Nassau County Time Series Analysis

ZILLOW REAL ESTATE

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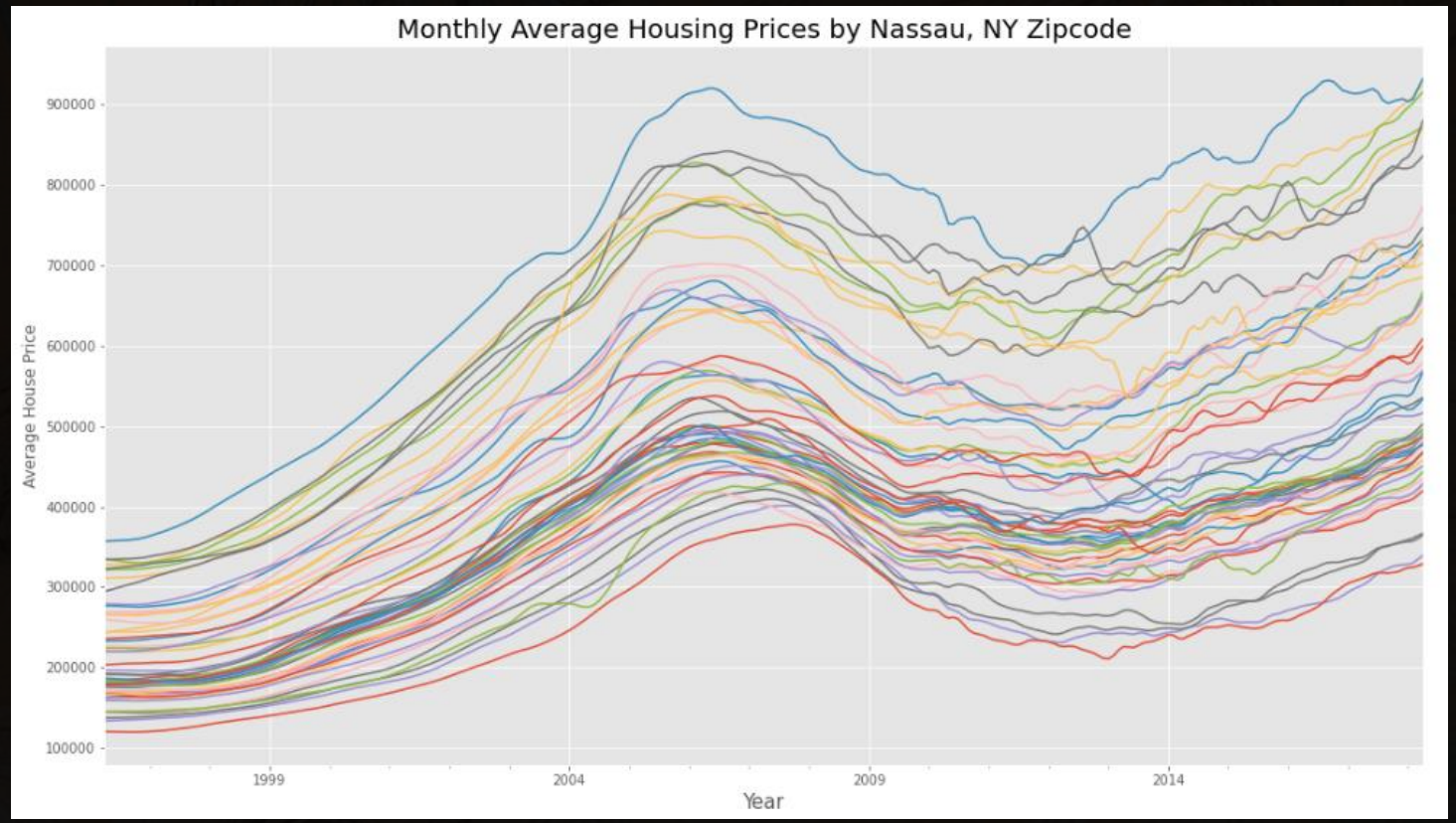
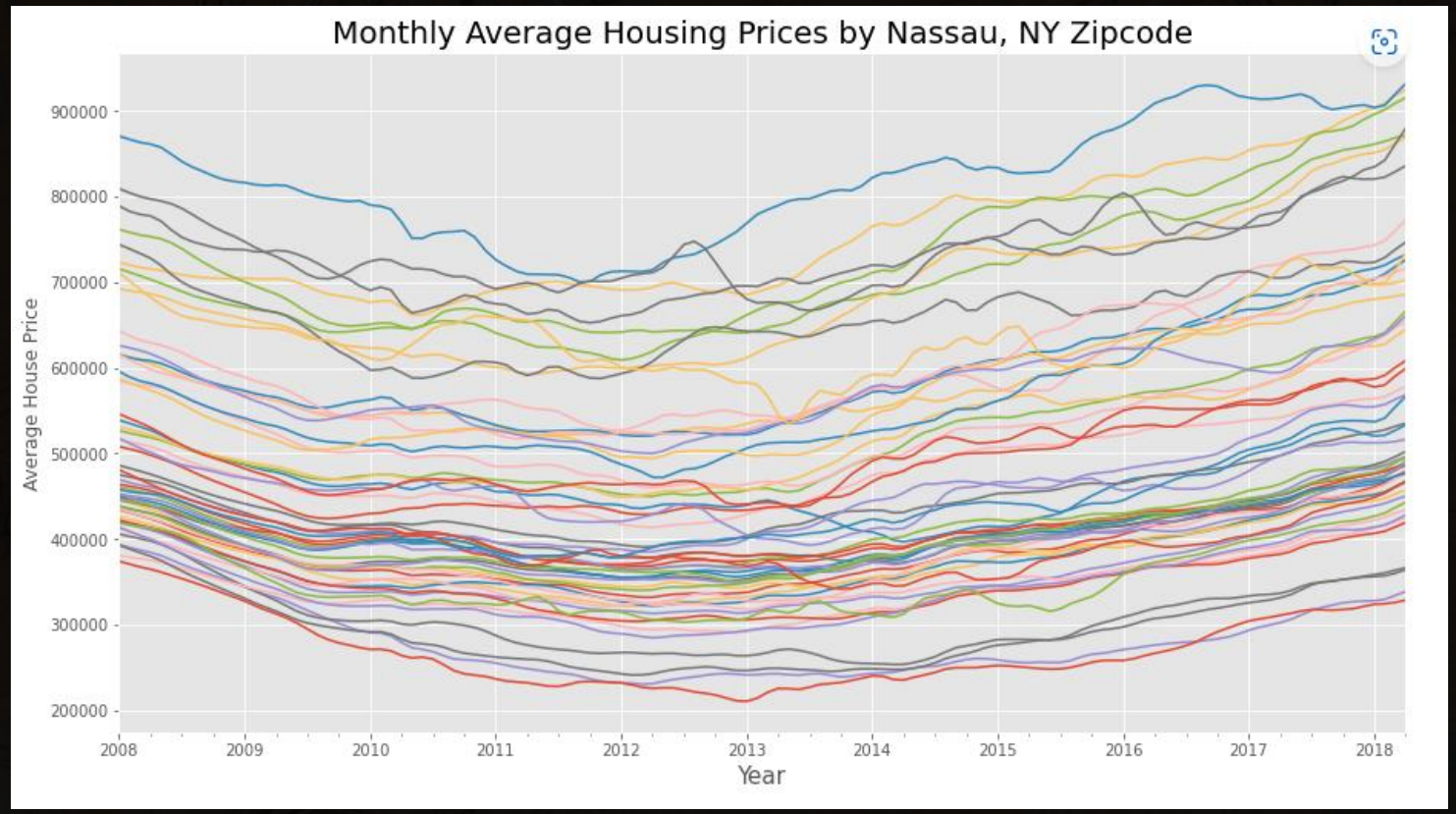
Business Problem

