



ZILLOW
DATASET.

TIME SERIES.
PROJECT

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OVERVIEW.



Real Estate Investment Firms offers comprehensive advisory services, aiming to optimize investment decisions, mitigate risks, and ensure long-term success. By conducting market research, property analysis, and financial modeling, they identify opportunities in real estate markets and capitalize on them for significant profits. They prioritize investments based on factors like market volatility, demand, and growth potential. Their strategies focus on generating consistent cash flows and achieving clients' financial objectives, establishing long-term partnerships through successful real estate investments.

BUSINESS UNDERSTANDING.



Matawi Real Estate Investment firm aims to identify the top five areas with the best investment opportunities. They strategically select areas that show strong growth potential and favorable real estate market conditions.

Using data from Zillow Research, the firm makes data-driven investment decisions to optimize their portfolio. Through a comprehensive analysis of factors like price trends, growth rates, and market demand, they determine the areas with the highest potential for future price appreciation.



DATA UNDERSTANDING.

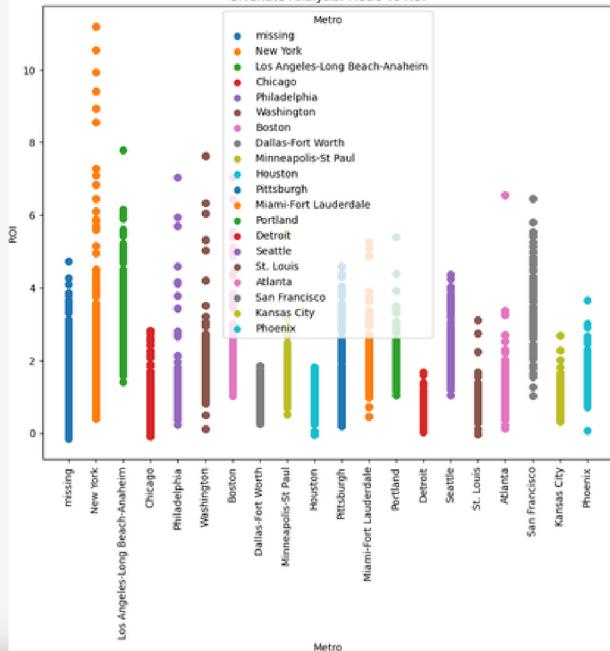
The dataset used in this project consists of historic median house prices from various regions in the USA. It covers a time period of 22 years, specifically from April 1996 to April 2018. The dataset was obtained from the Zillow website. [Zillow website](#).

This data contains 272 columns and 14,723 rows. It has the following columns.

- RegionID
- RegionName
- City
- State
- Metro
- CountyName
- SizeRank
- DateColumns

EXPLORATORY DATA ANALYSIS

Bivariate Analysis: Metro vs ROI

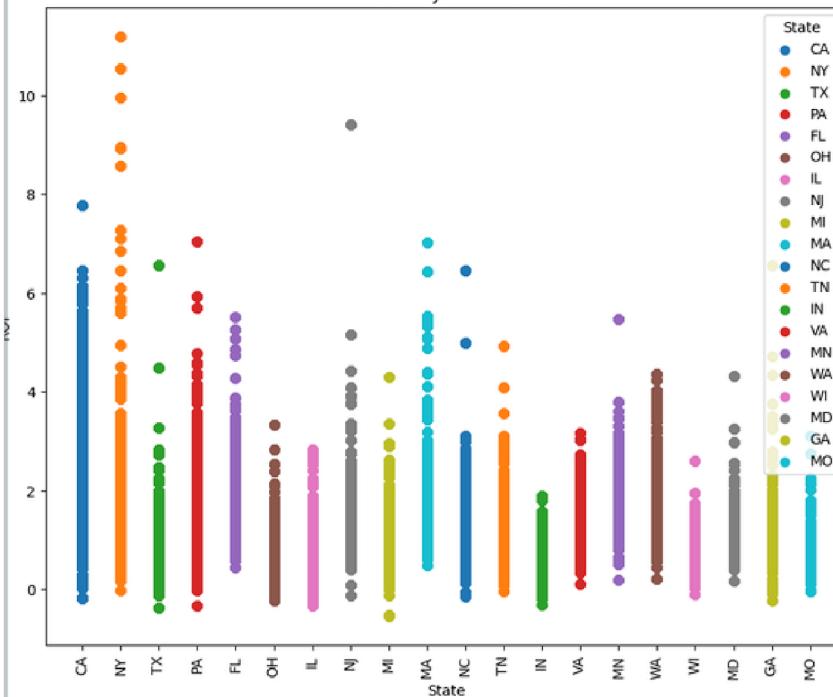


The metropolitan area with the highest Return On Investment is New York.



