

Exploring the Housing Market Through Data Science with EDA

Welcome to our presentation on data analysis for the housing market. We'll be taking a deep dive into the data to find insights that can help buyers, sellers, and investors make informed decisions.

 **by Nikita Wilms**



About the Dataset

Data Source

The data for this project was sourced from King County Data Website. It comprises comprehensive information about properties in King County Washington from 2014-2015, including attributes like sale price, bedrooms, bathrooms, square footage, condition, grade, and more.

Data Size

The dataset consists of 21597 rows and 21 columns. Each row represents a unique property transaction record, while each column provides specific information about the properties, such as their features, sale dates, locations, and prices.

Missing Data

During the EDA process, we identified missing data in various columns. We implemented strategies to handle these missing values. By addressing missing data appropriately, we ensured that our analysis provides accurate insights.

About the Client



Investor: Charles Christensen

Our client is a real estate investor is interested identifyproperties with significant investment potential, explore the renovation impact on returns, pinpoint high-return neighborhoods, and analyze optimal timing for real estate investments.

Quality of the Data

1 Reliability

The dataset is sourced from King County database, a reliable and widely used data provider in the real estate industry.

2 Completeness

While some data may be missing or incomplete, we will take steps to clean and verify the data for accuracy.

3 Relevance

The data is relevant to those looking to buy, sell, or invest in real estate and is rich with insights for making informed decisions.

The Hows

Data Cleaning

We'll use Python and Pandas to clean and organize the data for analysis.

Data Visualization

We'll use matplotlib and seaborn to create visualizations that help tell the story of the data.

Data Exploration

We'll check hypothesis about the market and see if they are true or not. Based on that we will develop a strategy.

Questions to Be Answered

1

Want to know where your investment will pay off? Check out the neighborhoods with the biggest ROI!

We'll uncover the neighborhoods with the highest ROI and explore a strategy to find undervalued houses.

2

What is the ideal time to buy or sell a home?

We'll examine trends in the housing market to determine the best time for buyers and sellers to make a move.

3

What factors affect home prices?

We'll identify the key factors that affect home prices and explore how they impact the housing market.

Want to know where your investment will pay off? Check out the neighborhoods with the biggest ROI!

up to \$250,000 are
shown in **red**.

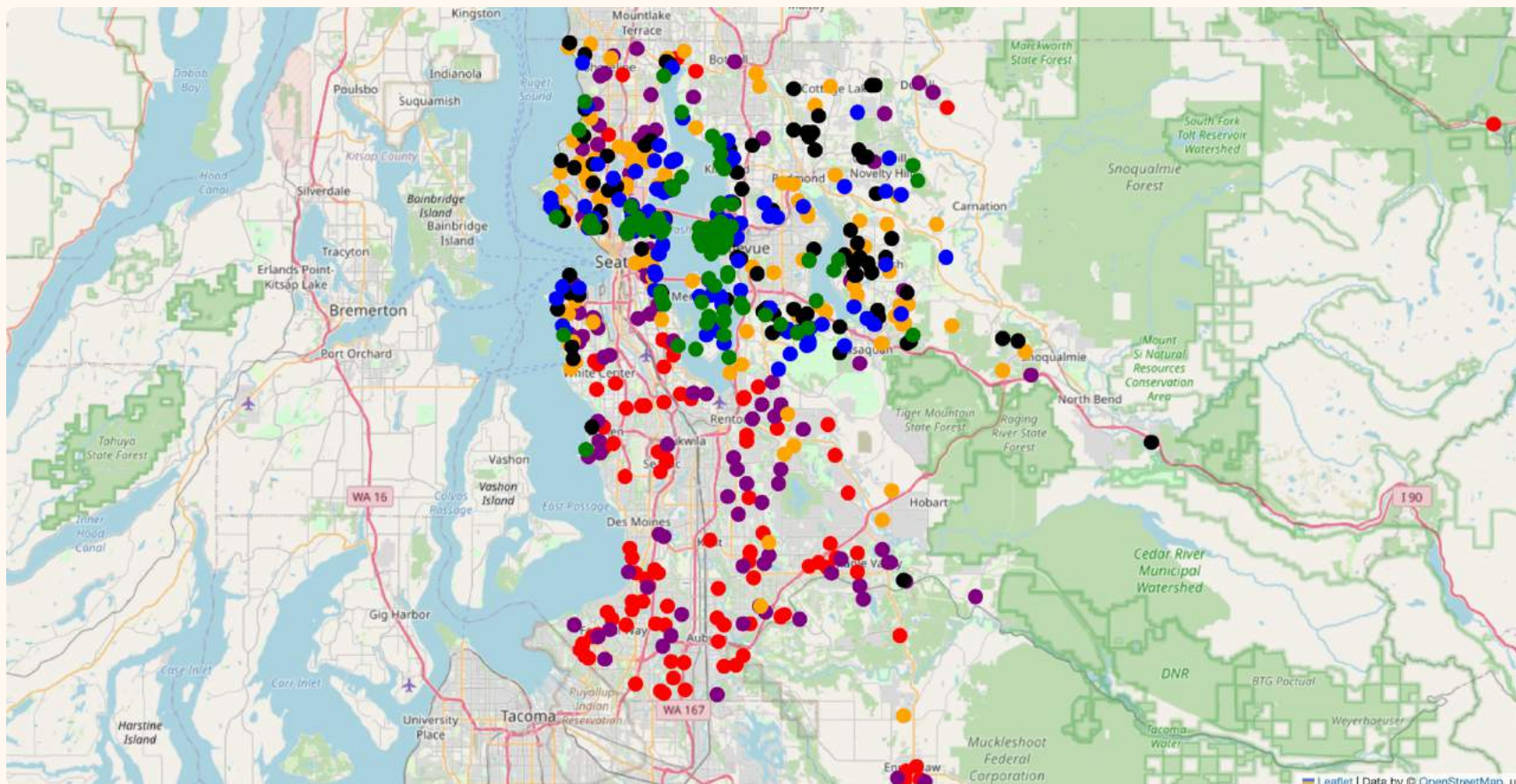
up to \$500,000 are
shown in **light red**.