- Our clients are a Real Estate Investment Firm looking to invest in Long Island New York, specifically Nassau County, with a budget of $1,000,000.00.
- Our task is to conduct a time series analysis to predict the 5 best zip codes to invest in based on ROI.
- The Dataset consists of Housing Prices in the United States from the years 1996-2018, with our frequency being Monthly Mean Values.
- Due to the 2008 Housing Crisis, we decided to focus on 2012 and onwards.

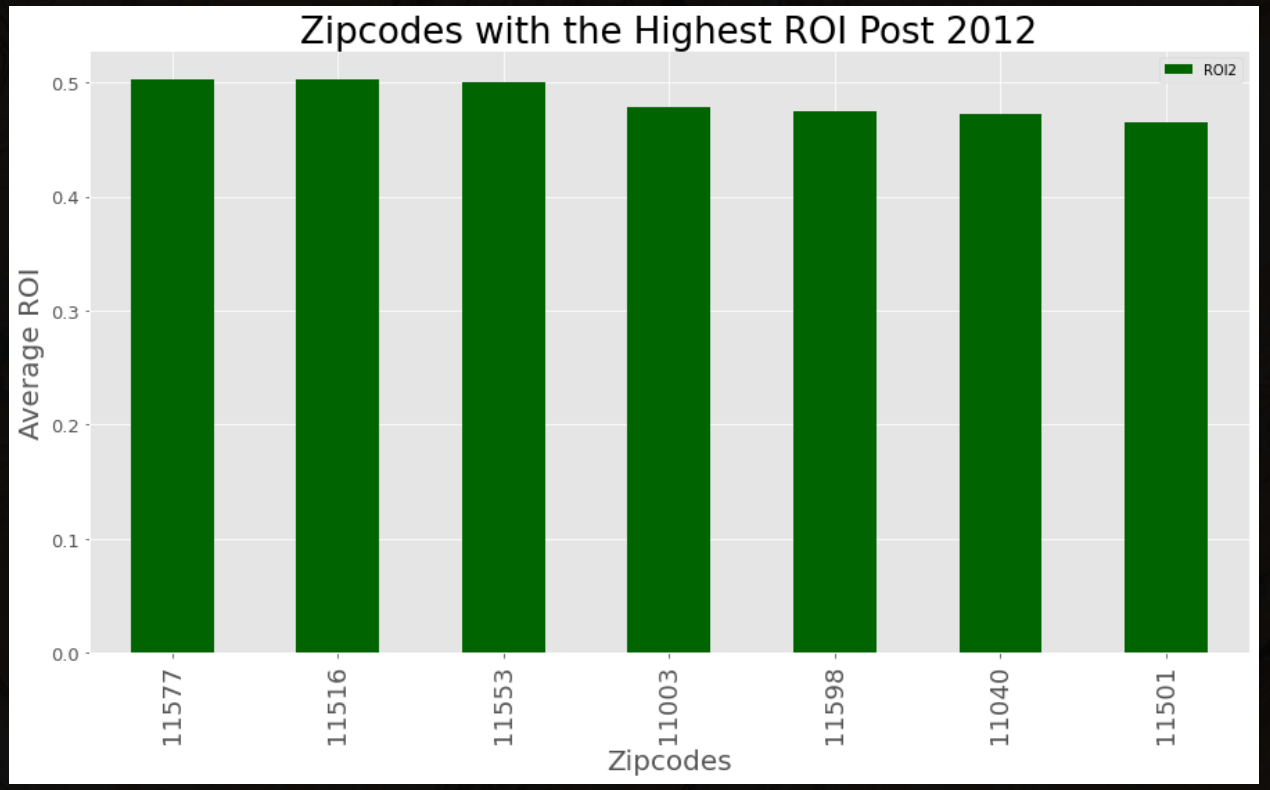
Average Housing Prices 1996 - 2018



