Name: Allan Flores
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Instructor: Dr. Jon Fox
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Laboratory Exercise 2

Recommend the Three Zip Codes to Invest

Introduction

Given the available resources to invest in real estate requires scrutiny of information and data. Some of the factors may include goals with the property, the real estate market, income stability, and life situation among other things. There are several uncertainties in the market but one can use his or her judgment by looking at historical data as one of the bases in making a decision.

The scope covers recommendation of the three zip codes for the Syracuse Real Estate Investment Trust (SREIT) based on the median home values from 1996 to 2019. Crime rates and median household income were taken into consideration in filtering the desirable zip codes for potential investments.

Years of historical data until 2019 will help up assess the trend over a period of time and generate a forecast for Y2020. Using the Prophet (fbprophet) model as forecasting technique will help us assess the best zip codes based on several assessment parameters.

Data Source

Three sets of data were used in delivering the requirements for this exercise.

- Zillow Median Home Values:
    o Data from files.zillowstatic.com/research/public/Zip/Zip_Zhvi_SingleFamilyResidence.csv"
- Median Household Income for Y2018:
    o Extracted manually from https://www.ers.usda.gov/data-products/county-level-data-sets/download-data/

- Crime Rates and Population:
  - Extracted from Kaggle with Y2016 crime rates by county in the United States. Title from Kaggle: "United States Crime Rate by County"

Transformation, Analysis and Model

Dealing with Missing Values, Cleaning and Transforming Data

- Zillow Data:
  - Dropped data from Apr 1996 to Dec 1996.
  - Added "Growth" rate column by taking the Dec 2019 data and dividing it by the Jan 1997 data.
  - Added "std" or standard deviation column by taking data for the past 10 years from Jan 2010 to Dec 2019.
  - Added "mean" column by taking data for the past 10 years from Jan 2010 to Dec 2019.
- Median Household Income for Y2018:
  - Retained only columns County Name, State and Median Income.
- Crime Rates:
  - Retained only columns County Name, State and Crime Rate Income.

Merging of Data

First merge:

- Merged Zillow and Crime Rate data frames joining through "County Name" and "State" columns.
- 746 observations were dropped from 30,434 to 29,688.

Second merge:

- Merged "First merge" with the Median Household Income joining through "County Name" and "State" columns.
- This time, 29,519 observations were left or only 169 observations were dropped from the first merge.

Further Cleaning Transformation After Merging Data

- Kept rows with at least 60% non-NA values, which resulted to 23,044 observations left.

- Removed rows with crime rates of more than 1.27% (taken from 25% quantile of Crime Rate data), which resulted to 3,954 observations.
- Removed rows with median income of at most $59,000 (taken from 75% quantile of Median Household Income data), which resulted to 1,151 observations.

Transformation After Choosing Top 10 Zip Codes

- Dates as columns had been reset as index.
- Re-assigned index as "ds" which is a requirement in using fbprophet.
- Converted new index to datetime.
- Re-assigned zip codes as "y."
- Generated fbprophet output **functions** (can be seen from Jupyter Notebook file) for the Top 10 Zip Codes

Exploratory Data Analysis

- **Top 20 Zip Codes from the original Zillow data (prior to merging) based on highest growth rate calculated.**

