



PROJEKT

# FAMILY HOUSE IN KING COUNTY, WASHINGTON (USA)

DATA SCIENCE CONSULTING - MATTHIAS HERRMANN

DATUM

06-NOV-2022

CLIENT

CUSTOMER THOMAS HANSEN & FAMILY

# Introduction

## Who I am?

- Data Science Consultant, supporting customers to make the right decisions (Matthias Herrmann, settled in Northern Germany)

## Customer information & requirements:

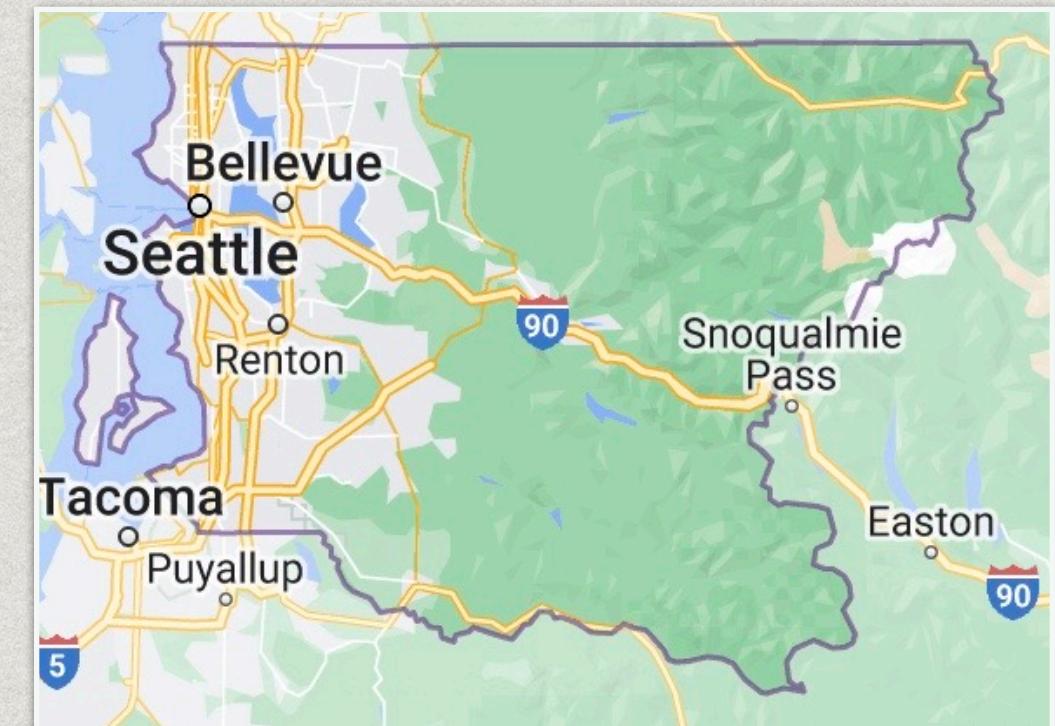
- Family father Thomas Hansen (5 kids) and low budget wants to buy a house in Seattle area (King County, Washington, USA)
- Looking for a house in a nice, social neighbourhood within a safe and family friendly area.



King County, Washington, USA

## Goal of the analysis:

- provide a good understanding of the general housing condition in Seattle and surroundings
- provide recommendations for the stakeholder e.g. where and when to buy a house.

