

A map of Hudson County, New Jersey, with various regions highlighted in different colors: green, red, orange, and light green. Several zip codes are labeled in white boxes: 07032, 07029, 07307, 07030, and 07302. The map also shows major roads like I-95 NJTP and I-78, and nearby locations like Belleville, North Arlington, Secaucus, and Newark. The Hudson River is visible on the right side.

# Finding the best areas to invest in Hudson County, NJ

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# BUSINESS UNDERSTANDING

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Thanks for hiring me . It's May 2018 and you, a Private Equity company, want to invest in Hudson County, NJ real estate.

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You know that Hudson County real estate has been very profitable over the past 20 years.

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The question you have is: **which zip codes should you invest in?**

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**Investment Horizon: 5 Years**

$$\text{ROI}\% = \frac{\text{final predicted price} - \text{final observed price}}{\text{final observed price}} \times 100$$

# DATA UNDERSTANDING

I used an outstanding dataset from Zillow that contains monthly average sales data from almost every zip code in the United States from 1996-2018.

1996–2018

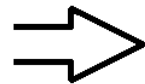
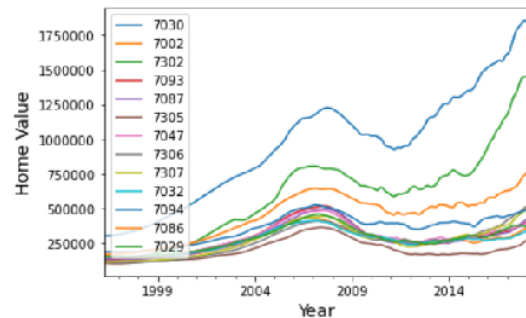
2018–2023

Using that data, I used a SARIMAX model to calculate which of Hudson County's zip codes would have the highest ROI% from 2018-2023.

# MODELING

- I used a Seasonal Autoregressive Integrated Moving Average with eXogenous factors(SARIMAX) model to predict the highest returners.
- Why SARIMAX? SARIMAX specializes in making predictions with seasonal data(data that has regular and predictable changes).

