

Time Series Analysis



Jacksonville Housing Prices by Zip Code

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Understanding the Business Problem

The Business

My job is to help clients relocate, usually for work. I must:

- Consider the client's needs for a new home
- Help them find the best house quickly

The Client

- Signed a new, 2-year work contract in Jacksonville, Fl.
- wants a home that will offer the greatest 2-year ROI.

The Goal

- Forecast housing prices by zip code
- Identify the areas that offer the best ROI

Complications and Assumptions

Economic Trends

COVID and the resulting economic conditions drastically affected housing prices.

Modeling Implications:

- Price recovery point is difficult to predict
- The “best” model may not be the one with optimal metrics

Assumptions

Pre-COVID conditions are more indicative of long term trends and growth

Method of Determination:

- Analysis of additional data, including:
 - Sale-to-list price ratio
 - Housing inventory levels
 - Median days pending per sale
- Interest rate changes and projections

See Appendix [here](#) for a detailed breakdown

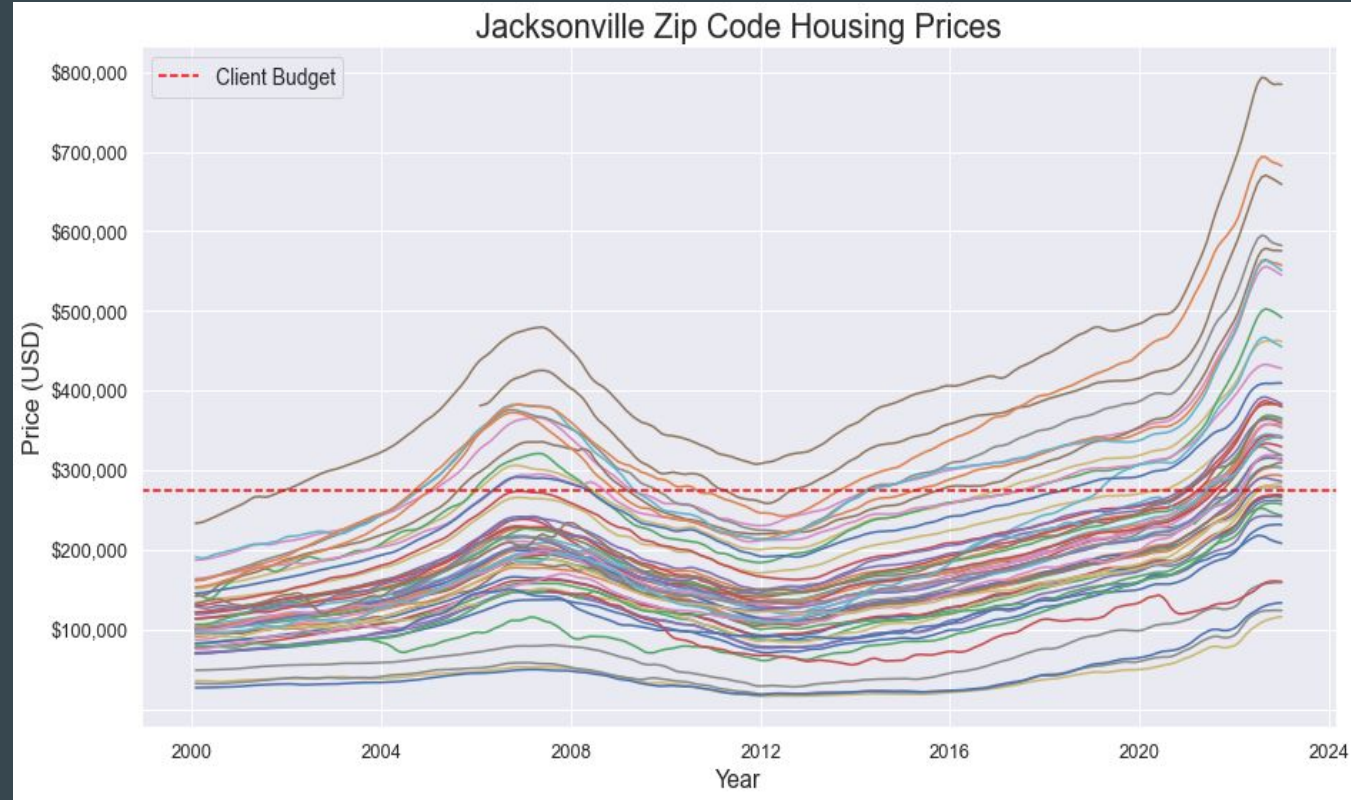
Housing Prices Dataset

- Sourced from [Zillow](#)
- Smoothed (non-seasonal)
- Includes prices by zip code from 1996

My analysis will use data from 2012 onward. This period best captures the current pricing trends.

Trend analysis

- Similar trends are found across each zip code.
- Price range based on client budget:
\$200,00 - \$300,000