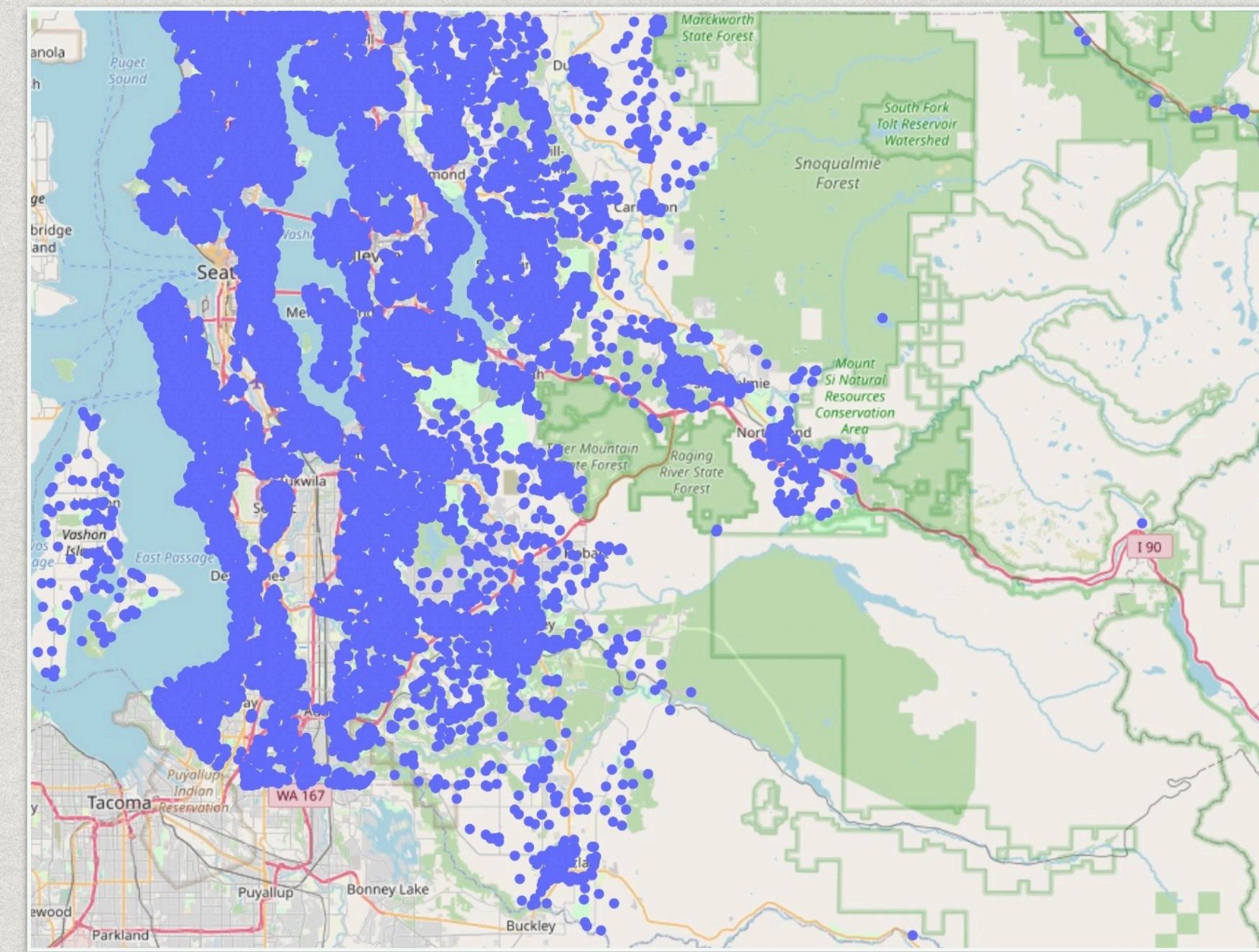


# Data overview

## Which data is used for the analysis?

- „King County House prices“ dataset provided by Neuefische
- Time period: 02/May/2014 - 27/May/2015
- Storage: saved locally, CSV file, 2.5MB
- Content: 21420 houses

On the map of Kings County you see the houses sold between May 2014 and May 2015 highlighted in blue



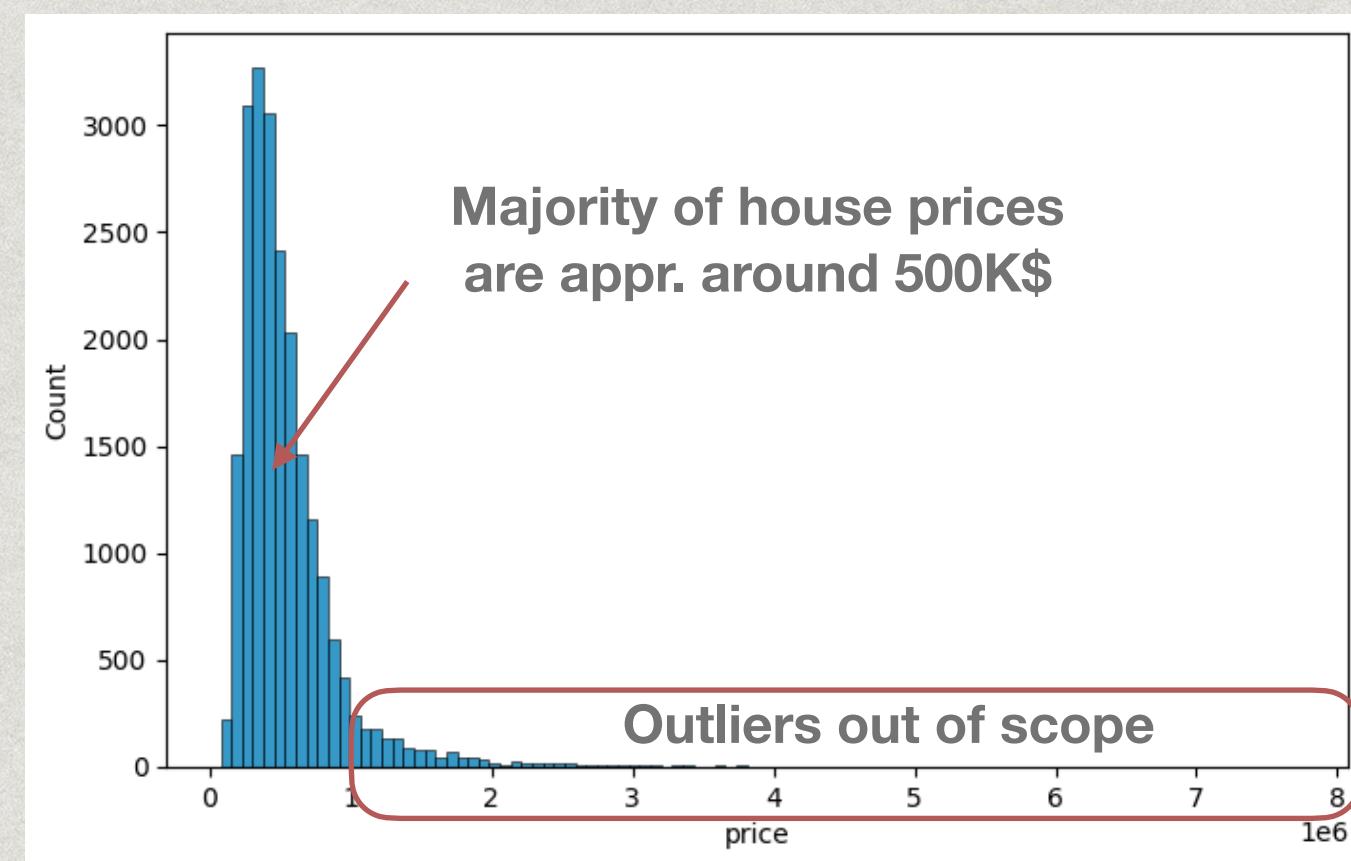
# Main hypotheses

1. „If you choose the right time you will get a good house for less money“
2. „If the the number of rooms increase, the size and the price will increase as well“
3. „If a house is in good condition the price will be higher“



# Insight of the data

## House price distribution



- The price distribution shows that the majority of house prices are approximately about half a million dollars.
- A minority of houses are above 1 M\$ up to 8M\$. But they are not relevant for this analysis since they are much too expensive for our scope.

