

EDA King County Housing

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Client: Timothy Stevens

- seller
- owns expensive houses in the center
- needs to get rid of
- looks for best timing
- limit: within a year
- open for renovation under condition that profits rise





Where is King County?

King County



KING COUNTY

- total area of 2,307 square miles (5,980 km²), of which 2,116 square miles (5,480 km²) is land and 191 square miles (490 km²) (8.3%) is water
- 760 lakes and 3,000 miles (4,800 km) of streams and rivers
- about two-thirds of King County's population live in Seattle suburbs

3 Guiding Hypotheses

1. What is the best time of the year to sell for expensive houses in the center?

HYPOTHESIS: For expensive houses in the center, mean price/sqft (>5%) is higher in the summer months of the year (May-September).

2. Would renovating result in higher profits for the client?

HYPOTHESIS: For expensive houses in the center, renovation allows for a significant (>15% increase) in price/sqft.

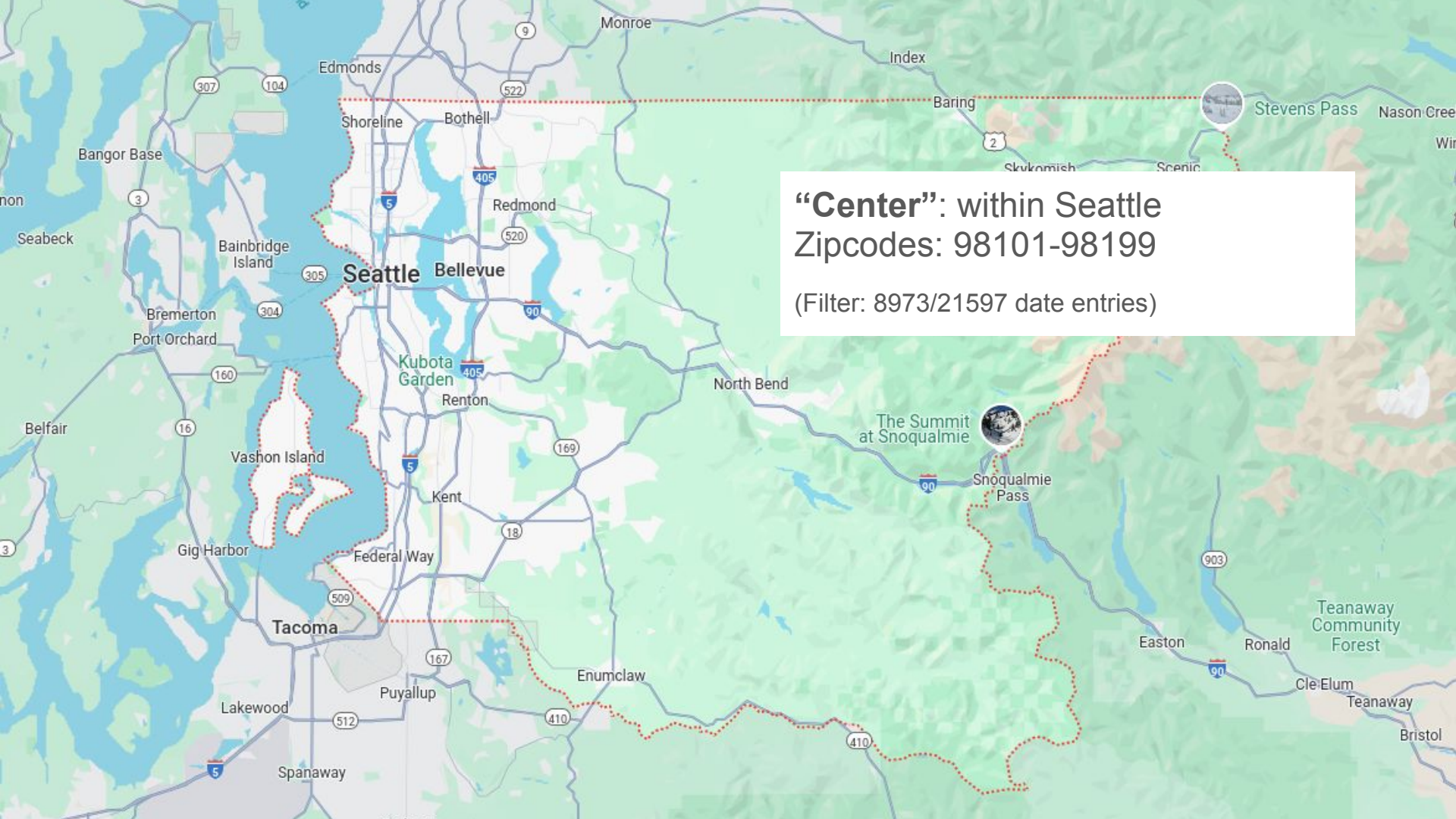
3. How exactly do renovations matter for houses in the centre?

