

# **Exploratory Data Analysis (EDA) for the King County Houses Dataset**

William Lima



**Stakeholder:** Zachary Brooks, seller.

- Invests in historical properties;
- Interested to know which are the best neighborhoods to obtain high profits;
- Best timing within a year to sell the property;
- Whether is profitable to renovate it or not.

# What is a historic house?

According to the United States's [National Park Service](#), these are the criteria to consider when declaring a property listed:

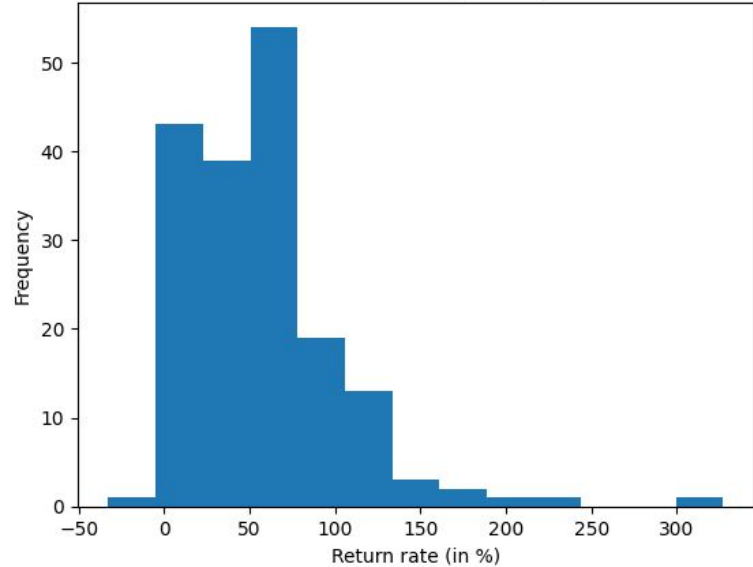
- *"Age and Integrity: Is the property old enough to be considered historic (generally at least 50 years old) and does it still look much the way it did in the past?"*
- *Significance: Is the property associated with events, activities, or developments that were important in the past? With the lives of people who were important in the past? With significant architectural history, landscape history, or engineering achievements? Does it have the potential to yield information through archeological investigation about our past?"*

Since the only piece of information we have from the dataset is the age of the of the property and the sales records are from 2014-15, we will consider historic properties as the properties built until 1965.

# What is high profit?

	Return time (days)	Profit (USD)	Return rate
<b>count</b>	177	177	177
<b>mean</b>	182	135,800.0	56.4%
<b>std</b>	67	100,600.0	46.7%

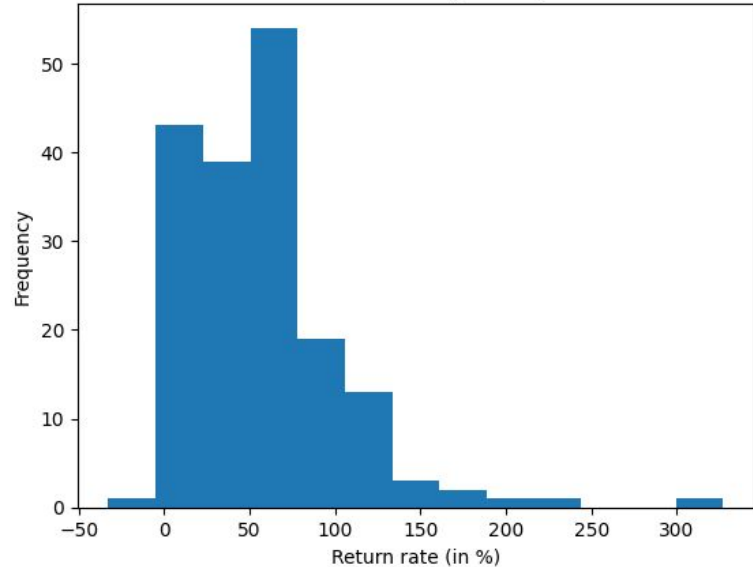
Distribution of return rates in the King County dataset in 2014-2015



# What is high profit?

	Return time (days)	Profit (USD)	Return rate
count	177	177	177
mean	182	135,800.0	56.4%
std	67	100,600.0	46.7%

Distribution of return rates in the King County dataset in 2014-2015



Best neighbourhoods? The zipcodes with high profits!