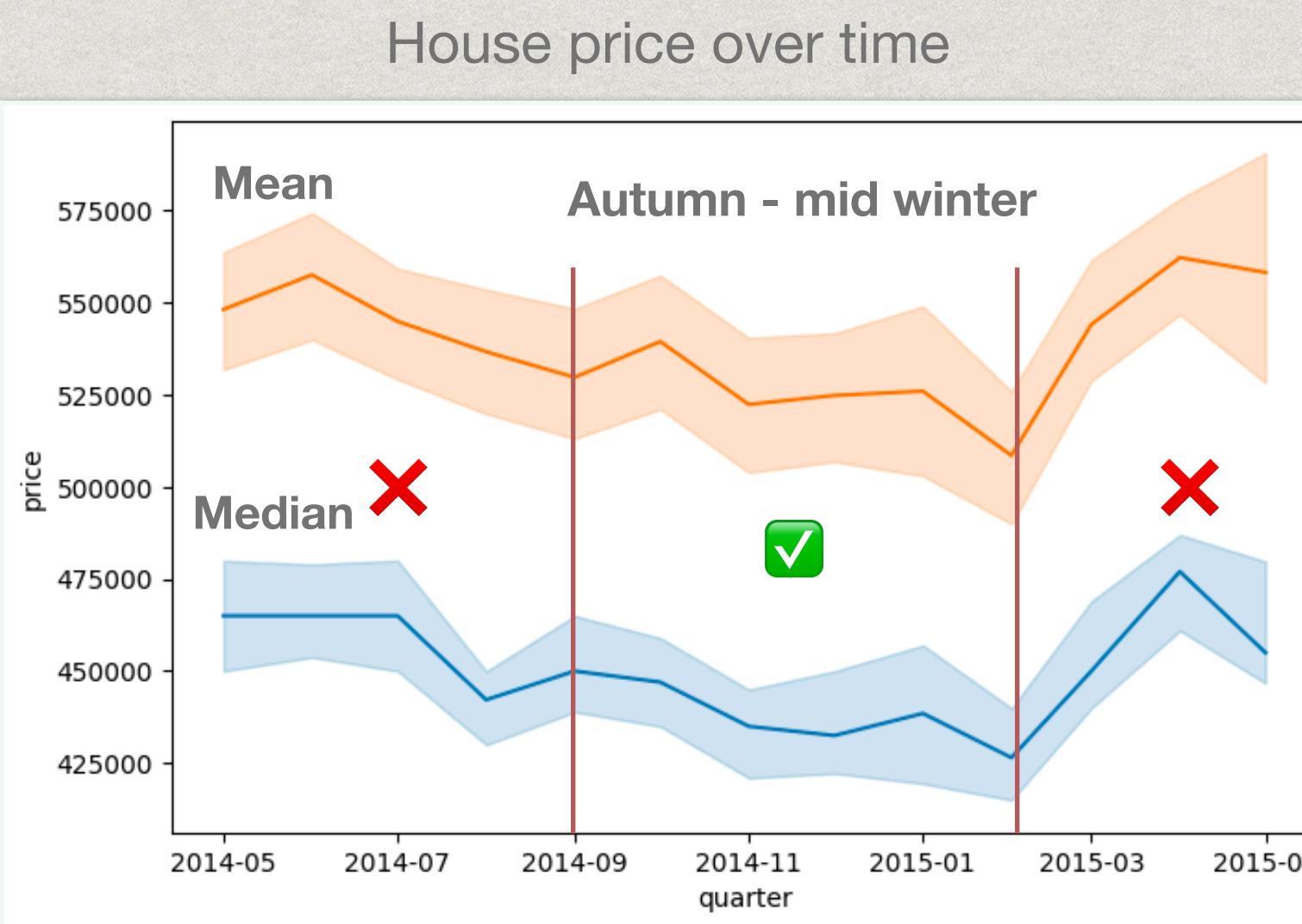
## Overview about the house prices

KPI	Check	Comment	Apply?
Min	78.000 \$		
Mean	540.297 \$	Not robust against outliers	✗
Median	450.000 \$	Is robust against outliers	✓
Max	7.700.000 \$	Villas are out of scope since its far away from customer's budget	

For further analysis we use the median as statistic key value instead of the mean since the median is more robust against outliers (houses above 1M\$)