From the top 20 zip codes nationwide based on growth rates, majority of the zip code were all out of California and only 1 few from New York.
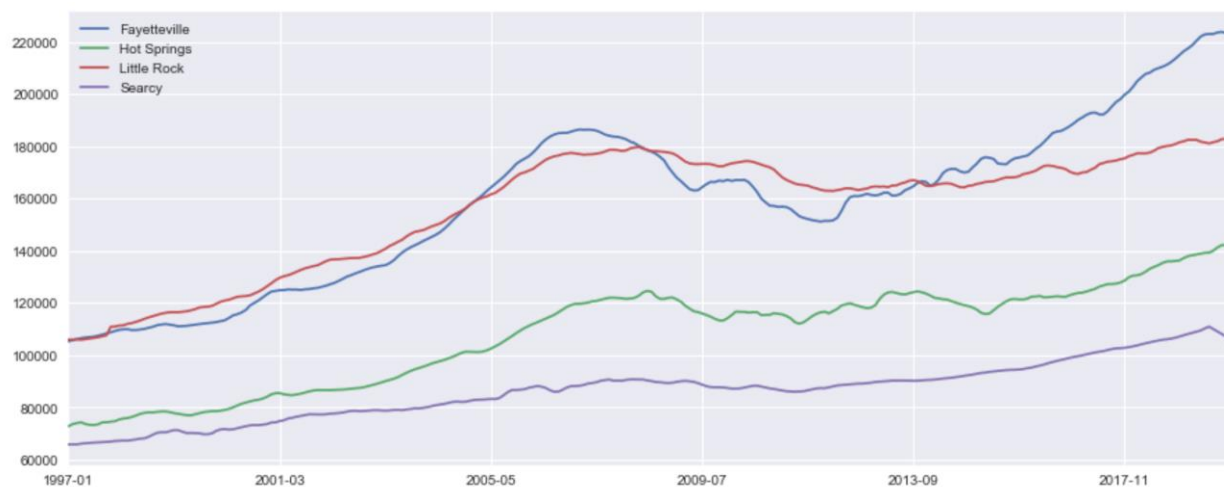
Best 20 Zipcodes:

	RegionName	Metro	CountyName	City	State	Growth	mean	std
2331	90403	Los Angeles-Long Beach-Anaheim	Los Angeles County	Santa Monica	CA	13.914982	1.092774e+06	518560.866240
9350	91108	Los Angeles-Long Beach-Anaheim	Los Angeles County	San Marino	CA	13.776618	9.497870e+05	470036.233530
9981	90211	Los Angeles-Long Beach-Anaheim	Los Angeles County	Beverly Hills	CA	12.554974	9.871943e+05	494881.970778
1088	90020	Los Angeles-Long Beach-Anaheim	Los Angeles County	Los Angeles	CA	12.272559	1.488784e+06	635028.946798
331	90027	Los Angeles-Long Beach-Anaheim	Los Angeles County	Los Angeles	CA	11.977903	7.680990e+05	335516.443857
253	90004	Los Angeles-Long Beach-Anaheim	Los Angeles County	Los Angeles	CA	11.318958	7.775213e+05	338011.493077
2251	90266	Los Angeles-Long Beach-Anaheim	Los Angeles County	Manhattan Beach	CA	10.948580	1.071792e+06	507941.211850
2733	90048	Los Angeles-Long Beach-Anaheim	Los Angeles County	Los Angeles	CA	10.497167	9.961686e+05	406054.897367
1626	94610	San Francisco-Oakland-Hayward	Alameda County	Oakland	CA	10.286459	8.363412e+05	401629.738911
4468	91030	Los Angeles-Long Beach-Anaheim	Los Angeles County	South Pasadena	CA	10.195877	6.273837e+05	268614.706156
2106	90069	Los Angeles-Long Beach-Anaheim	Los Angeles County	West Hollywood	CA	9.604911	1.297958e+06	533324.387651
7396	90212	Los Angeles-Long Beach-Anaheim	Los Angeles County	Beverly Hills	CA	9.271800	1.453807e+06	614666.562734
43	90046	Los Angeles-Long Beach-Anaheim	Los Angeles County	Los Angeles	CA	9.170598	9.438518e+05	372731.539802
1307	90005	Los Angeles-Long Beach-Anaheim	Los Angeles County	Los Angeles	CA	9.067142	8.978202e+05	344777.433684
589	90036	Los Angeles-Long Beach-Anaheim	Los Angeles County	Los Angeles	CA	8.657940	9.829735e+05	378354.297132
2032	90291	Los Angeles-Long Beach-Anaheim	Los Angeles County	Los Angeles	CA	8.409081	1.038788e+06	412799.270720
514	11216	New York-Newark-Jersey City	Kings County	New York	NY	8.332922	1.047424e+06	381081.572991
2814	90068	Los Angeles-Long Beach-Anaheim	Los Angeles County	Los Angeles	CA	8.272667	8.431533e+05	319368.055118
5310	90210	Los Angeles-Long Beach-Anaheim	Los Angeles County	Beverly Hills	CA	8.216722	2.298412e+06	868016.499644
8143	90401	Los Angeles-Long Beach-Anaheim	Los Angeles County	Santa Monica	CA	8.152619	1.228189e+06	414800.255759

- **Time Series plot for Hot Springs, Little Rock, Fayetteville, and Searcy in Arkansas.**

From the 4 cities, highest in terms of growth rate were Fayetteville and Hot Springs with 113% and 99.7% respectively. Growth rate was calculated by dividing the Dec 2019 median household value to Jan 1997. This is simply saying that the values almost doubled from Y1997 to Y2019. Little Rock and Searcy almost grew by 50%.