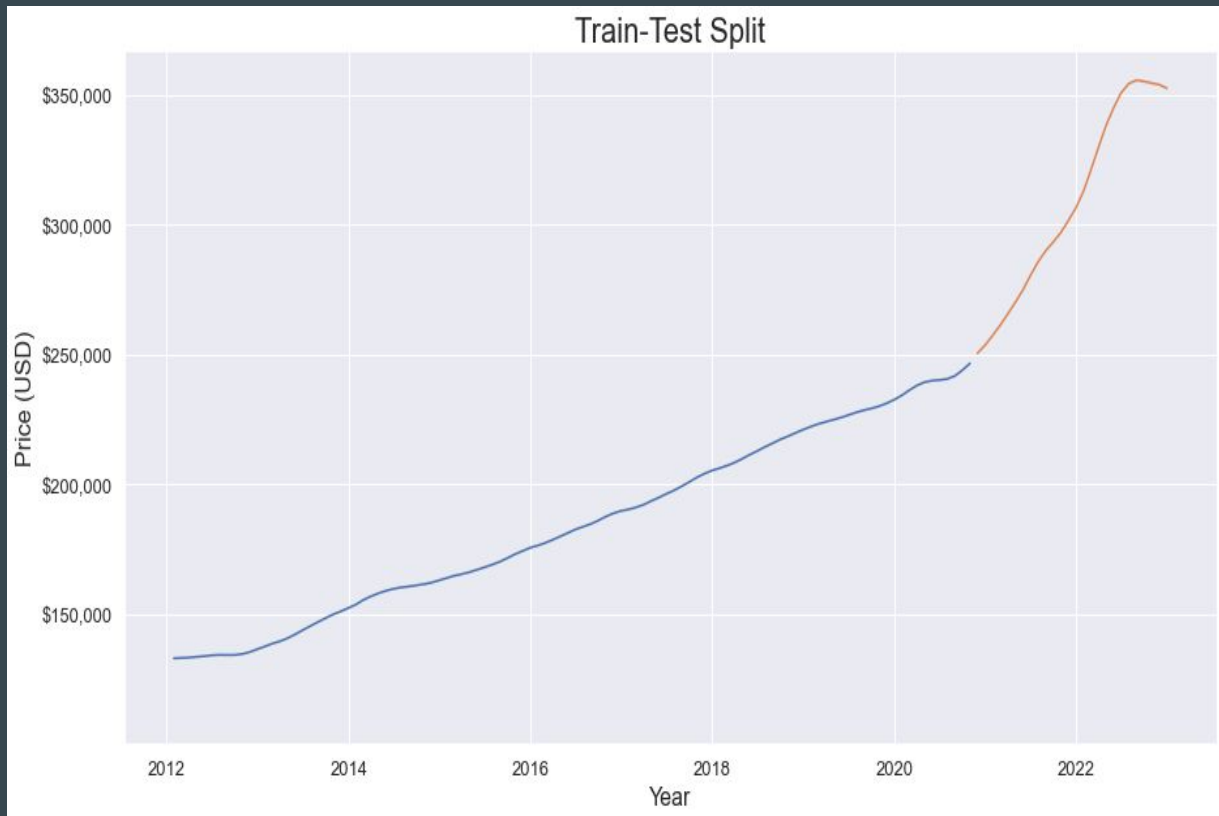
Identifying Possible Zip Codes



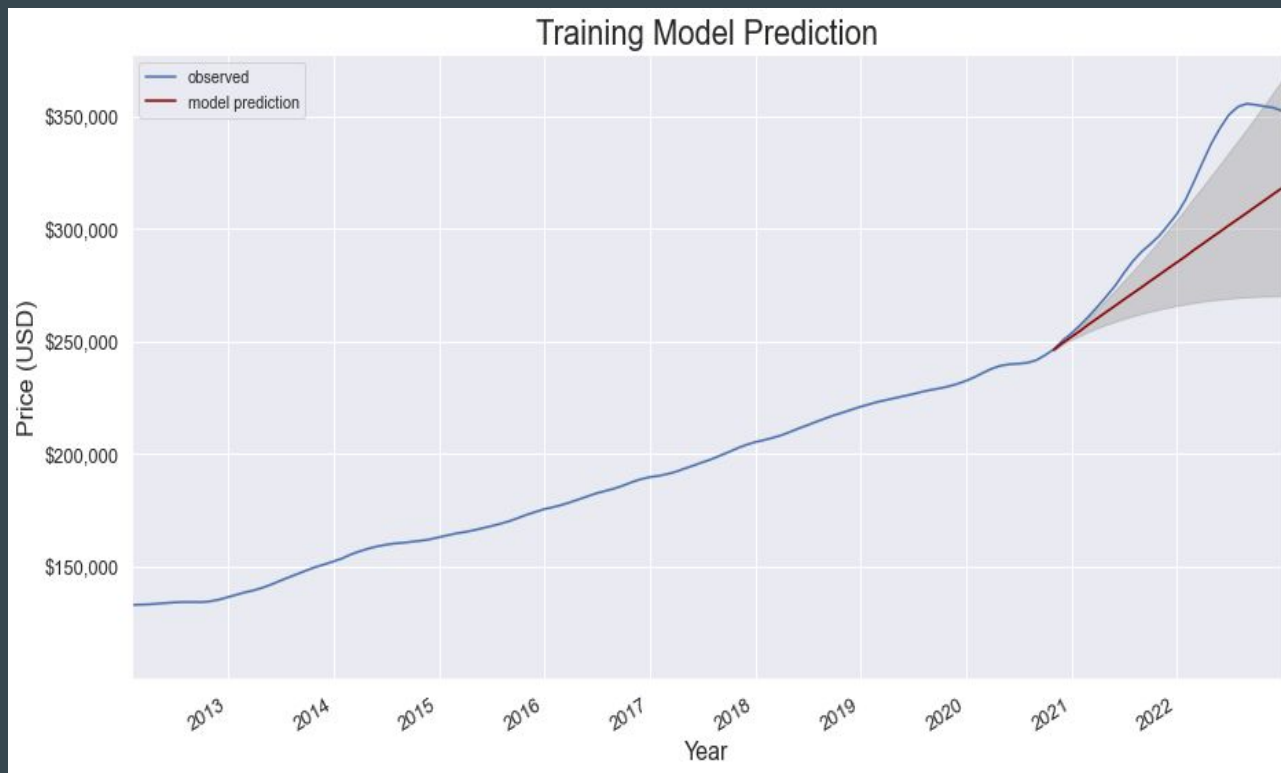
- 14 of 56 Jacksonville zip codes are within the budget range
- 3- and 6-year ROIs look promising

Modeling Preparation

- Different trends are seen pre- and post- COVID
- Pre-COVID trends will be used for model parameter selection.