up to \$750,000 are
shown in **orange**.

up to \$1 million are
shown in **black**.

up to \$2 million are
shown in **blue**.

more than \$2 million
are shown in **green**.



The Process of finding undervalued houses

- Find the neighborhoods with the highest ROI
 - price range is negative to 320%
 - average ROI is 53.5%
 - **average price is around 340.000 USD**
- Give us only the neighborhoods with at least 25% ROI
- Pick the features from the best performing houses in the > 25 % ROI neighborhoods , which are already sold
 - 3 bedrooms, 2 bathrooms, sqfr living >, 1555, condition >=3, grade >= 6, **price < 340.000**
- Look for houses with these features, which are for sale. Inside > 25 % ROI neighborhoods

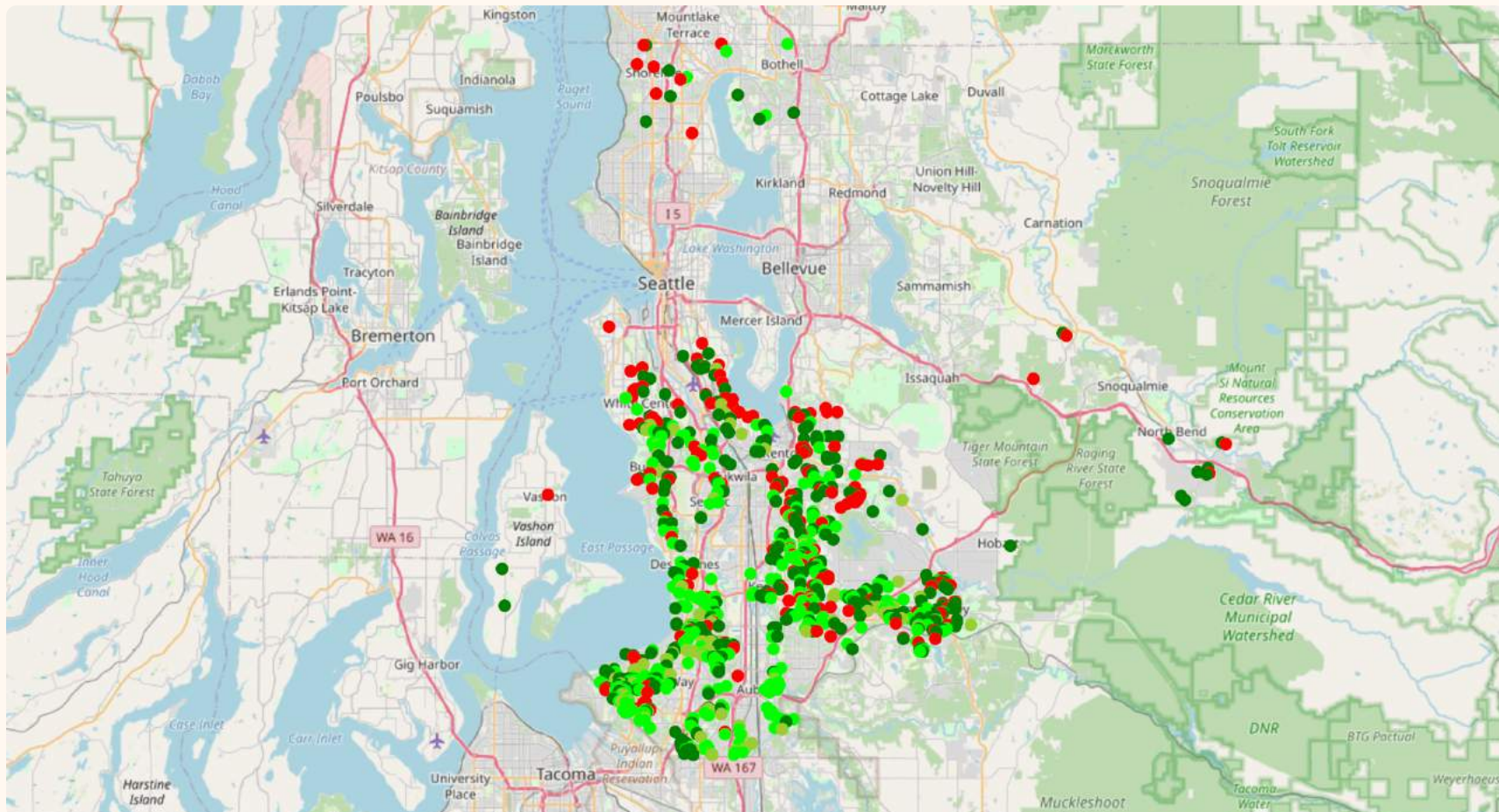
Undervalued house for sale with at least 25% ROI

priced up to \$230,000
are represented in
yellow-green.

priced up to \$280,000
are in lime.

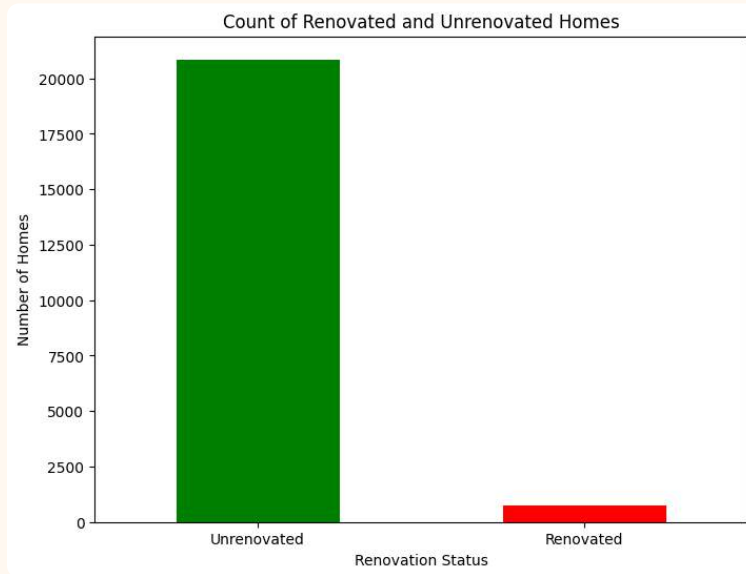
priced up to \$320,000
are displayed in green.

Properties priced above \$320,000 are highlighted in red.



Why not to renovate and sell for a higher price?