EXPLORATORY DATA ANALYSIS

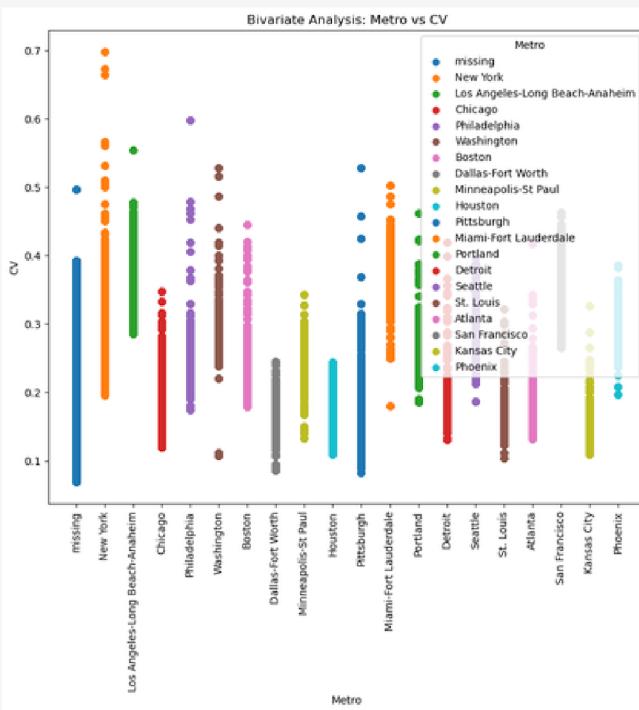
Bivariate Analysis: State vs ROI



The State with the highest Return On Investment is California.



EXPLORATORY DATA ANALYSIS

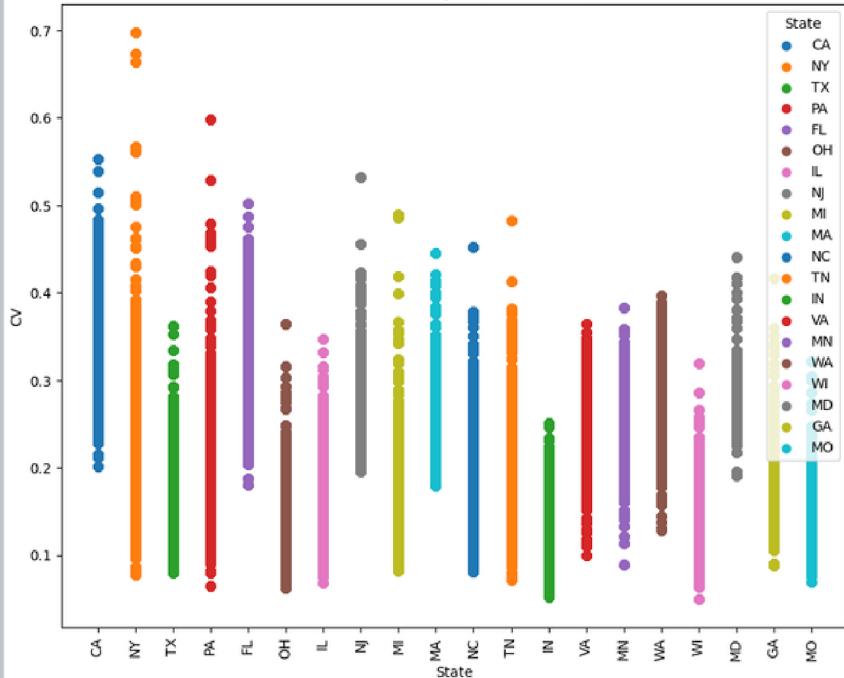


The Metropolitan region with the highest volatility indicating high risk in investing is New York.



EXPLORATORY DATA ANALYSIS

Bivariate Analysis: State vs CV



The state with the highest volatility indicating high risk in investing is New York.



MODELLING: TIME SERIES

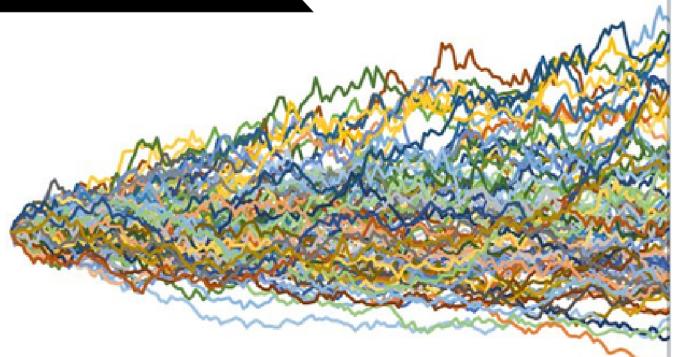
Time series modeling was chosen as it refers to building a machine learning model that can auto-generate future predictions based on existing or historical data which was our dataset.