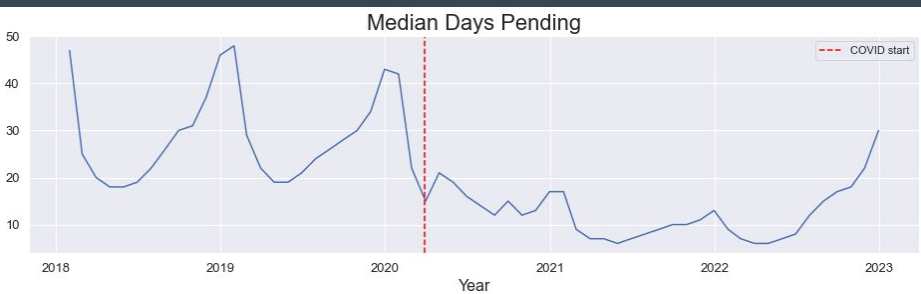
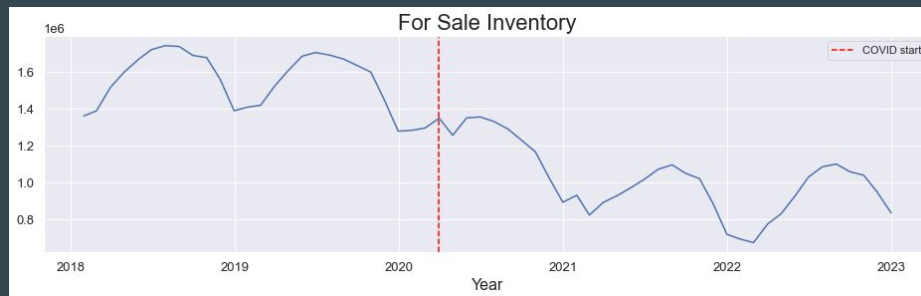


Training Model Diagnostics



- RMSE: \$29,488
- Fails to account for post-COVID boom
- Still provides the best metrics for price forecasting

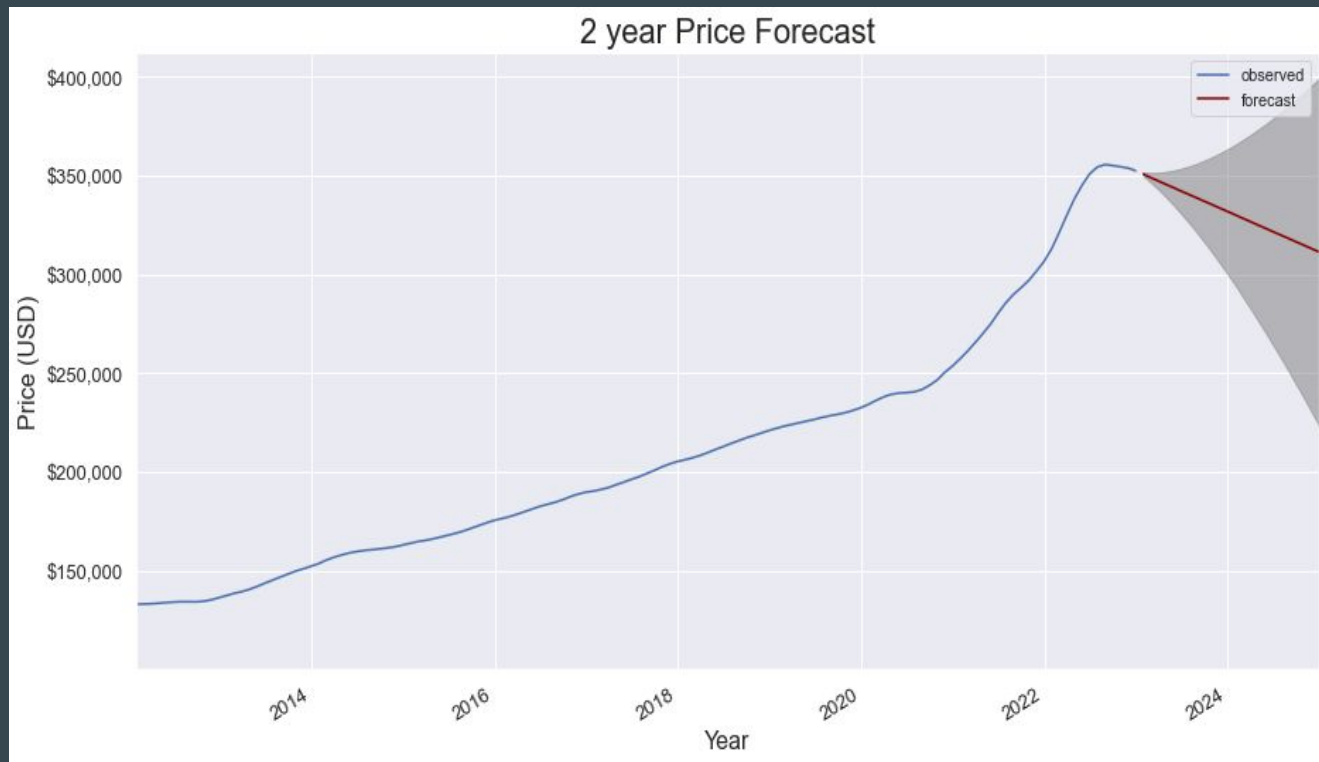
Additional Data:



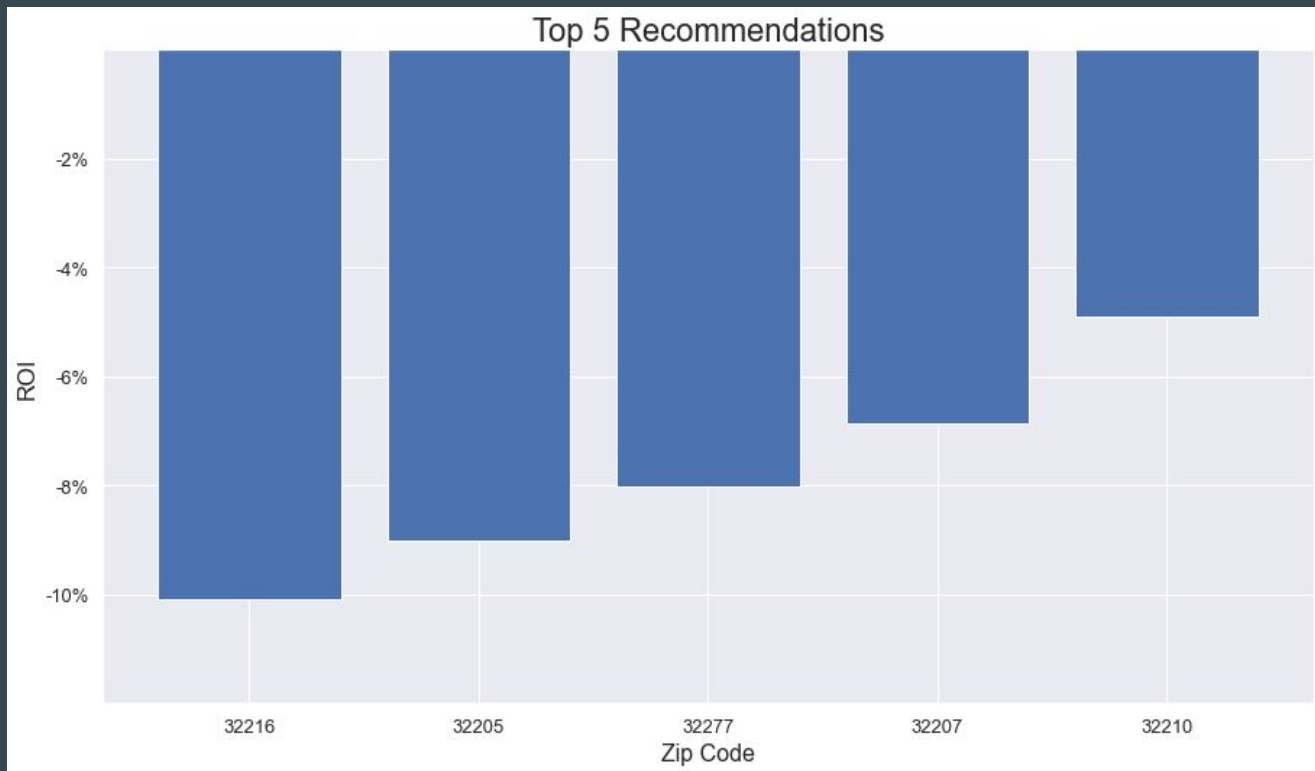
- Evidence of pandemic effects begins in early 2023
 - Days Pending and Sale-to-List Ratio are showing signs of a return to pre-pandemic levels.
 - It is likely that price trends will also return to pre-pandemic levels.
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Model Forecasting

