

Predicting Home Sale Prices

Objective

To forecast home sales in the Austin, TX area to determine the five best zip codes for investing in residential real estate.

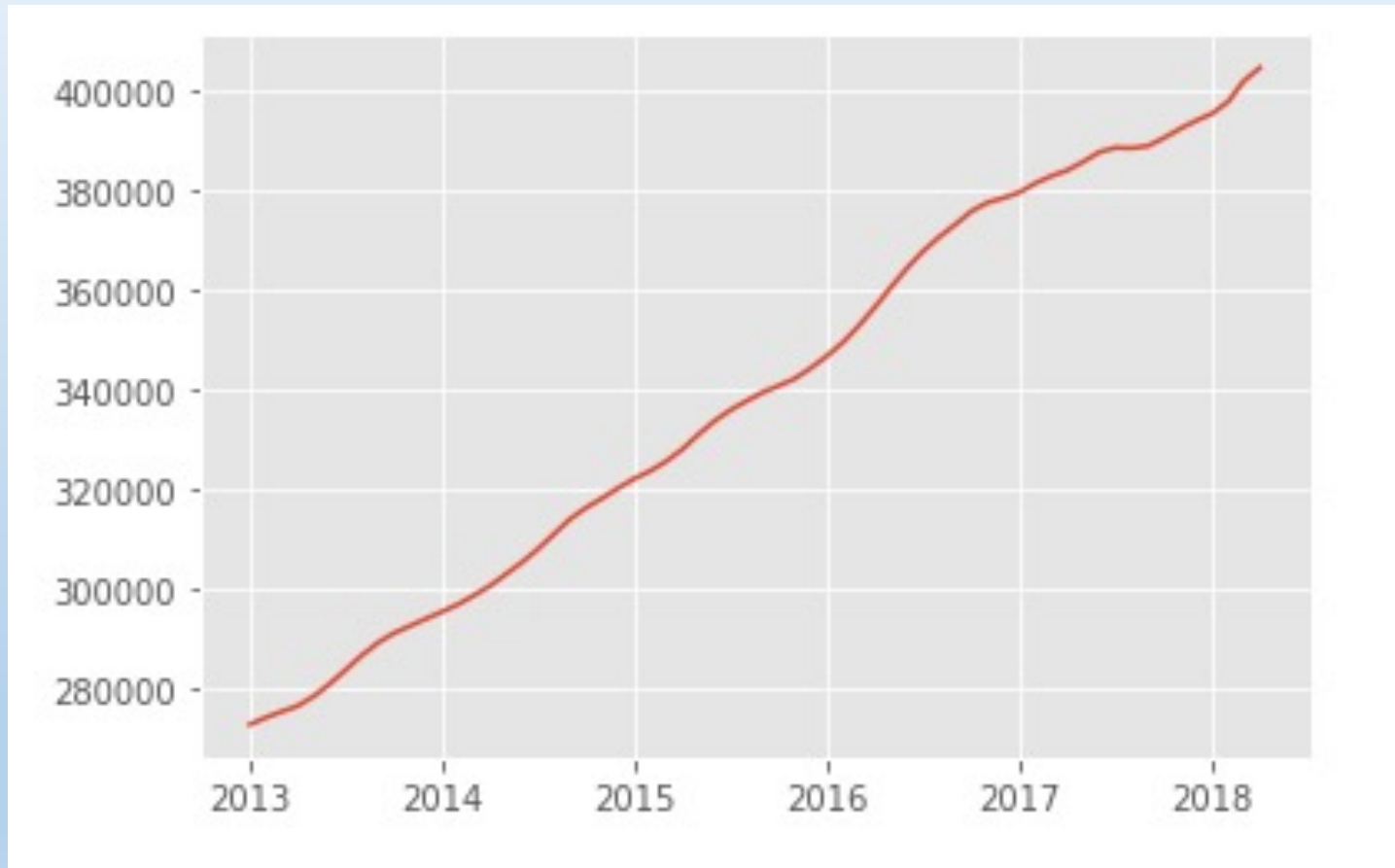
The Dataset

US home sales from 4/1996-4/2018 from Zillow.com. The dataset was narrowed to the 42 zip codes in the Austin, TX area.