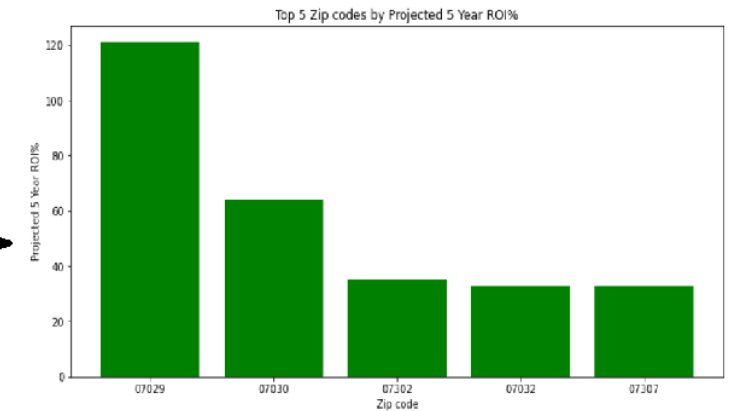
HIGHLY SEASONAL DATA



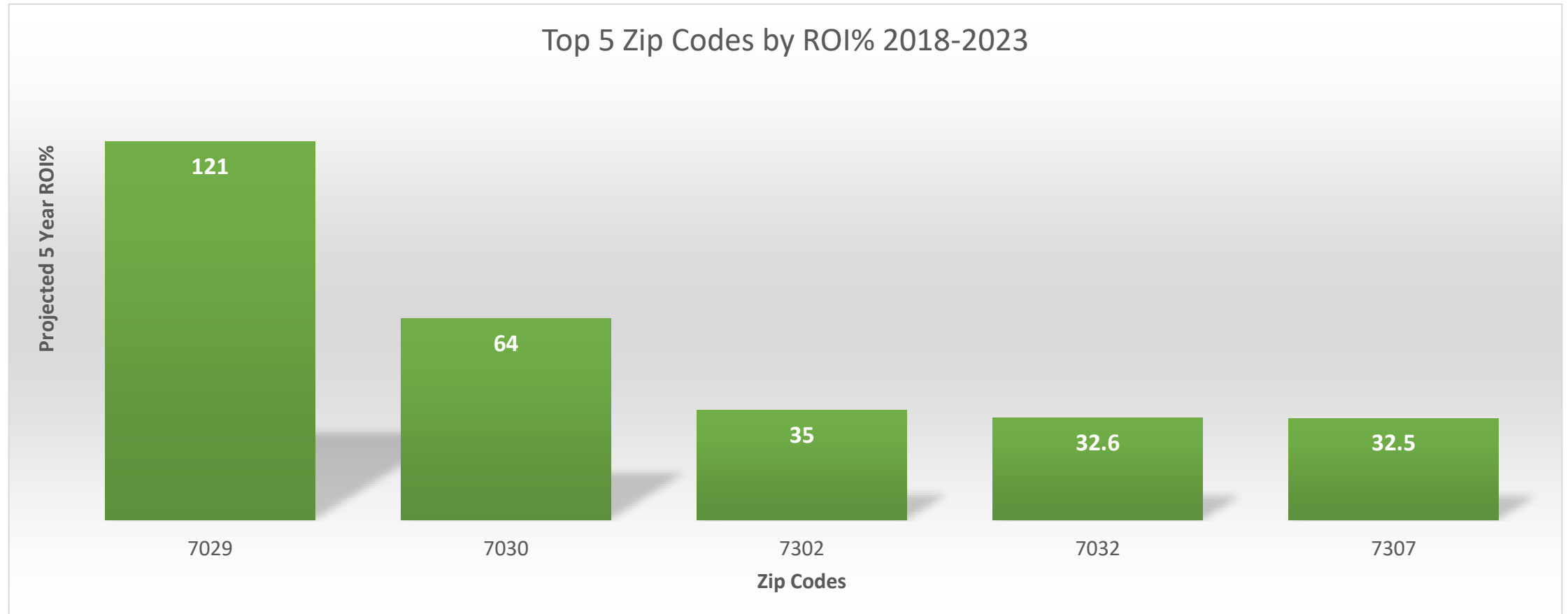
SARIMAX



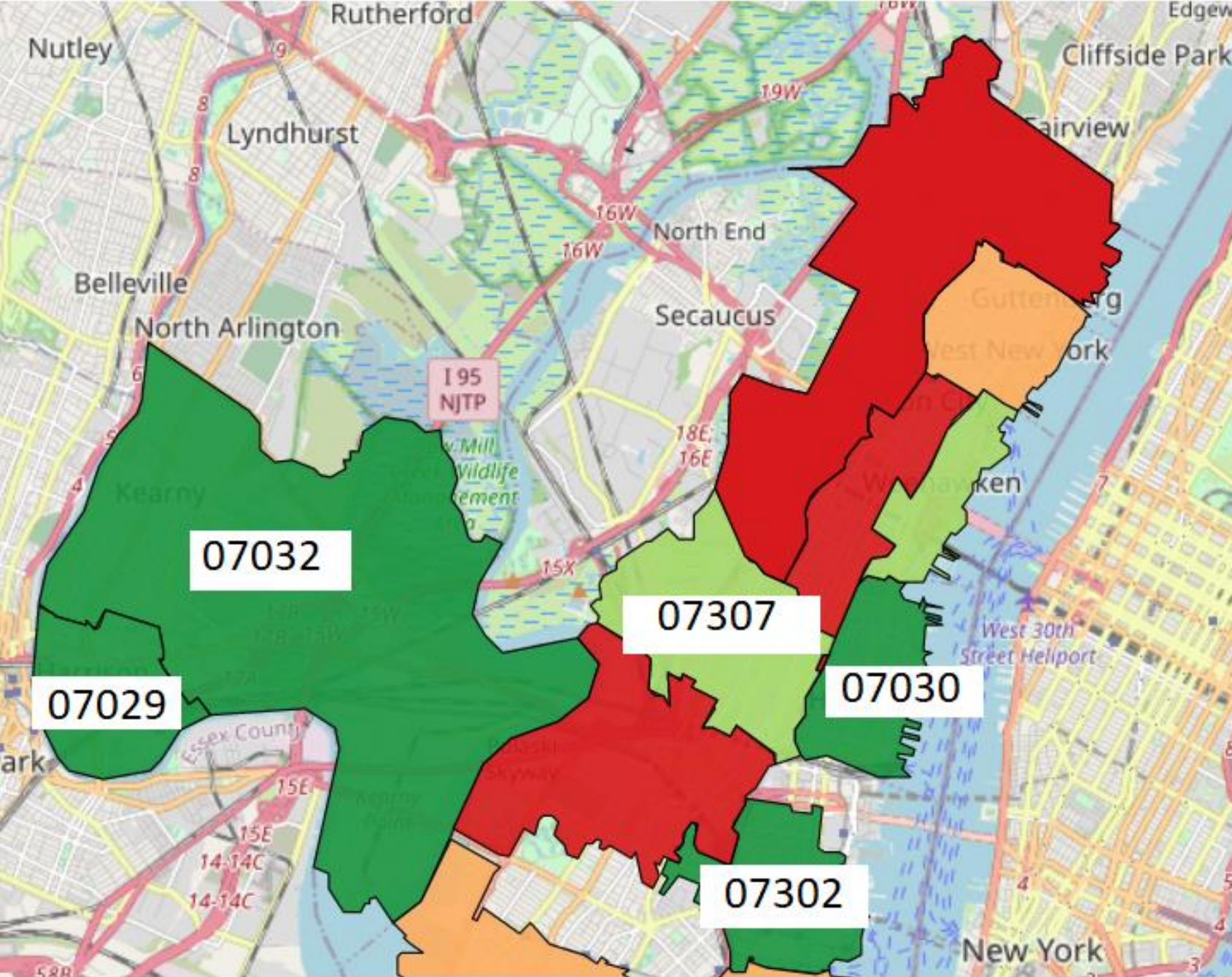
ACTIONABLE PREDICTIONS



# RESULTS







# RESULTS- MAPPING

# RECOMMENDATIONS

Invest in 07029,  
07030, 07302,  
07032, and 07307.