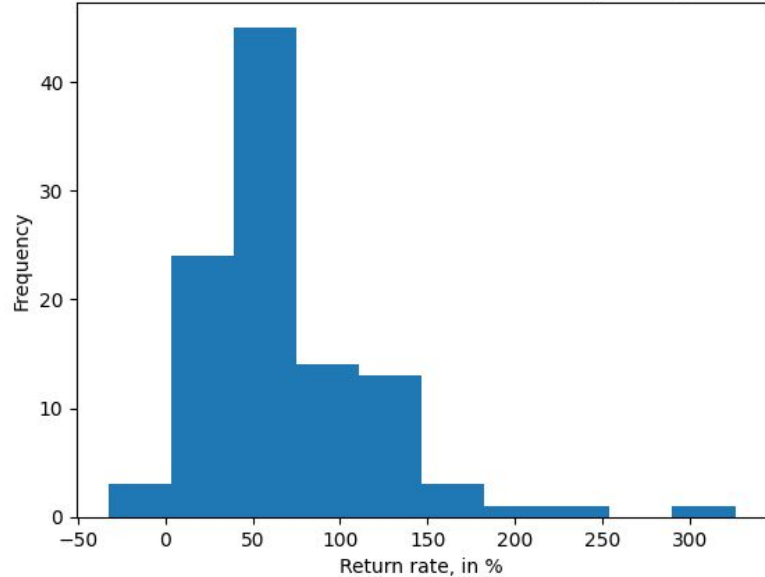
# Research questions

- Does the investment in historic properties perform better or worse than the market average?
- Is the return time of historic properties higher or lower than the market average?
- Are the return rates for historic properties seasonal, i.e. do they depend on the time of the year?
- Does renovated historic properties perform better or worse than non-renovated?
- Does the property's age influence the profit?
- Which are the best neighbourhoods for investing in historic properties?

# Are historic houses good investments?

Distribution of the return rates for historic houses in the King County dataset in 2014-2015

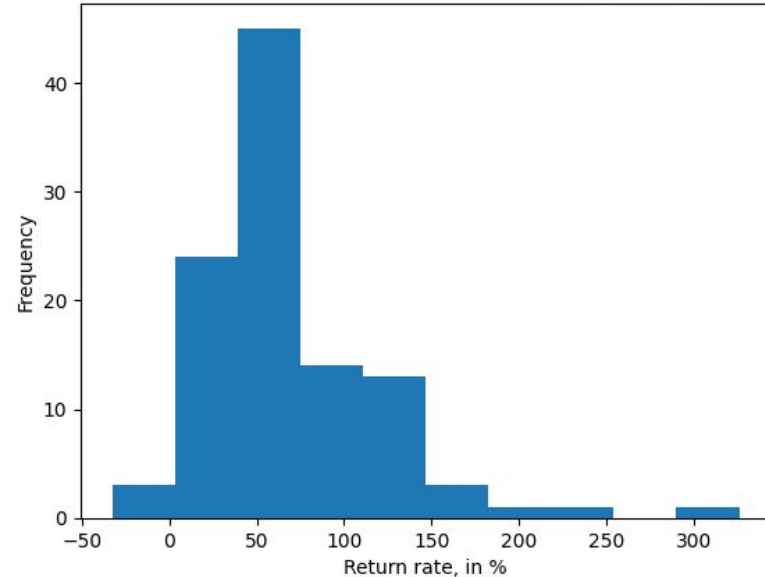
	Return time (days)	Profit (USD)	Return rate
count	105	105	105
mean	186	157,800.0	68.3%
std	65	104,000.0	50.5%



# Are historic houses good investments?

Distribution of the return rates for historic houses in the King County dataset in 2014-2015

	Return time (days)	Profit (USD)	Return rate
<b>count</b>	105	105	105
<b>mean</b>	186	157,800.0	68.3%
<b>std</b>	65	104,000.0	50.5%