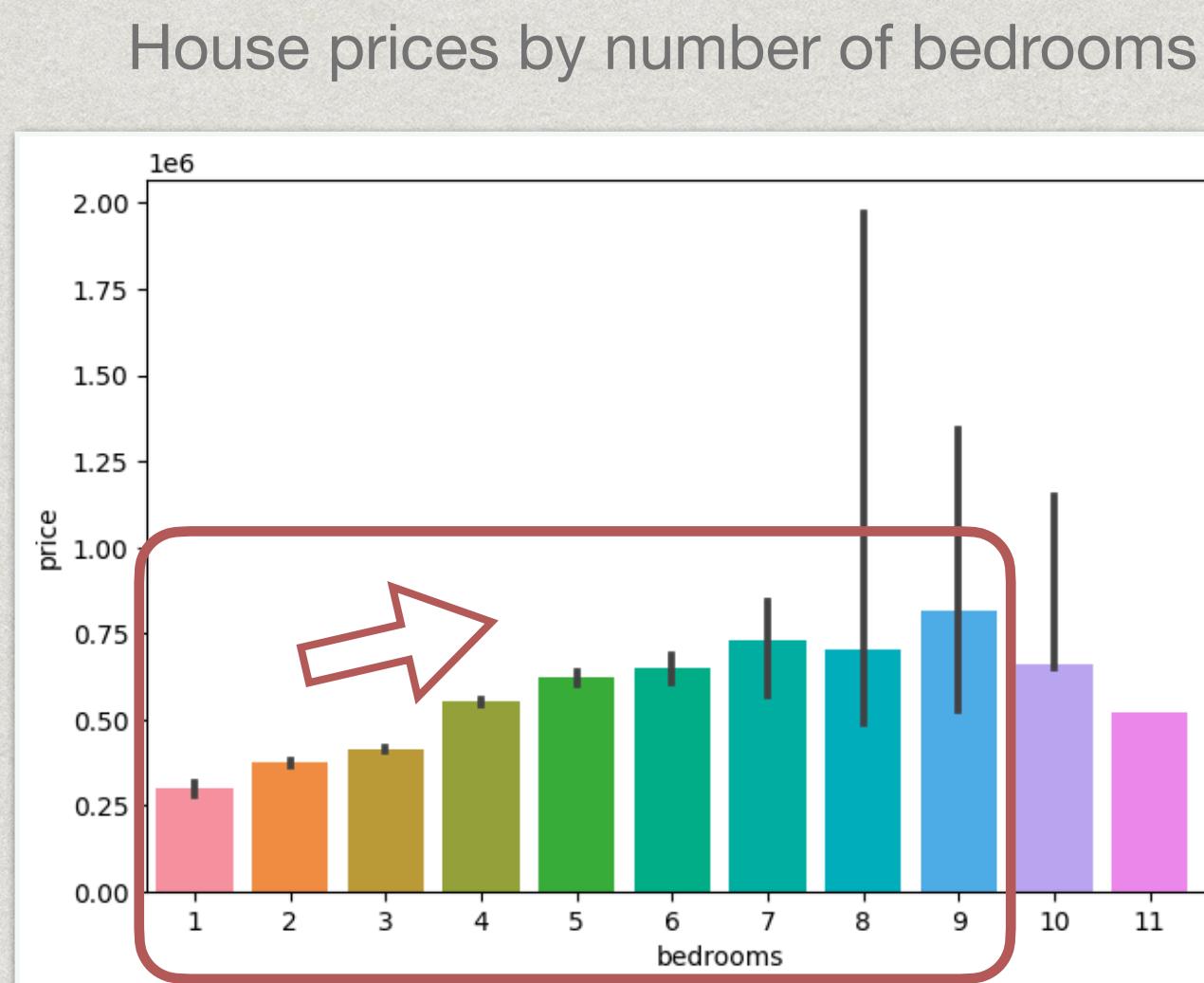
# Insight of the data & Analysis results

## When is a timing to buy a house?



The data shows that the best time to buy a house is between beginning of autumn until mid winter (send September - end February)

## Which kind of house would fit for you?



\*Median was used instead of mean value to be outlier robust

- The data shows that the price of a house increase by the number of bedrooms. We discard houses with more than 9 bedrooms since there is a downward trend in the price which would need to be investigated if they would be in scope.

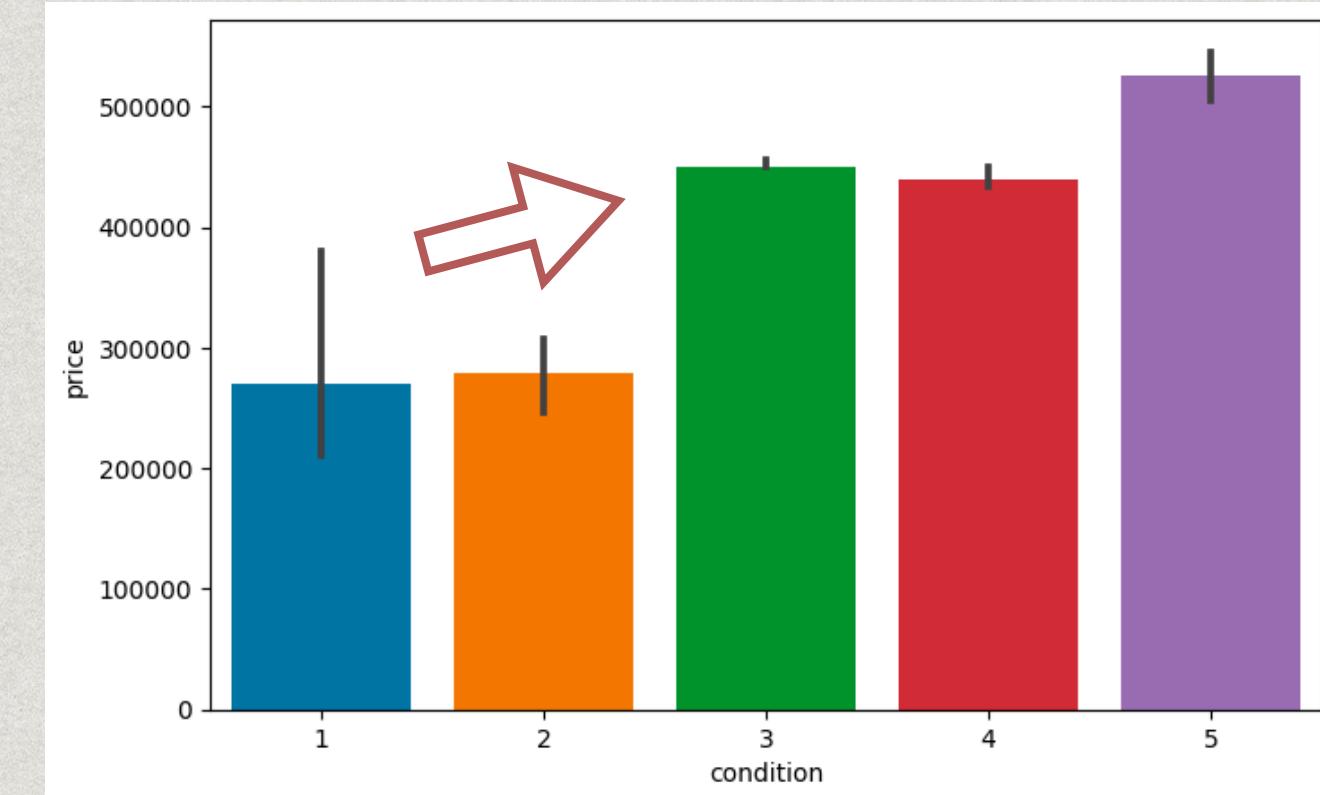
# Insight of the data & Analysis results