To eliminate the effect of the 2008 housing crisis and focus on the recent upward trend in the Austin area, the dataset was further narrowed to 2013-2018.

The ten zip codes showing the greatest gain in home prices during that time were modeled.

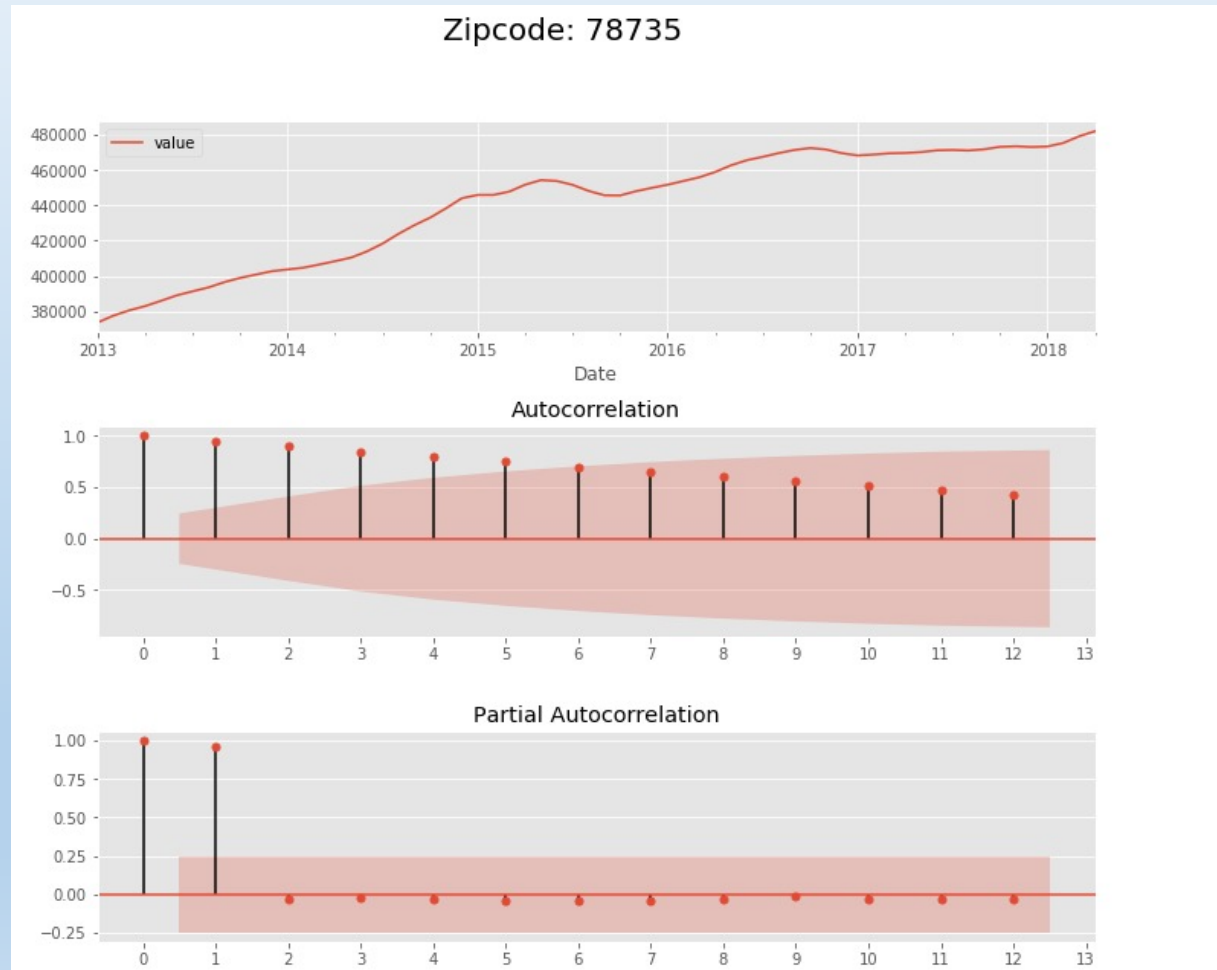
Monthly Mean of Home Sales



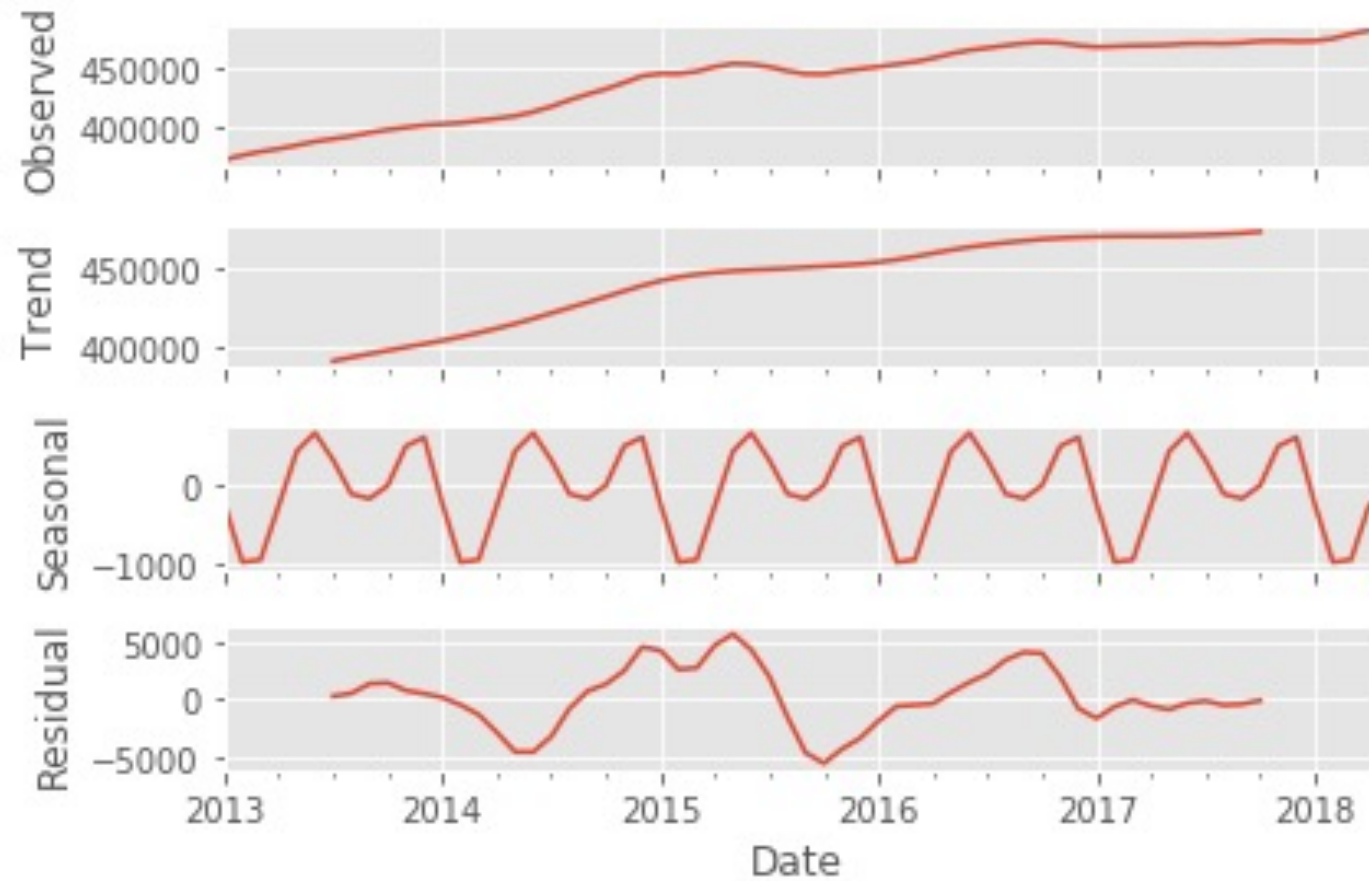
Time Series Model

The data for each zip code were detrended to remove autocorrelation and then modeled with ARIMA to predict sale prices for the next two years.