- The exact forecasts have low confidence, but should provide a good relative comparison between zip codes

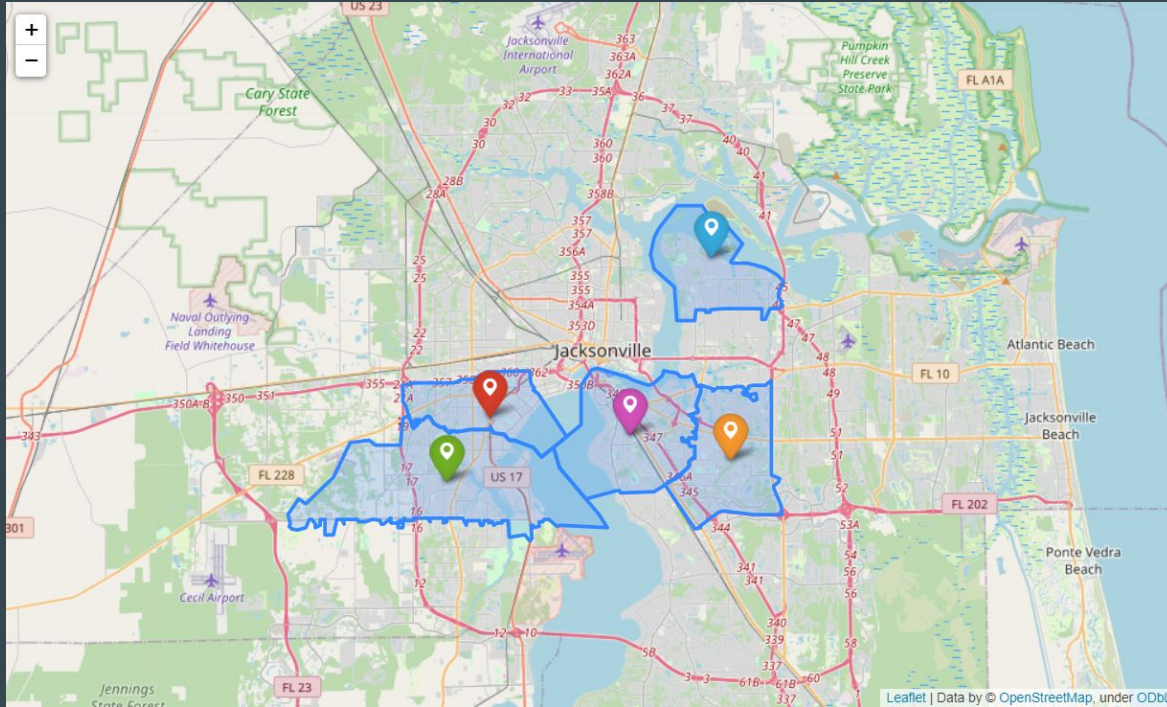


Results



- The models predict a drop in price across all zip codes.
- These 5 zip codes retain the most value

Final Recommendations



The client should narrow their search to the 5 identified zip codes:

- 32210
- 32207
- 32277
- 32205
- 32216

Next Steps:

- Communicate findings with the client
- Refine the recommendations using their additional criteria (commute time, neighborhood, convenience, etc.)

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[LinkedIn](#)

[GitHub](#)