HYPOTHESIS: Renovation only matters significantly (15%) for houses with lower condition & grade, for historical houses, and for houses with a waterfront or great view.

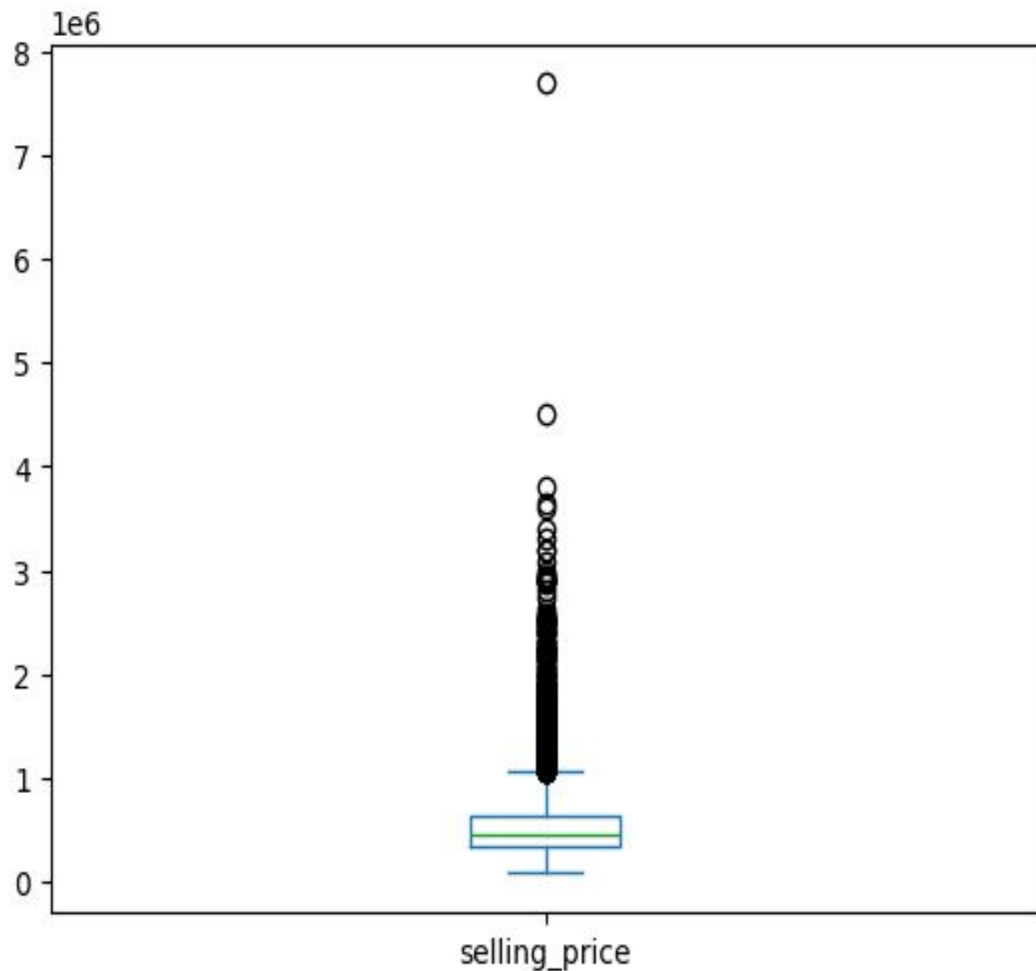
The Data Set

- King County Data Set on Sales of Houses
- 21597 entries, 21 features
- Time span: May 2014 until May 2015
- Location
 - Zipcodes 98001-98199
 - Latitude 47.1559-47.7776; Longitude -122.519-(-121.315)
- Features:
 - bedrooms, bathrooms, sqft_living, sqft_lot, floors, waterfront, view, condition, grade, sqft_above, sqft_basement, yr_built, yr_renovated, zipcode, lat, long, sqft_living15, sqft_lot15, selling_date, selling_price

Definitions



“Center”: within Seattle
Zipcodes: 98101-98199
(Filter: 8973/21597 date entries)



“**expensive**”: Q3 (third quartile)
i.e. from \$ **630,000**

(Filter: 2255/8973 data entries)

min	78,000
25%	337,000
50%	453,000
75%	630,000
max	7,700,000

Research Question 1

What is the best time of the year to sell?

HYPOTHESIS: For expensive houses in the center, avg price/sqft ($>5\%$) is higher in the summer months of the year (May-September).