## Does the condition of the house effects the price?

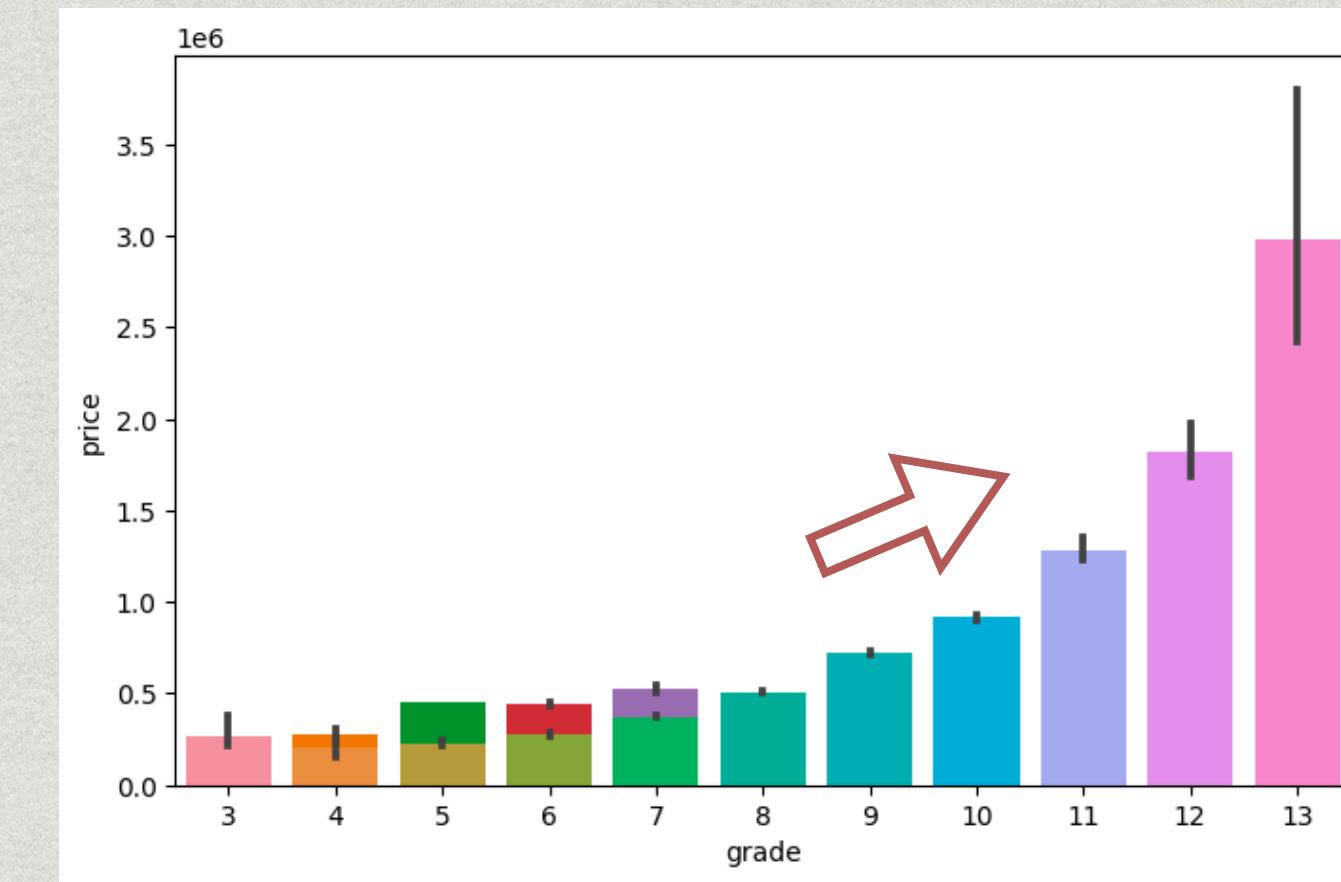
- The price increase with the condition of the house.
- The grade based on King County grading system have been taken as the main indicator. Further the „condition“ information from the dataset was used to secure the result.