Average Housing Prices 2008 - 2018



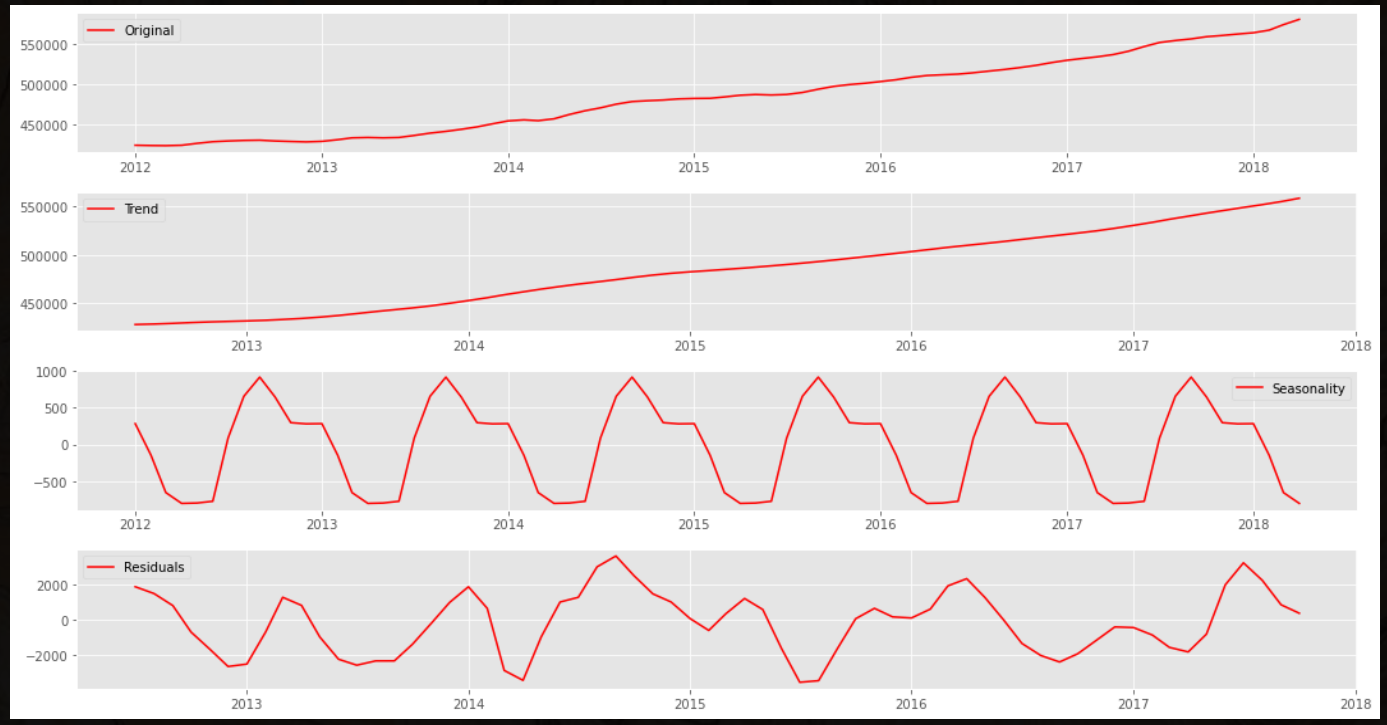
TOP 10 Zip codes based on ROI



2012 - 2018

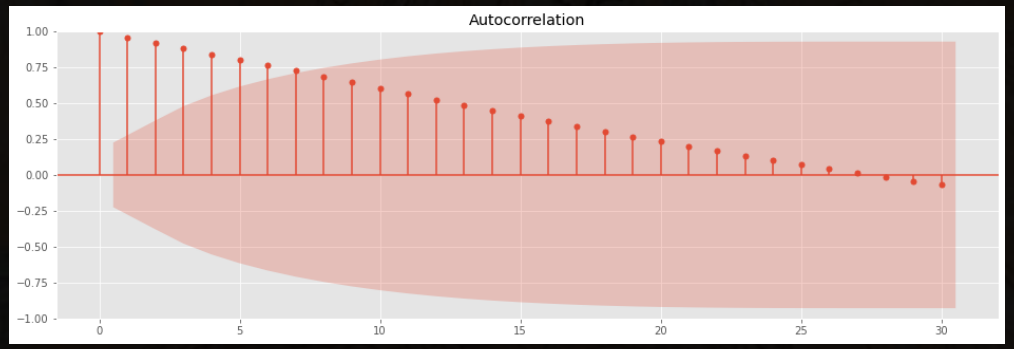
11577: Roslyn Heights
11516: Cedarhurst
11553: Uniondale
11003: Elmont
11598: Woodmere
11040: New Hyde Park
11501: Mineola

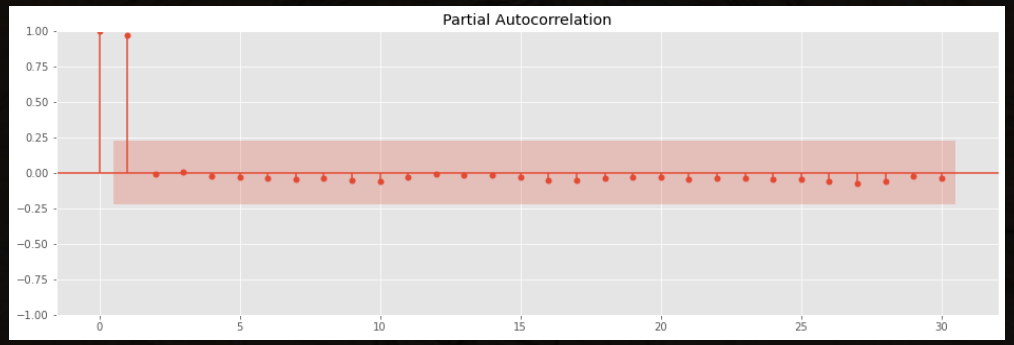
Seasonal Decomposition



- Trend is Increasing
- Seasonality exists
- Residuals are not stationary
- Variations of these components must be removed for a proper time series model