Pearson corr: 0.68



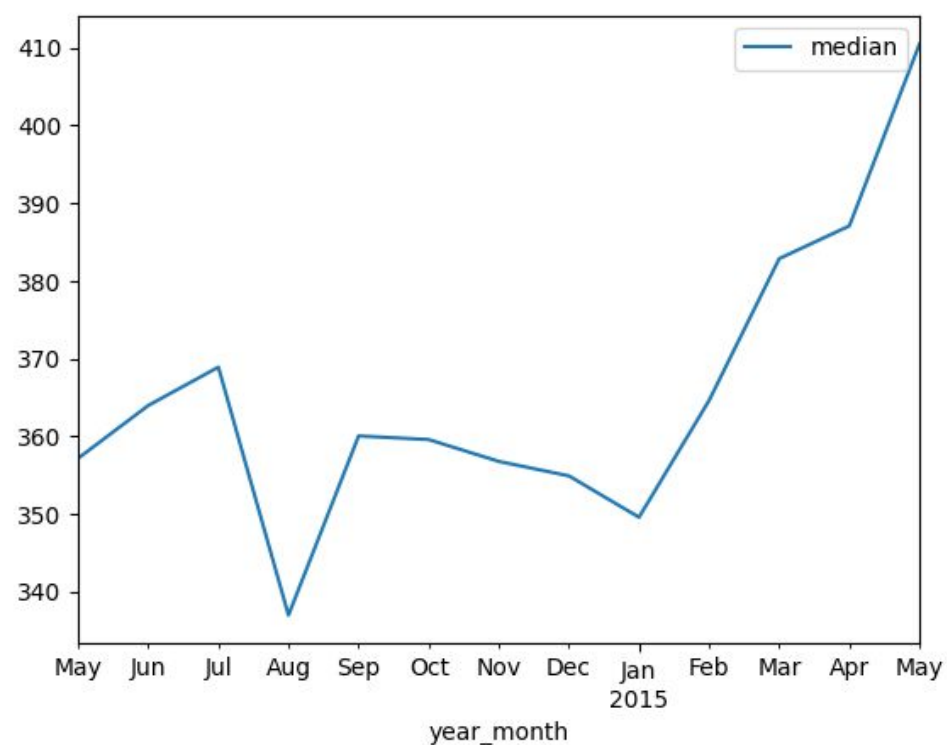
Pearson corr: 0.30

RESULT 1a: HYPOTHESIS 1 == FALSE

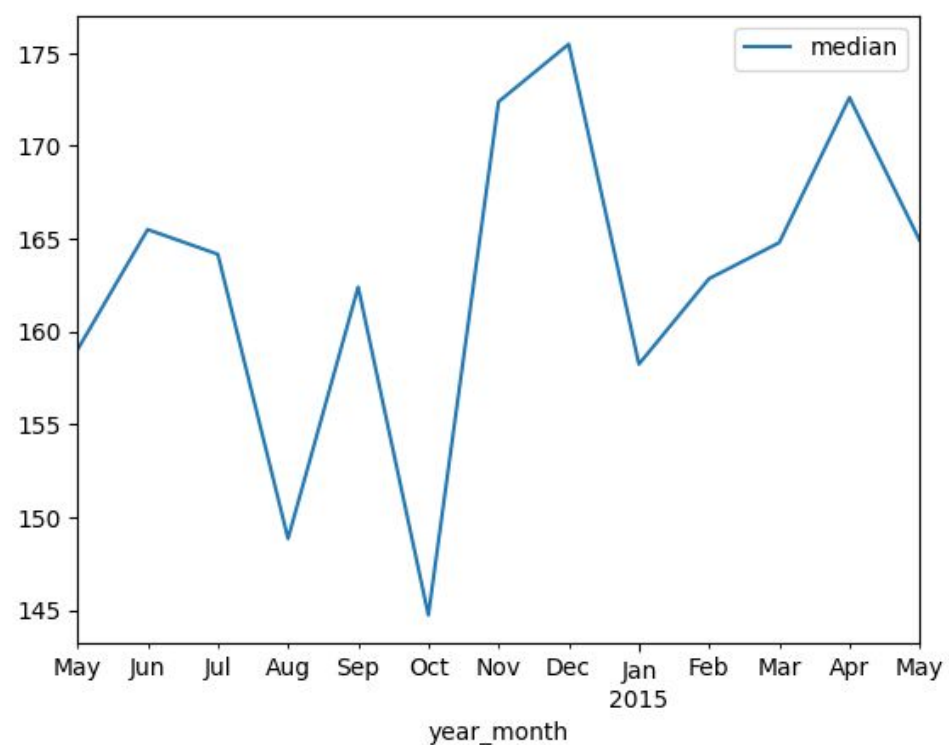
profit in summer months < winter months

- Overall price/sqft_living
 - mean: 380
 - median: 365
- Summer price/sqft_living
 - mean 377
 - median 360
- Rest of the year price/sqft_living
 - mean 384
 - median 371