House price by condition



House price by grade



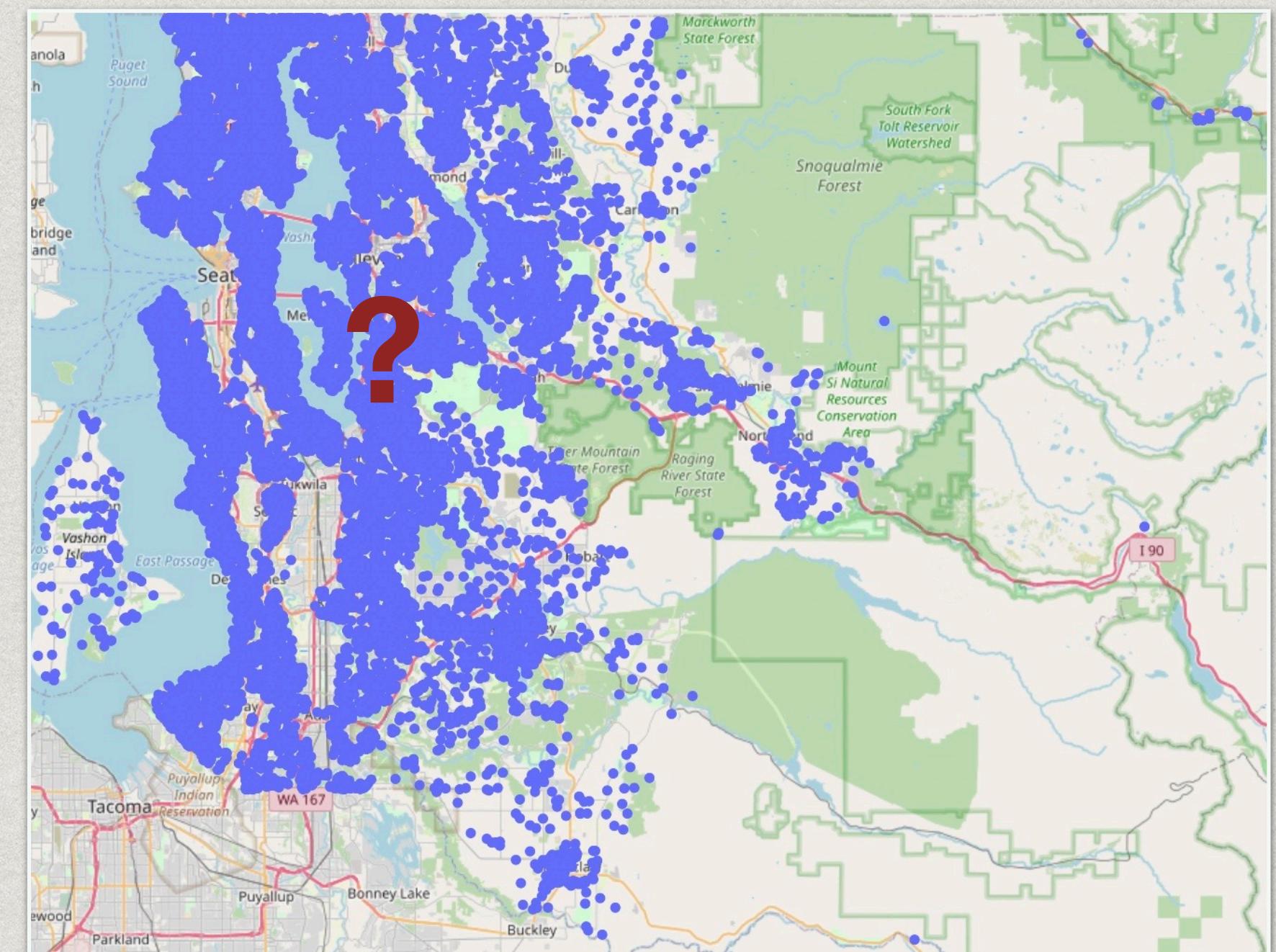
\*grade = based on King County grading system , condition= how good the overall condition is

# Challenge to find the right location

## Where is a good location to find a house for a family?

- As you can see on the map there are plenty of possibilities to find a house in Seattle area. But which area is the best to live with a family which fits your needs?
- Needs of customers: Thomas Hansen (5 kids)
  - Big house with many bedrooms and a garden
  - social neighbourhood within a safe and family friendly area
  - Seattle area near parks, playgrounds, kindergarten, school, activities for kids
- Constraints:
  - Low budget but due to support from their parents the customer was able to increase his budget in last minute. Now he is able to buy a house in the price range of 500-700 K\$.

