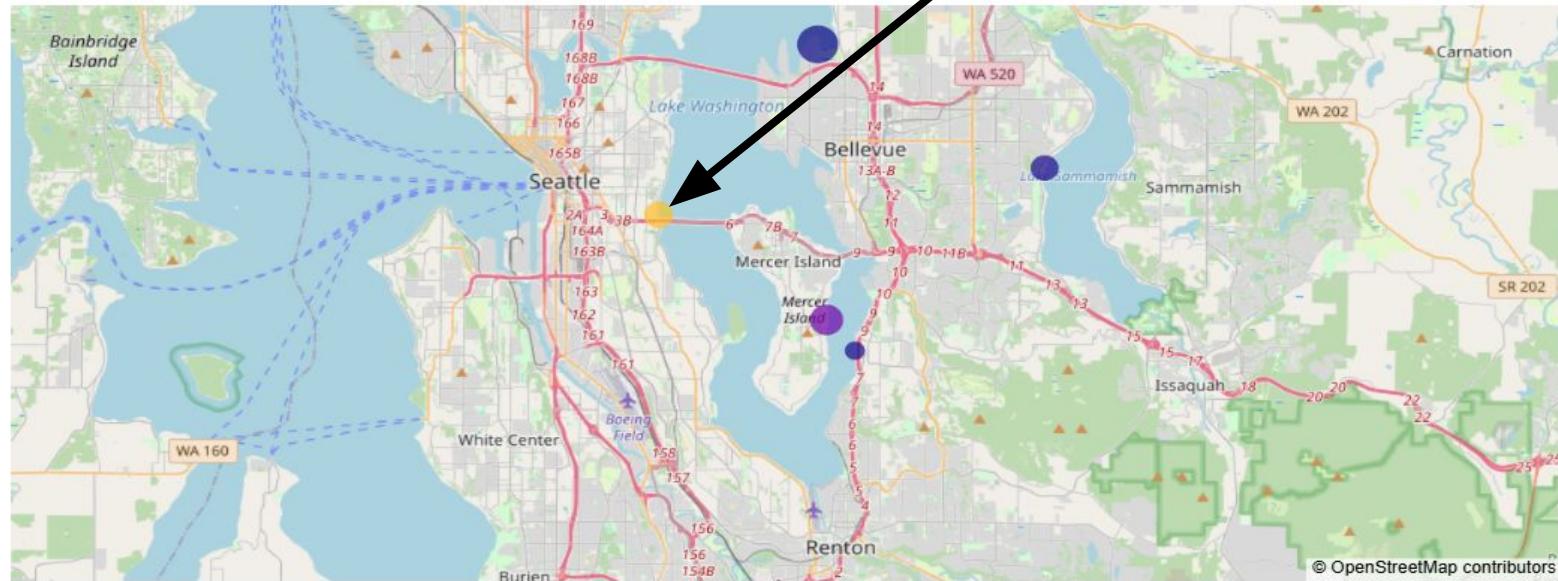
Prepare the property early : If you want to list in Month 3 or 6, start renovations or touch-ups in winter.



Based on demand and negotiation home with zipcode 98144, price \$3,6M, renovated in 2002 with grade 10 is to bet.

Renovated Waterfront Houses with High Grade by Zipcode

98144
price=3600000
lat=47.5925
long=-122.287
grade=10
yr_renovated=2002
zipcode=98144





Takeaways

- Grade matters — but not in a straight line.
- Renovation and luxury features amplify price volatility.
- Location and Seasonality are extremely strong factors.