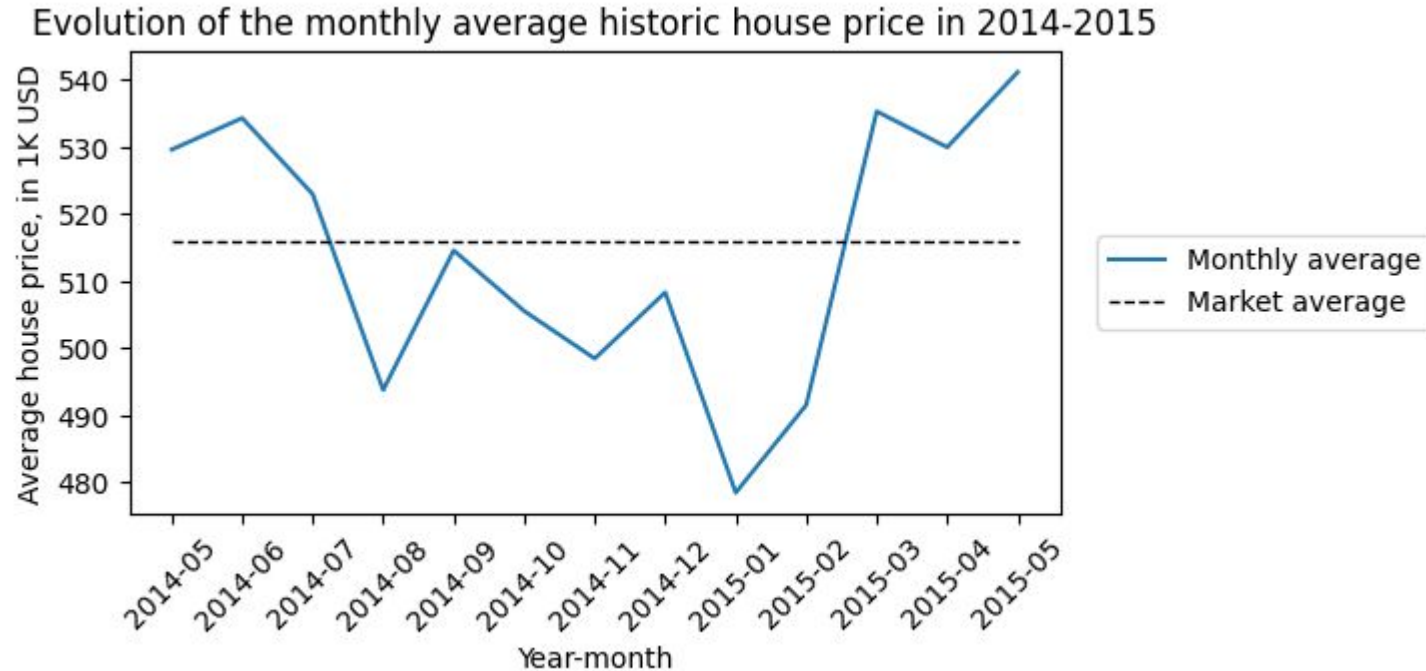


The historic houses outperformed as investments (68% r.r.) with respect to the market average (56% r.r.).

The average return time for historic properties is 186 days, vs. 182 days market average.