## House price by location

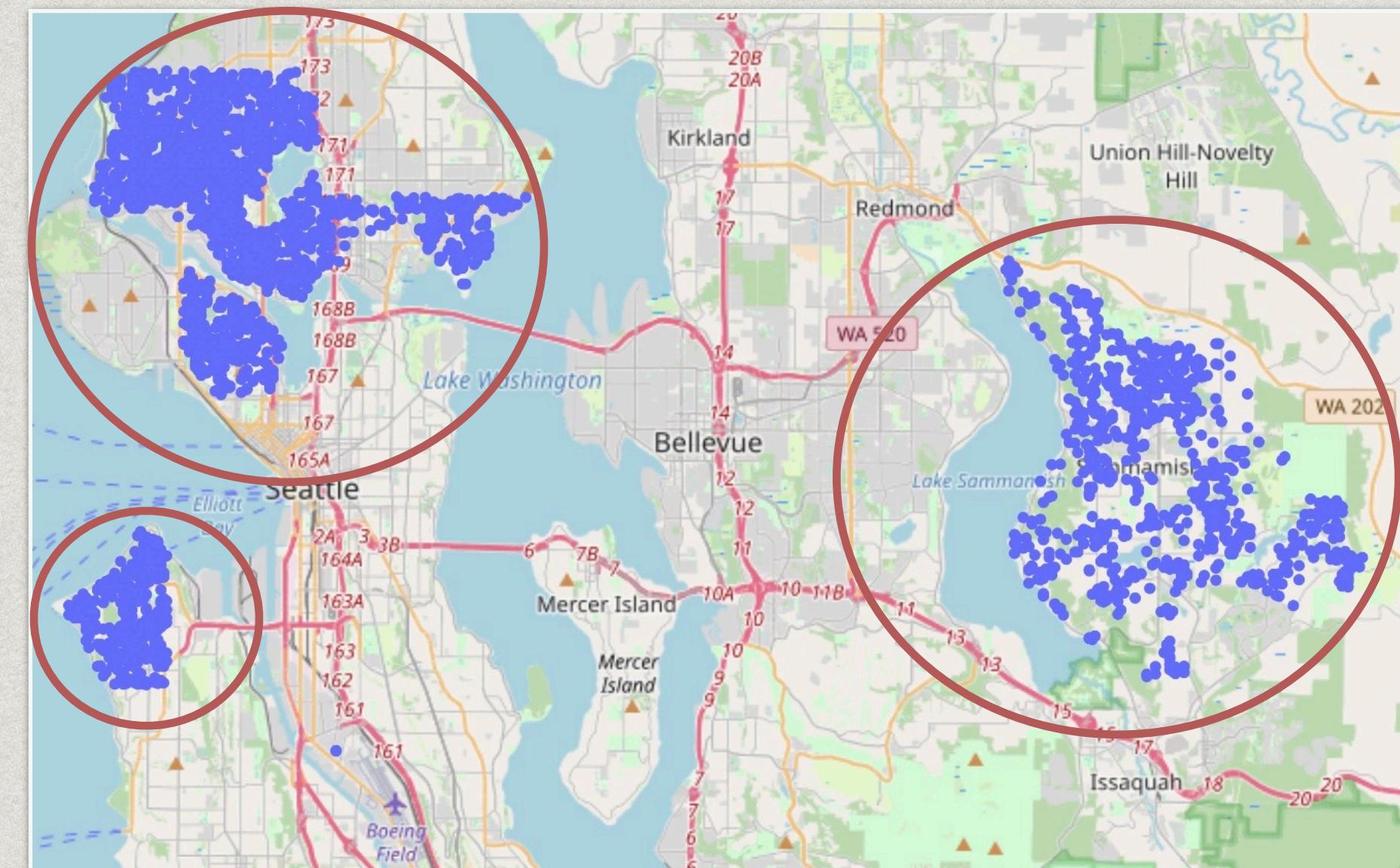


# Recommendation for the customer

## Where is a good location to find a house for a family?

- In order to get a good understanding which areas are good for families, a „Seattle moving guide for family friendly neighbourhood“ was used for deeper analysis.
- The guide answer the following questions:
  - Where are the best school districts in Seattle?
  - Where are the safest neighbourhoods in Seattle?
  - Where are things to do in Seattle for kids?
  - Do I want other families close by?
- There are many great places for families in Seattle but there are a few that consistently rise to the top of the list.
  - Greenwood, Queen Anne, Lower Queen Anne, Ballard, Laurelhurst West Seattle, Wallingford, Sammamish

## Good house locations for families



\* reference: <https://www.pods.com/blog/2019/10/seattle-moving-guide-family-friendly-neighborhoods-in-seattle/>

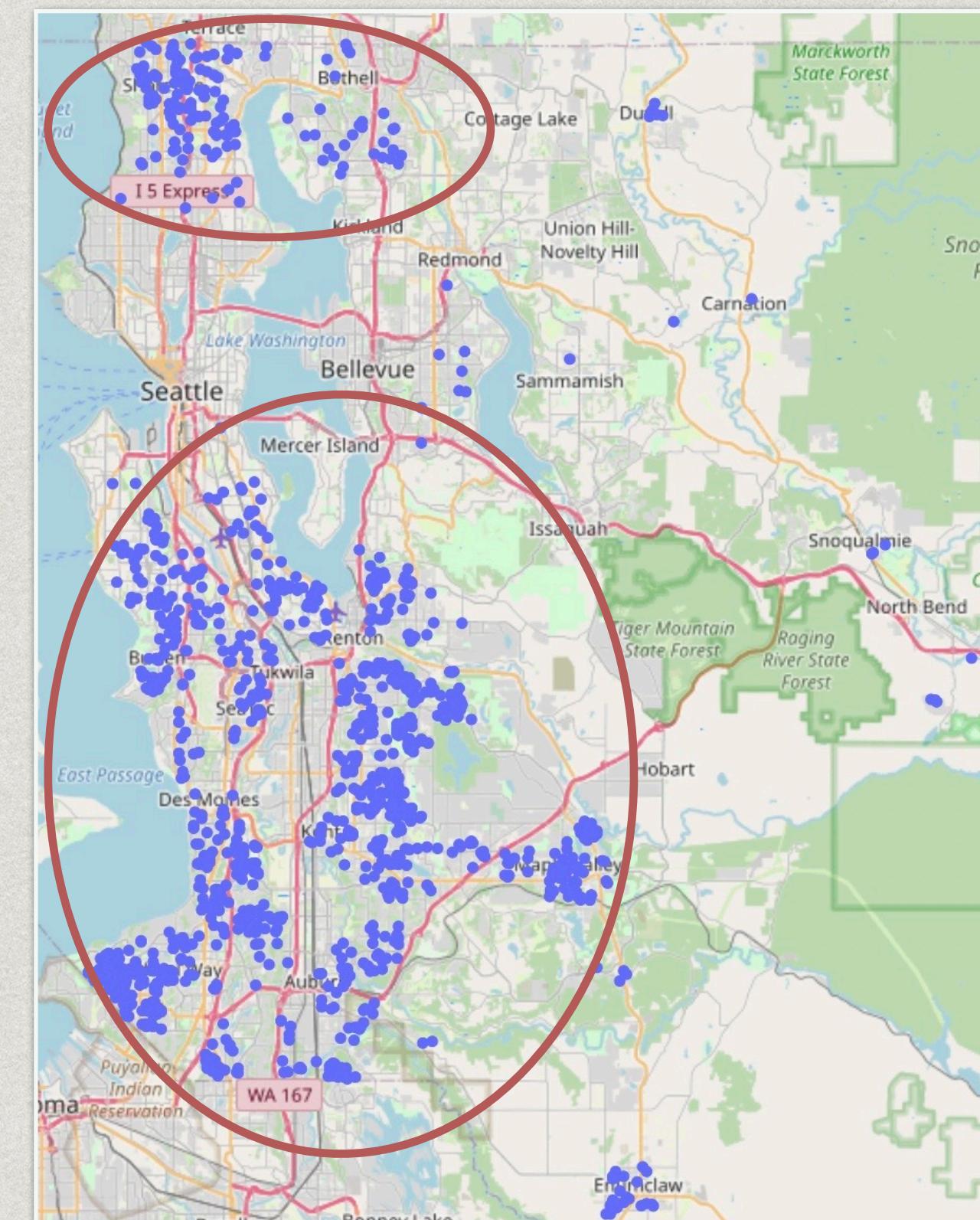
As you can see in the map there are 3 hotspots for family-friendly living areas in Seattle environment.