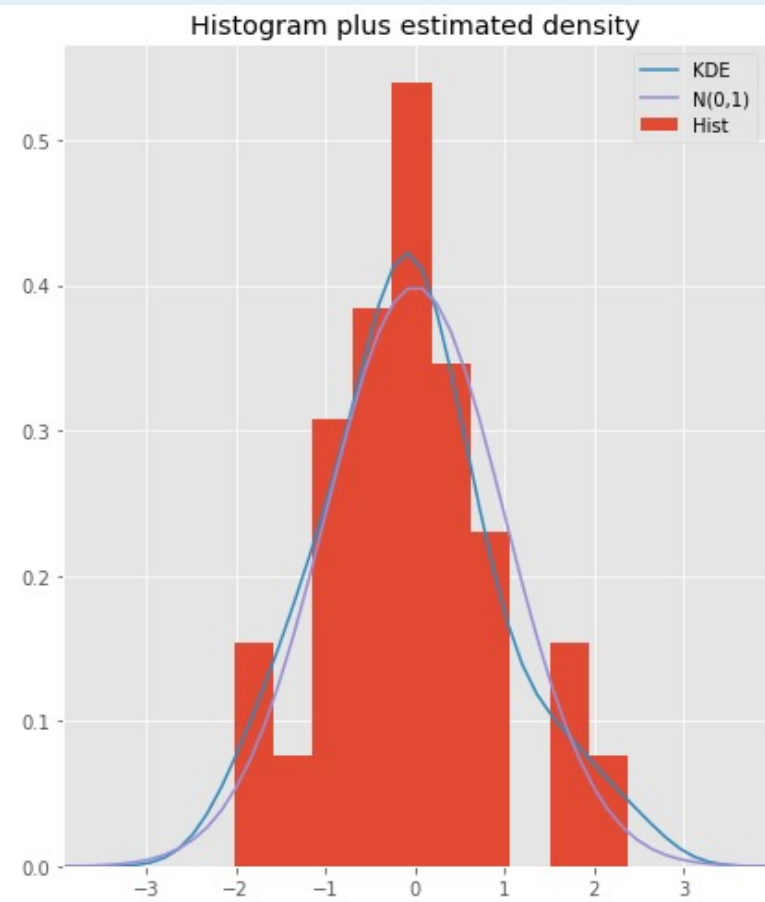
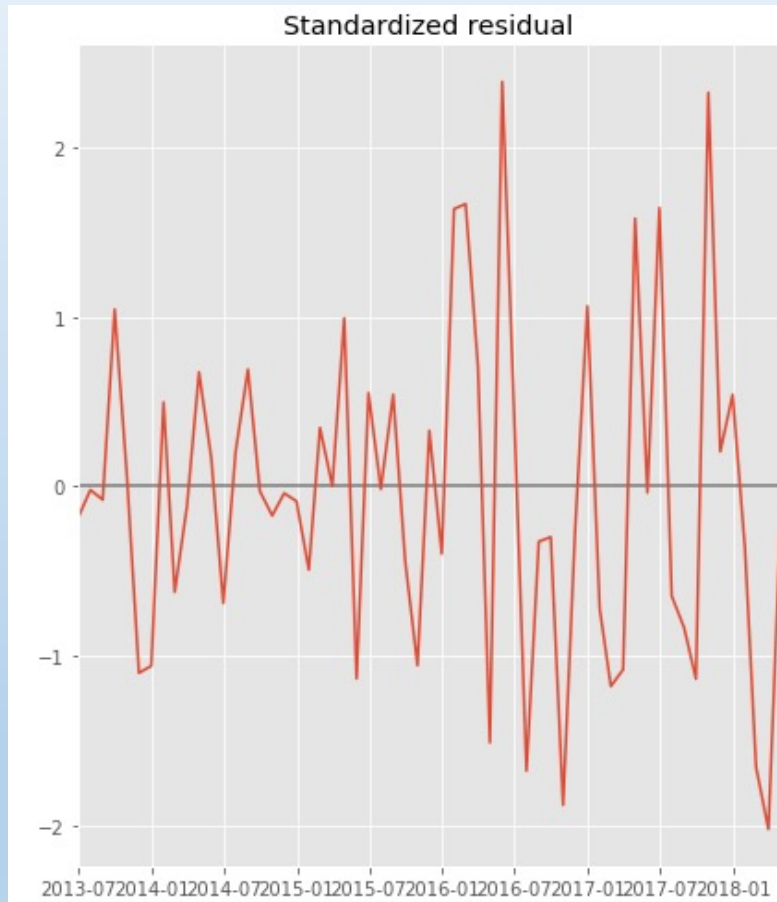
Before Detrending