- the average house age is 40 years
- almost all houses are unrenovated

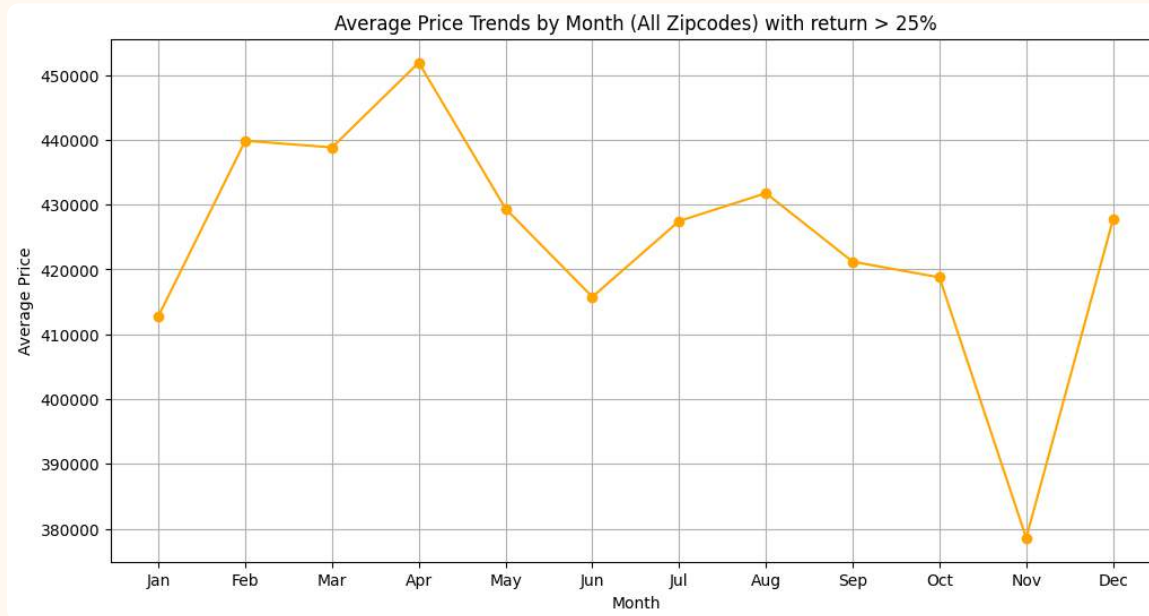


Compare houses prices with same features, but different age

- new houses that are built after 2010 and houses built before 2010
- Average Price of Newer Houses (Meeting Conditions): \$428500.00
- Average Price of Older Houses (Meeting Conditions): \$475000.00
- **Price Difference: \$-46500.00**
- Older houses have a higher demand

Timing is key

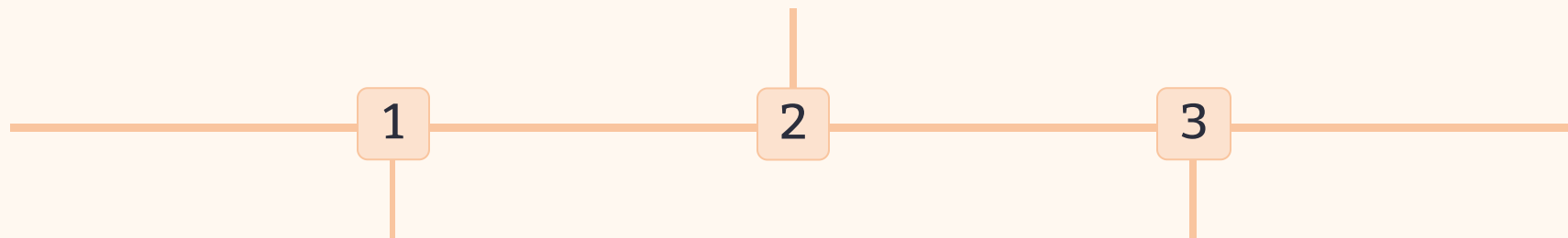
- Seasonal supply and demand
- Average time to sell for neighborhoods with > 25% Return: **174.50 days**



Buy and Sell Strategy

Timing

For optimal timing, you should consider selling properties at the beginning of the year and purchasing properties towards the end of the year. This aligns with market trends, as early-year listings tend to attract more buyers eager to make a purchase. On the other hand, year-end purchases may provide better negotiation opportunities as sellers may be more motivated to close deals before the year's end.



Finding Undervalued Houses

You should focus on identifying undervalued houses that do not require renovation, as this strategy allows for higher capital allocation. By analyzing houses with attributes such as condition, grade, and location, you can target properties that are priced lower than their market potential. This approach minimizes renovation costs and maximizes potential returns.

Average Time to Sell

Taking into account that the average time to sell a house is around 175 days, you can strategically plan your buying and selling activities. This duration can guide decisions about when to enter and exit the market, ensuring that properties are acquired and sold with the optimal timing to maximize returns.

Next Steps and Future Work



Further Analysis

We'll explore more complex data analysis techniques such as machine learning, deep learning, and artificial intelligence to extract even more insights from the data.



Client Engagement

We'll engage with our clients to provide ongoing advice and support as they navigate the complex world of real estate investing.