The models include:

Autoregressive Model (Base Model)

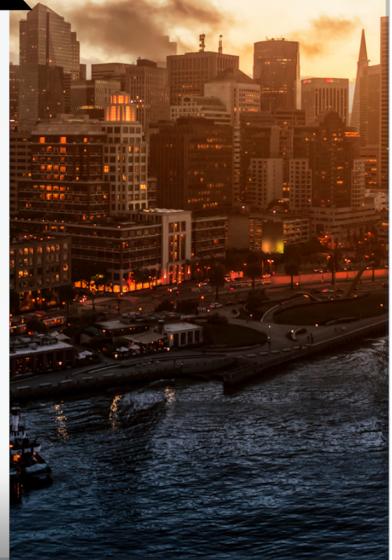
ARIMA

SARIMA

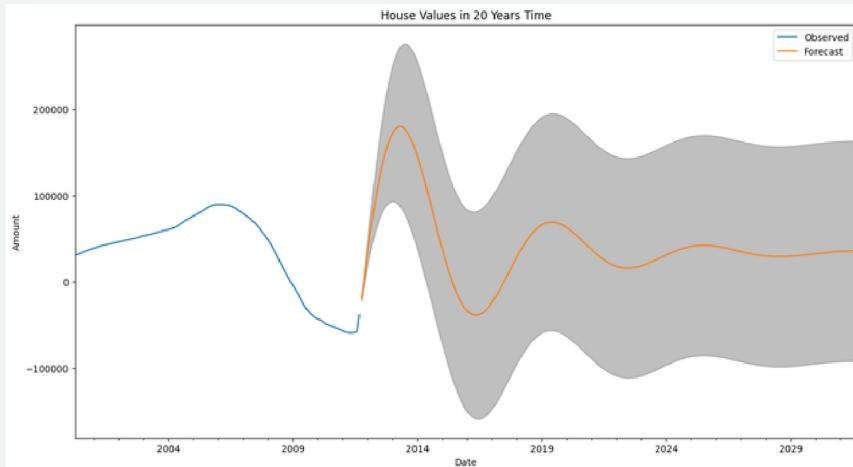


MODELLING RESULTS

Our model had a lower RMSE which is better because it makes more accurate predictions, even if it's more complex. The RMSE takes into account both how well the model predicts and how complex it is. So a model with a lower RMSE is more accurate, even if it's more complex.



FORECASTING



According to the model's projections, there will be a notable increase in house prices in the coming year, which will be followed by a significant decline over the next three years. Afterward, there will be a moderate rise in prices for the following three years, succeeded by a smaller decrease over the subsequent four years. Finally, in the later years, house prices are expected to have minimal fluctuations.

FORECASTING RESULTS

According to the model's projections, there will be a notable increase in house prices in the coming year, which will be followed by a significant decline over the next three years. Afterward, there will be a moderate rise in prices for the following three years, succeeded by a smaller decrease over the subsequent four years. Finally, in the later years, house prices are expected to have minimal fluctuations.

Conclusions.

1. The housing market in New York, Los Angeles, and other top cities, states, metros, and counties demonstrates high activity and a significant number of houses.
2. Return on investment (ROI) and house prices exhibit positively skewed distributions, with outliers indicating higher returns and extremely high-priced houses.
3. There is a strong positive relationship between ROI and the coefficient of variation (CV), implying that higher risk is associated with higher returns.
4. New York consistently stands out as the location with the highest ROI across different levels of analysis, such as states, metros, and counties.
5. San Francisco, Los Angeles, and other specific cities, states, metros, and counties offer a combination of high ROI and lower risk, making them attractive for real estate investment.

Recommendations.

- Consider investing in real estate in New York, particularly in cities like San Francisco and Los Angeles, which have shown high ROI and relatively lower risk.
- Focus on short-term investment opportunities to capitalize on the predicted high increment in house prices for the next year.
- Adopt a conservative approach during the anticipated high decrement period of the following three years and carefully assess market conditions before making major investments.
- Consider selling properties at their peak value before the reduced increment period to maximize profits and mitigate potential losses.
- Diversify the portfolio across different locations and property types to spread risk and minimize exposure to market downturns.
- Monitor the real estate market closely, staying updated on trends, economic indicators, and regulatory developments to make informed decisions.
- Mitigate risks through thorough due diligence, assessing property quality, and conducting proper market research.

Next Steps

- - Continuously monitor and evaluate the performance of your real estate investments, adjusting your strategies as needed based on market conditions and changing investment goals.
- Stay updated with market trends and economic indicators that can impact the housing market, such as interest rates, employment rates, and local infrastructure developments.
- Consider consulting with real estate professionals or experts familiar with the target markets to gain valuable insights and guidance for investment decisions.
- Evaluate the potential rental market in the selected locations, as rental income can contribute to overall returns and provide stability during market fluctuations.

THE TEAM



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