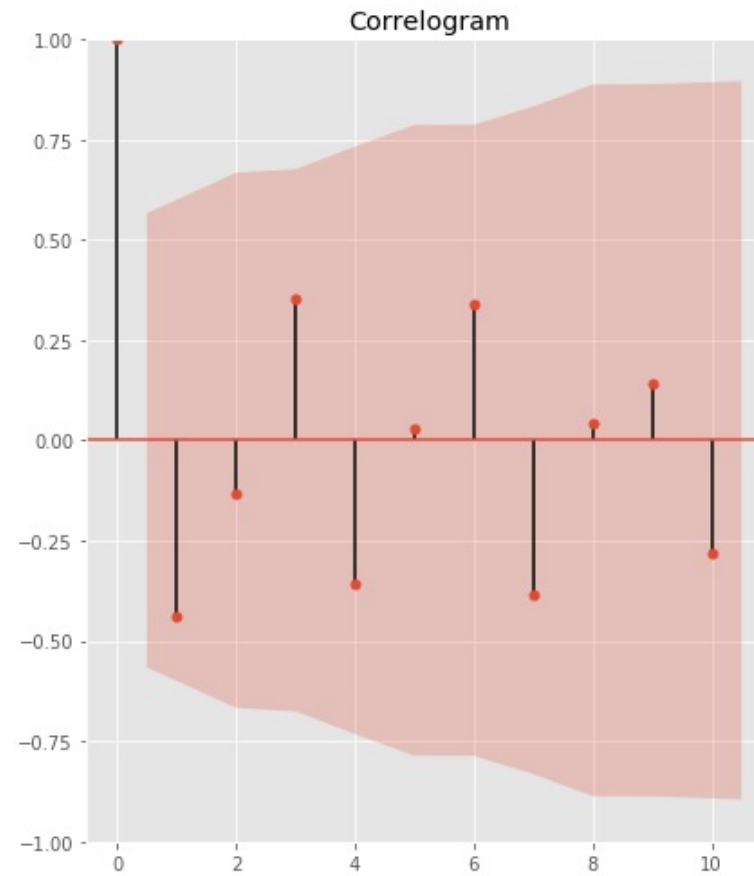
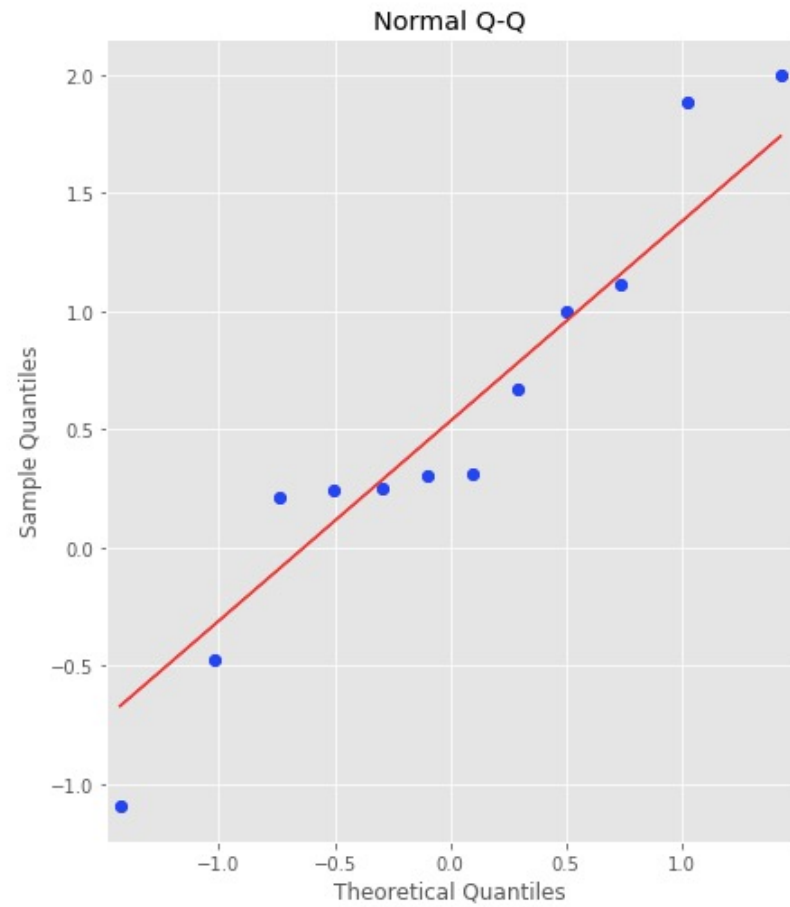
Decomposition