# Recommendation for the customer

## Where are the houses which are in the budget?

- The analysis with following parameters show some locations in family-friendly areas and which could fit the needs of the customer.
- 2 main areas are shown in the map. There are some other locations in suburbs which also fit the needs of the customer.
- Characteristics of the house for a search algorithm:
  - bedrooms up to 8 bedrooms
  - price between 400 K\$ and 700K\$
  - Lot up to 9.000 sqft
  - Living area between 1.500 and 3.000 sqft

## Houses within the budget



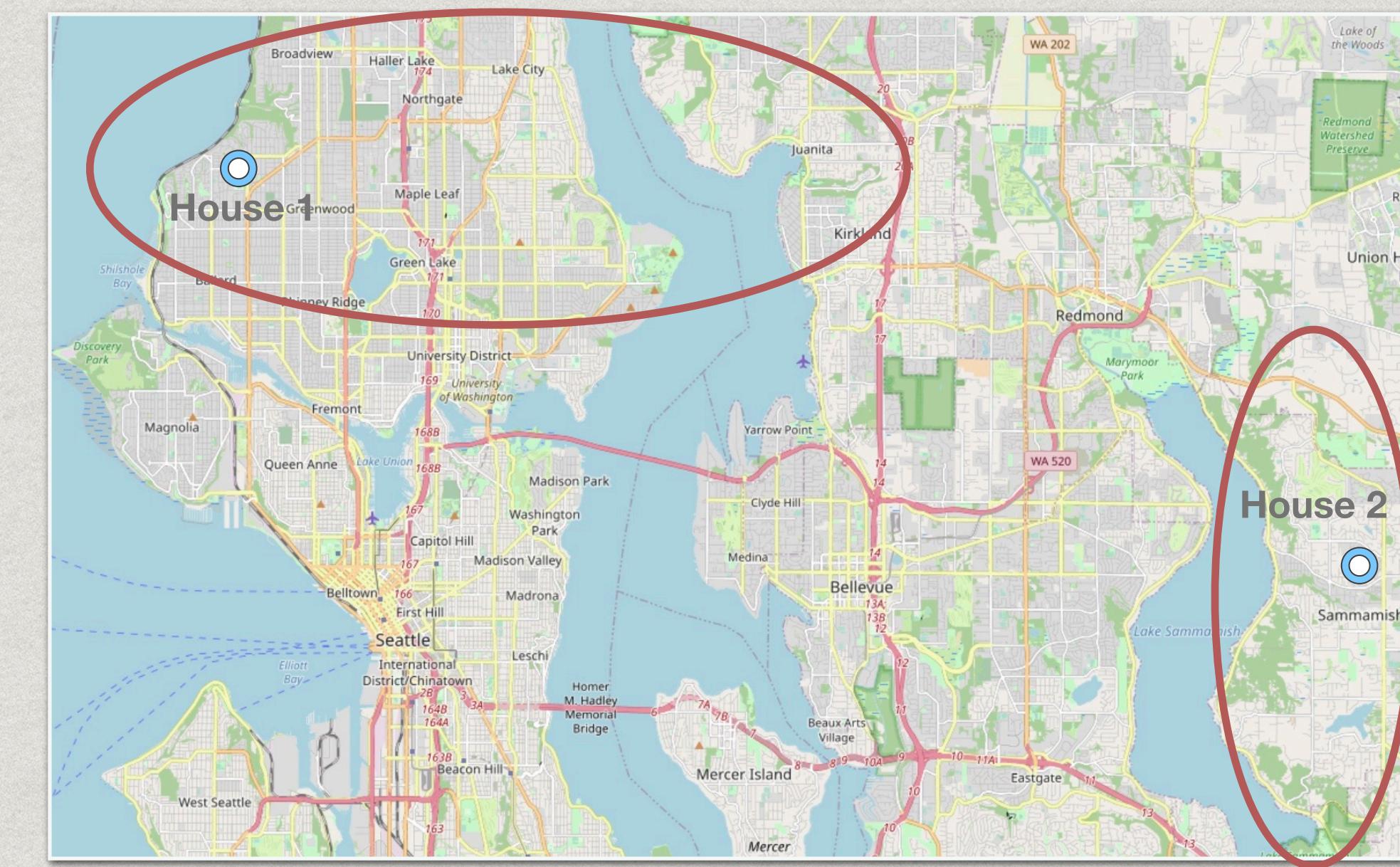
# Recommendation for the customer

Now we bring all together a house within the budget and in a family friendly location

- We get 2 results which we can use as example. The houses are in one of the recommend areas for families (Ballard and Sammamish) and in the budget of 500-700K\$ + meet the wishes as listed in the slide before (bedrooms, big house and lot,...)
- House number 1 is cheap and old etc. and house 2 seems to be a very good catch.
- Conclusion: Keep on going looking for a house in recommended areas and one day there will be the right offer.

Criteria	House 1	House 2
District	Ballard	Sammamish
Price	350K\$	580K\$
Grade	7	8
Renovated?	No	21-May-13-Nov 2014
Built year	1951	1988
Bed rooms	3	3
Floors	1	2
Lot/Living (sqft)	8010/1680	7484/2150

Specific house search with in a family friendly environment



# Conclusion & recommendations

## Main hypotheses

1. „If you choose the right time you will get a good house for less money“
2. „If the number of rooms increase, the size and the price will increase as well“
3. „If a house is in good condition the price will be higher“

## Recommendations for the customer

When should you buy?

- the best time to buy a house is between beginning of autumn until mid winter (send September - end February)

What are the characteristics of a house which could increase the price?

- Buy a house with less rooms as you need and split the bigger rooms by yourself in order to have enough sleeping rooms

Where is a good location to find a house for a family?

- Greenwood, Queen Anne, Lower Queen Anne, Ballard, Laurelhurst West Seattle, Wallingford, Sammamish

How much money do you need to spend for a house which fits your needs?

- Between 500K\$ and 700K\$

Thanks for your attention!