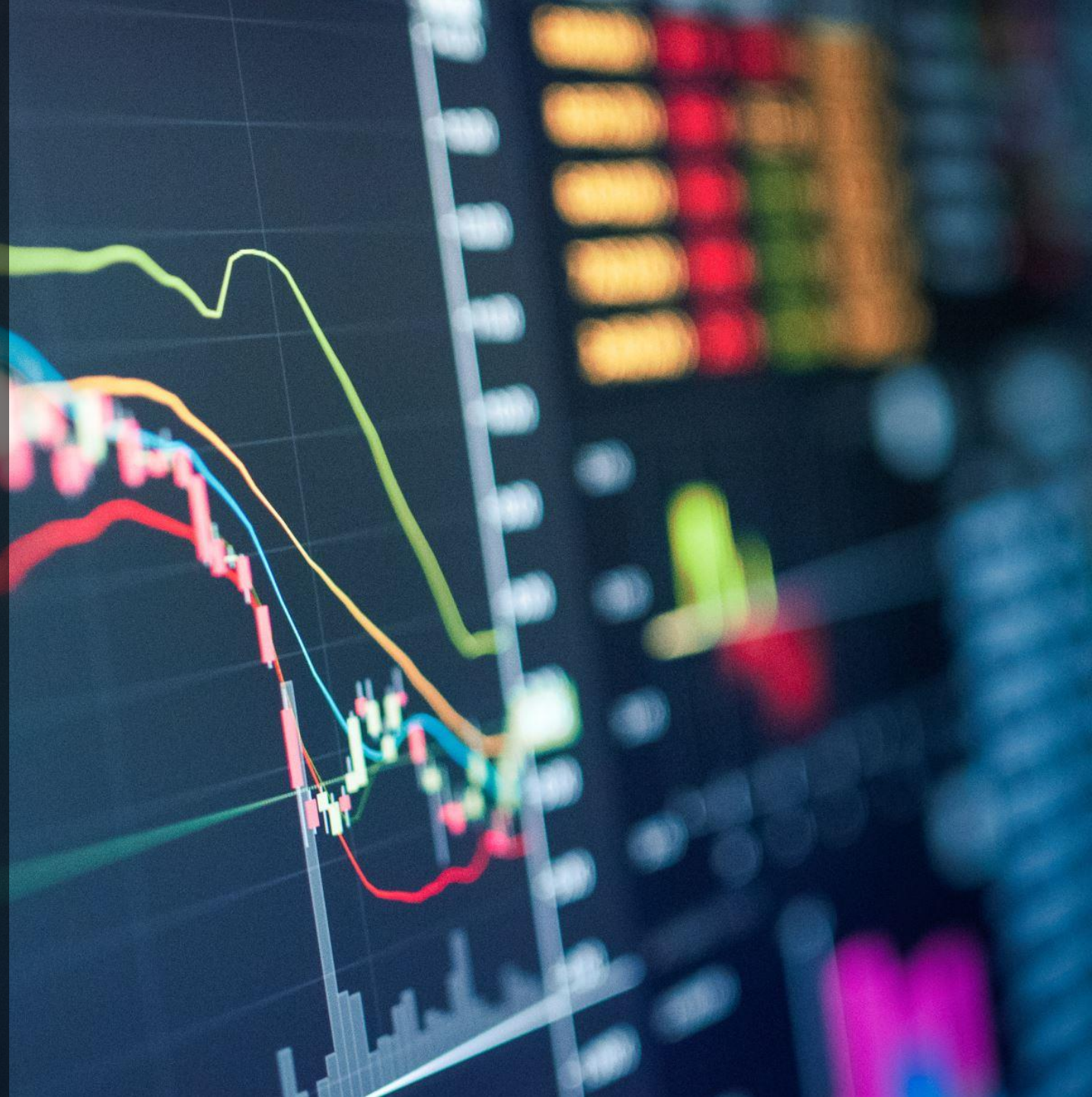
If you are looking  
for homes below  
500k, target  
07029 and 07032.





# NEXT STEPS

- Include 07304 and 07310.  
For some reason, the Zillow dataset did not contain any data on those zip codes.
- Another ML model may yield more fruitful results.  
An XGBoost Regressor or a neural network model may yield better and more meaningful results.







Thanks!

Github:[https://github.com/icapeli/Phase\\_4\\_Time\\_Series](https://github.com/icapeli/Phase_4_Time_Series)

A view of Jersey City, NJ from the Hudson River.