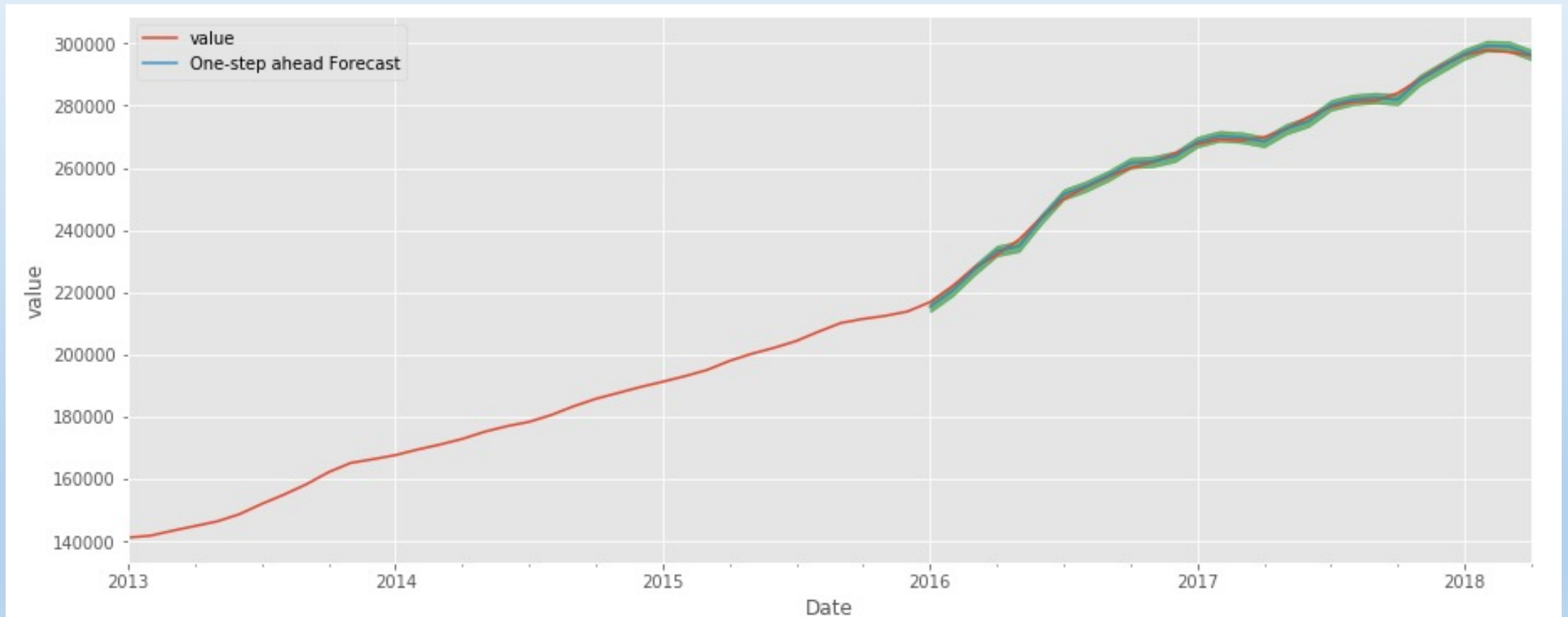
ARIMA Model



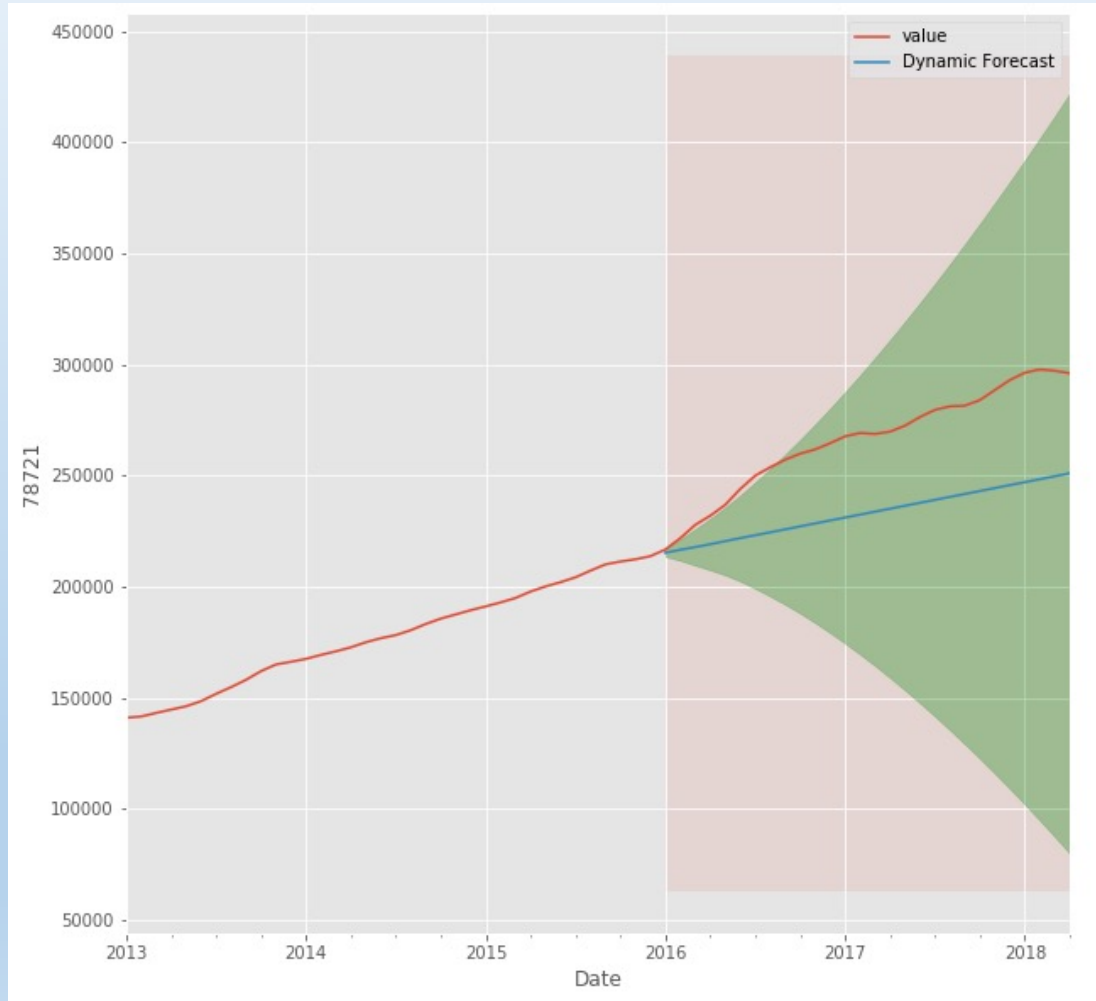
ARIMA Model



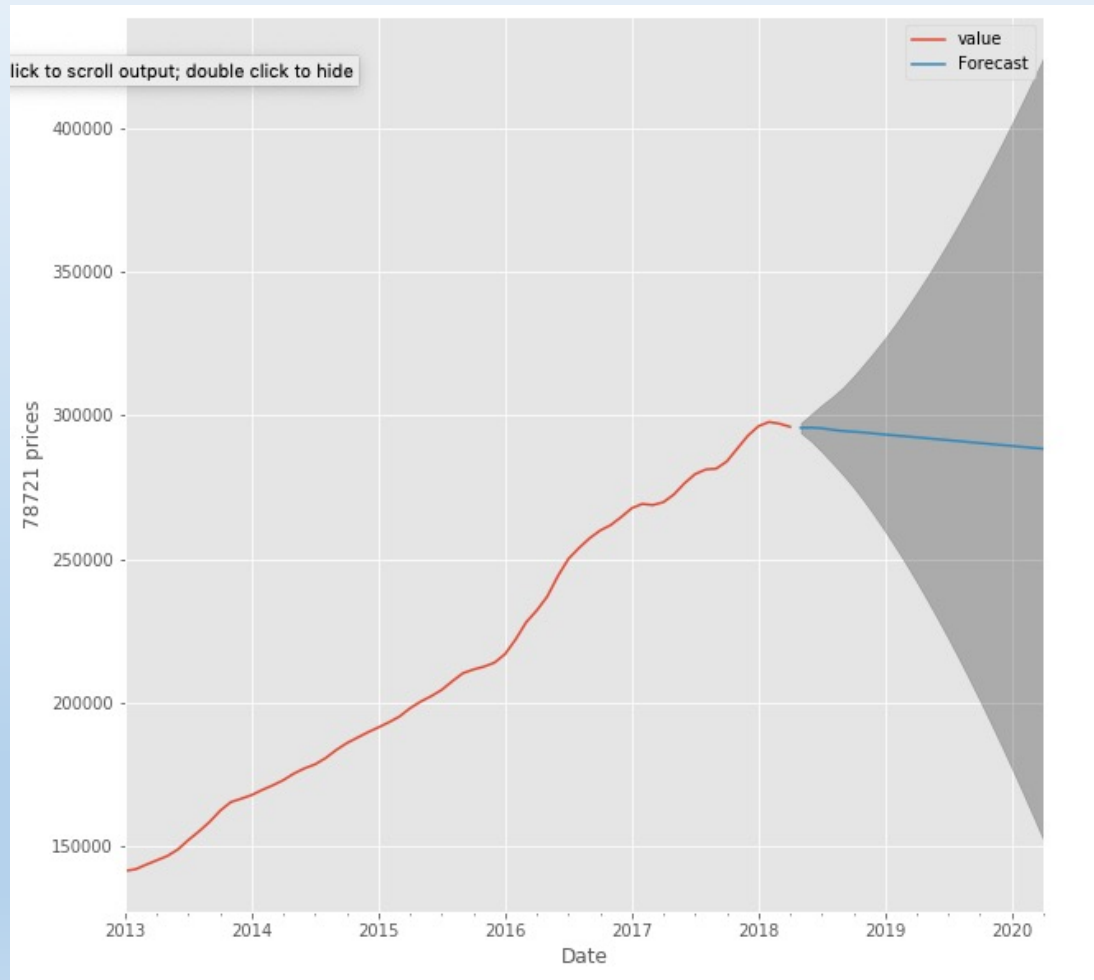
One Step Ahead Forecast



Dynamic Forecast



Future Predictions



ROI for All Ten Zip Codes

	zipcode	roi_2
4	78741.0	21.187219
1	78758.0	19.882925
5	78753.0	15.249987
2	78702.0	11.528812
7	78723.0	11.340899
3	78744.0	10.365843
8	78745.0	4.899813
9	78752.0	1.437872
6	78724.0	-0.928001
0	78702.0	-2.475796

Conclusion

The current model does not use a seasonality component due to the limited number of years we are focusing on.

The next step will be to rerun the model with data from more years using the seasonality component to improve predictions, which may change the recommended zip codes.