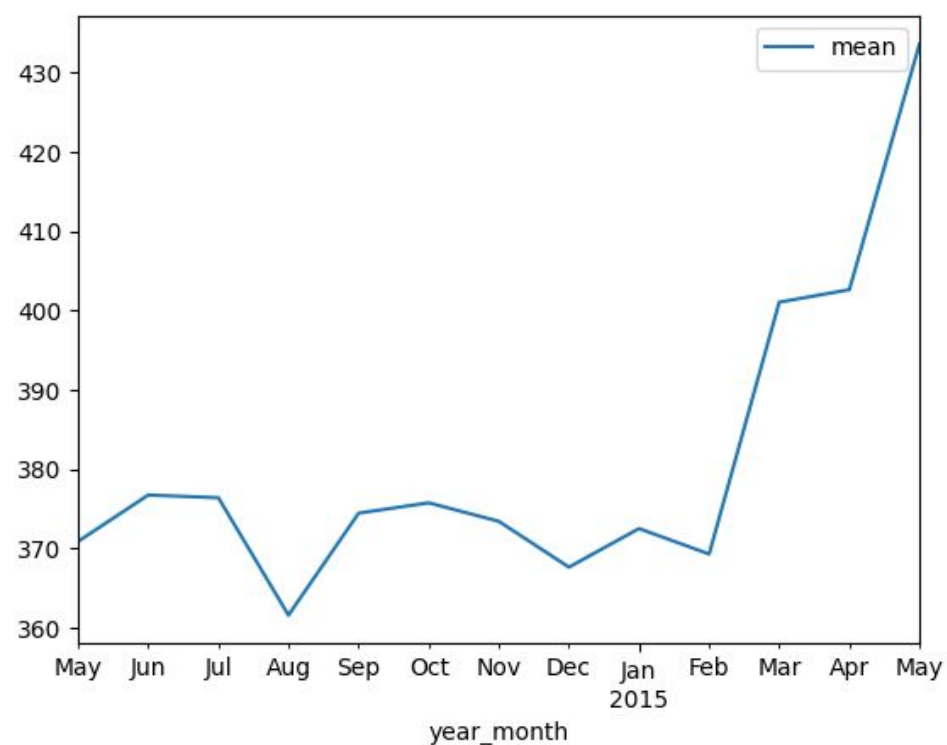
RESULT 1b: Specific months are better than average!



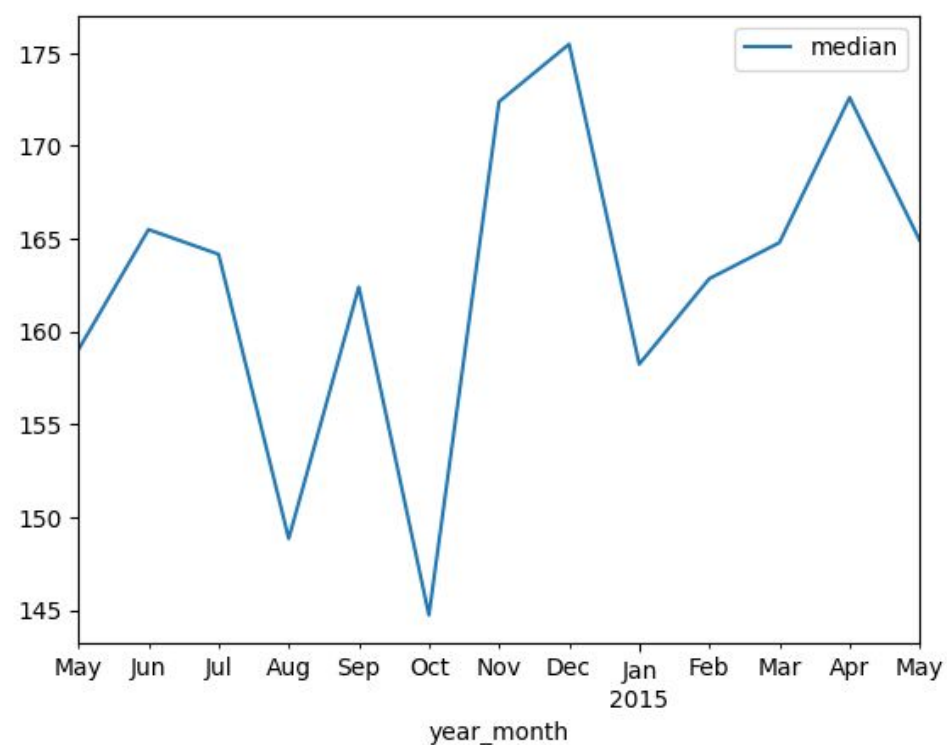
development of price per sqft_living (median), over the months



development of price per sqft_lot (median), over the months



development of price per sqft_living (mean), over the months



development of price per sqft_lot (mean), over the months

RESULT 1b: Specific months are better than average!