Autocorrelation

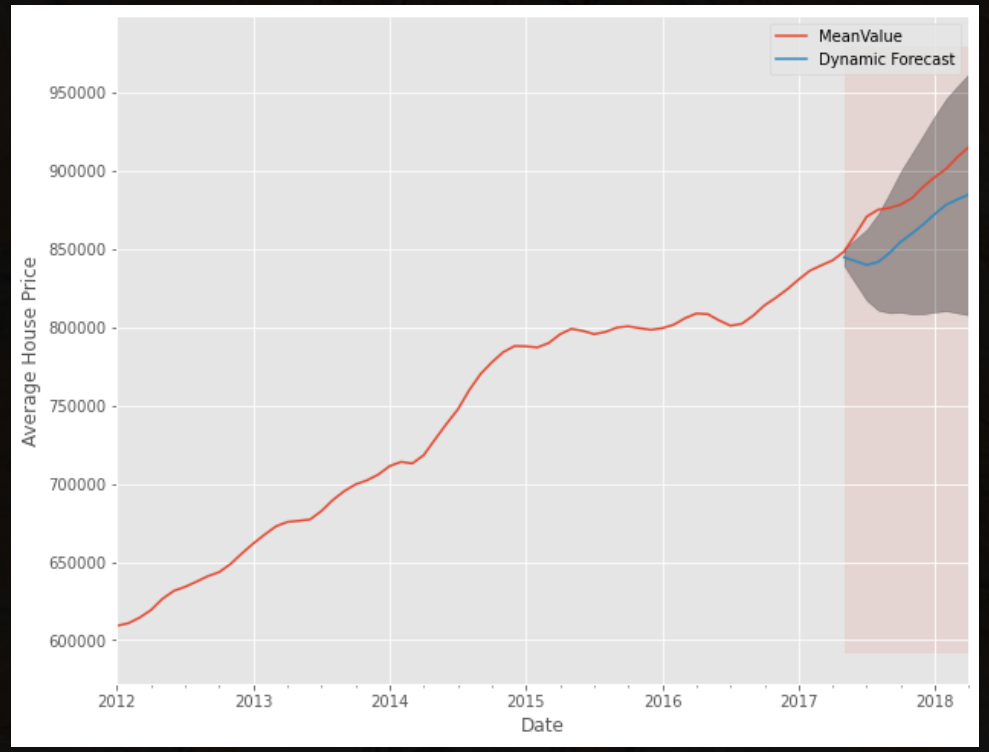




There is autocorrelation in the time series at several lags. Therefore, the time series is non-random.

There is also significant partial correlations which further continues to support that the series is not random

Dynamic Forecasting



ZIPCODE	Sqrt-MSE
11003	28,185
11040	5,941
11516	5,621
11577	12,685
11598	9,241

Top 5 Zip Codes with Highest 5yr ROI

Zip code	Current Value	5 Years Value	5 Years Lower	5 Years Upper	5Yr-ROI	5Yr-ROI-Lower	5Yr-ROI-Upper
11735	$ 467,900.00	$ 799,889.10	$ 139,954.37	$ 1,459,824.00	0.71	-0.70	2.12
11803	$ 880,000.00	$ 1,491,852.00	$ (428,918.05)	$ 3,412,622.00	0.70	-1.49	2.88
11598	$ 488,500.00	$ 786,229.50	$ 432,429.87	$ 1,140,029.00	0.61	-0.11	1.33
11003	$ 566,900.00	$ 910,321.40	$ 376,541.54	$ 1,444,101.00	0.61	-0.34	1.55
11552	$ 502,500.00	$ 798,562.20	$ 520,921.46	$ 1,076,203.00	0.59	0.04	1.14

Based on the 5 year ROL, the 5 zip codes that are the best to invest in Nassau County are 1. 11735 [Farmingdale], 2. 11803 [Plainview], 3. 11598 [Woodmere], 4. 11003 [Elmont], 5. 11552 [West Hempstead]

Future Considerations

- The methods we will employ in this project example will only take in data from a uni-variate time series. That means we really are only considering the relationship between the y-axis value the x-axis time points. We're not considering outside factors that may be effecting the time series.
- Build a linear model with additional features such as federal interest rate, housing grade score, etc.

Q&A