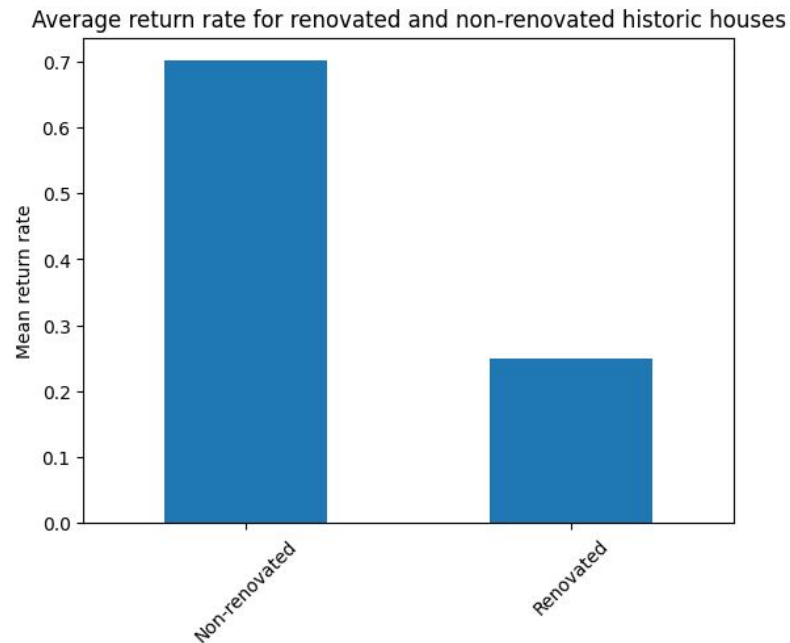


# Is the investment in historic houses seasonal?



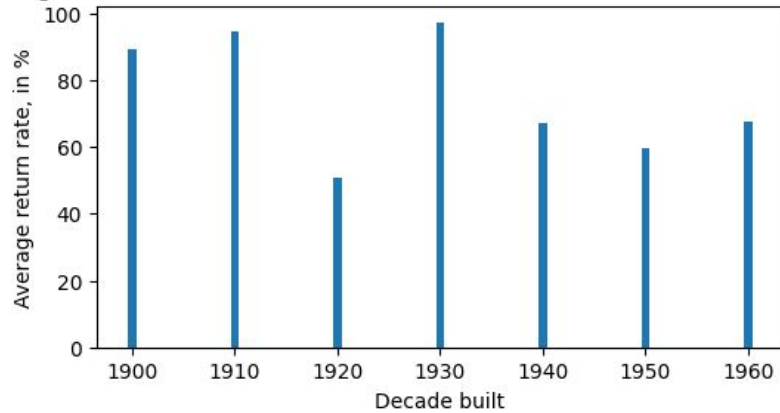
# Renovate or not?

Renovated?	Count	Mean return time (days)	Mean profit (USD)	Mean return rate
No	101	187	160,000.0	70%
Yes	4	160	91,000.0	25%

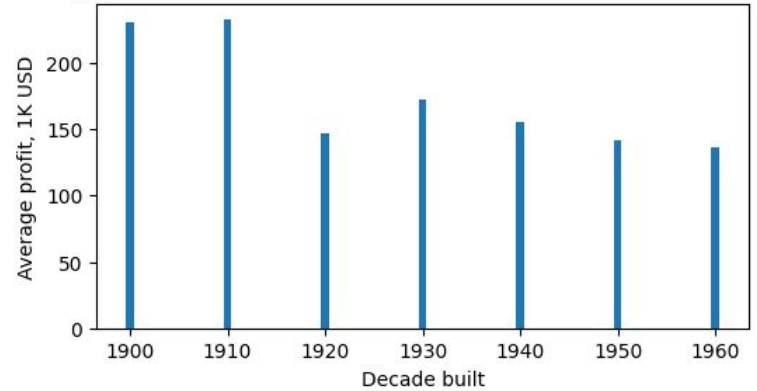


# The older, the better?

Average return rate for histoic houses built in various decades in 2014-2015

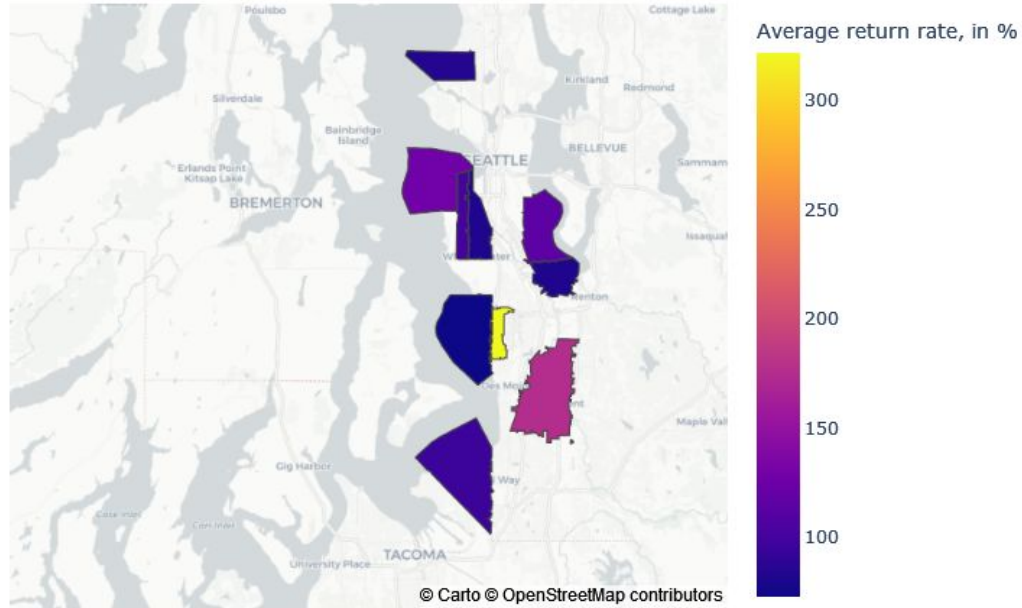


Average profit for histoic houses built in various decades in 2014-2015



# Best neighbourhoods to invest

Top 10 neighbourhoods with high profit



# Conclusions

- Historical houses were built before 1965 and high profits have return rate higher than 56%
- Historical houses are good investments: they outperform w.r.t. the market average in return rate and their return time is in line with the market average
- Seasonality: should buy in winter and sell in spring to max profits
- No need for renovations
- Age doesn't seem to influence return rate
- Best neighbourhoods are closer the waterfront

THANK YOU!!!

...questions?