- **May, April, March 2015 decreasingly perform best**
- Overall price/sqft_living
 - mean: 380
 - median: 365
- May 2015
 - mean: 434; median: 410
- April 2015
 - mean: 403; median: 387
- March 2015
 - mean: 401; median: 383

Overall timing recommendations based on data

- Sell in March, April, May
- Fluctuations indeed 15%:
 - For median, the highest month gives 121% profit increase compared to the lowest month
 - For mean, the highest month gives 119.9% profit of the lowest month
- Caveats:
 - Confidence: small, since existing data set only represents 1 year, 9 years ago
 - In particular: May 2014 performs much worse than May 2015 (mean: 371; median: 357)
 - There could be a reason specific to Spring 2015 that let the house prices rise

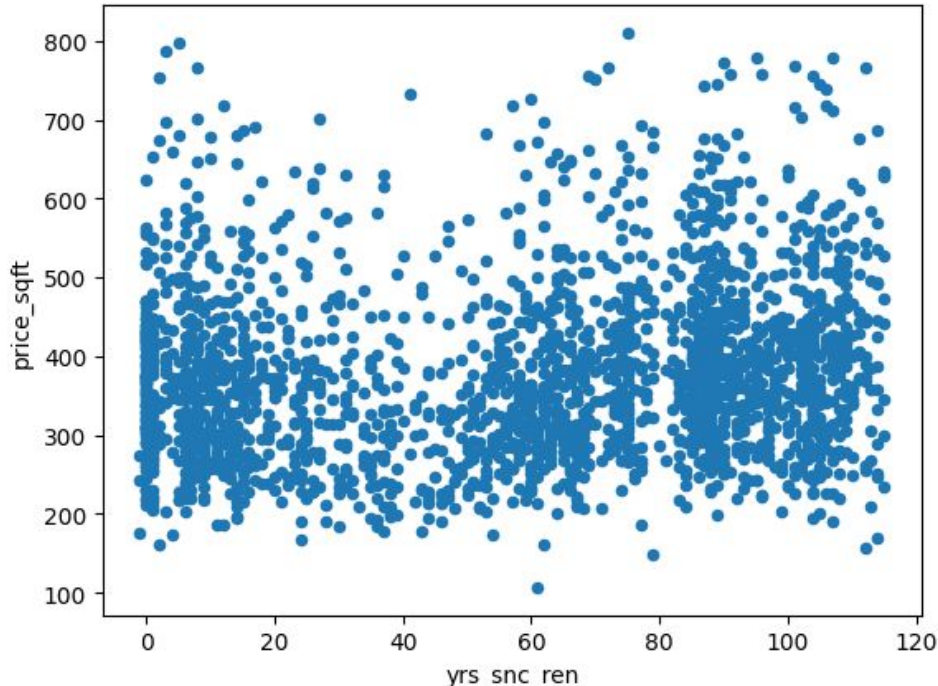
Research Question 2

Would renovating result in higher profits for the client?

HYPOTHESIS: For expensive houses in the center, renovation allows for a significant (>15% increase) in price/sqft.

Preliminary RESULT 2: HYPOTHESIS 2 == FALSE

Renovations so far do show little correlation with price/sqft



Pearson corr: 0.145

Research Question 3

How exactly do renovations matter for houses in the centre?

HYPOTHESIS: Renovation only matters significantly (15%) for houses with lower condition & grade, for historical houses, and for houses with a waterfront or great view.

Preliminary Result 3: data didn't allow for conclusions yet, further investigations possible, if desired

Recommendations on Renovations

- Renovation might not be worth it
- Spring is incoming, renovations might take longer than 4-6 months
- Since client is time-bound, recommendation against renovation

Confidence: small

- *existing data set only represents sales of 1 year, 9 years ago*
 - *renovations might not have been recorded, since there are many houses where even for 50 to 120 years of age no renovation is recorded*
 - *May in particular shows large difference between the years*
-
- Further analysis for specific houses can be performed, if desires

Thank you!