In terms of standard deviation however, Fayetteville has the highest among the 4 cities. The remaining 3 have standard deviation that is close to each other. This means that the values of Fayetteville are more spread out as compared to the rest.

Fayetteville from the graph below showed significant increase in trend around years 2005 and 2007, and after year 2017. There was decline in trend however around years 2009 and 2013 making the median home value of Little Rock overtake Fayetteville.

Best Zipcodes:

City	Growth	std	mean
Fayetteville	1.130409	21893.753876	179309.294444
Hot Springs	0.996877	7905.089083	123511.337500
Little Rock	0.638650	7509.868394	170605.392308
Searcy	0.557487	7454.500756	95253.145833

- **Top 10 Zip Codes from the final data frame after merging all the data sorting from the highest growth rate.**

From the top 10 zip codes nationwide based on growth rates, 3 came out of Minnesota, 2 from Oregon, 2 from Colorado, 1 from Washington, 1 from Virginia, and 1 from Idaho .

Top 3 in terms of growth rates were Underwood, WA, Winter Park, CO and Delaplane, VA, which grew by around 250% from Jan 2017 to Dec 2019. The rest of the cities grew by about 213% to 235%, that were not far behind from the first 3 zip codes. In terms of standard deviation, you will see the highest coming from Winter Park, CO with a steady upward trend from Y2011 onwards.
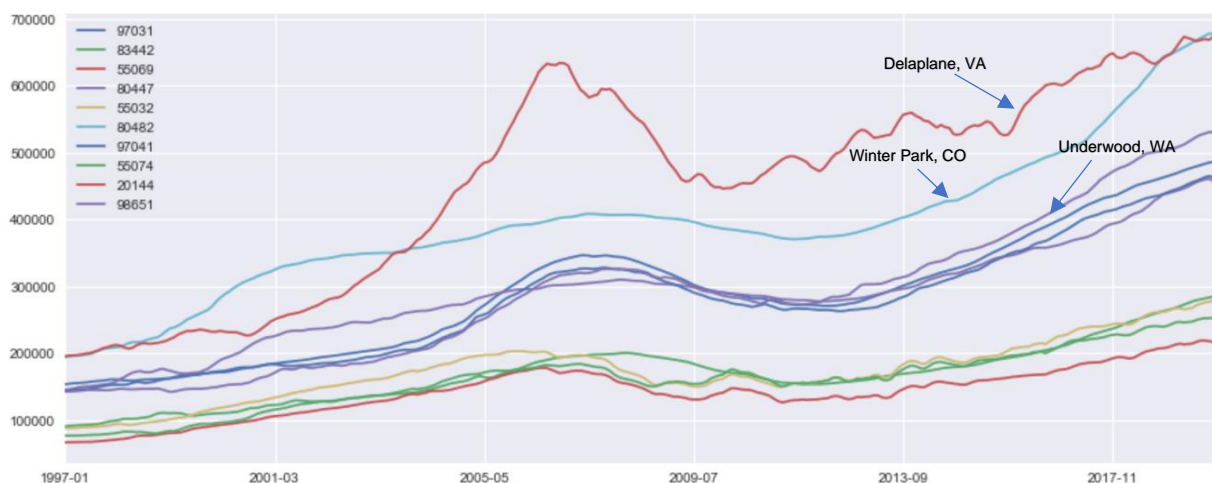
Delaplane, VA had huge a growth around Y2007 with a sudden decline from that year until Y2009. Its median house price started to go back up to its Y2007 prices in Y2018 showing signs of recovery.

From the top 10 zip codes, median house prices of the top 3 as of Dec 2019 are as follows:

Delaplane, VA   - $676,899
Winter Park, CO   - $676,089
Underwood, WA   - $531,379

Best 10 Zipcodes:

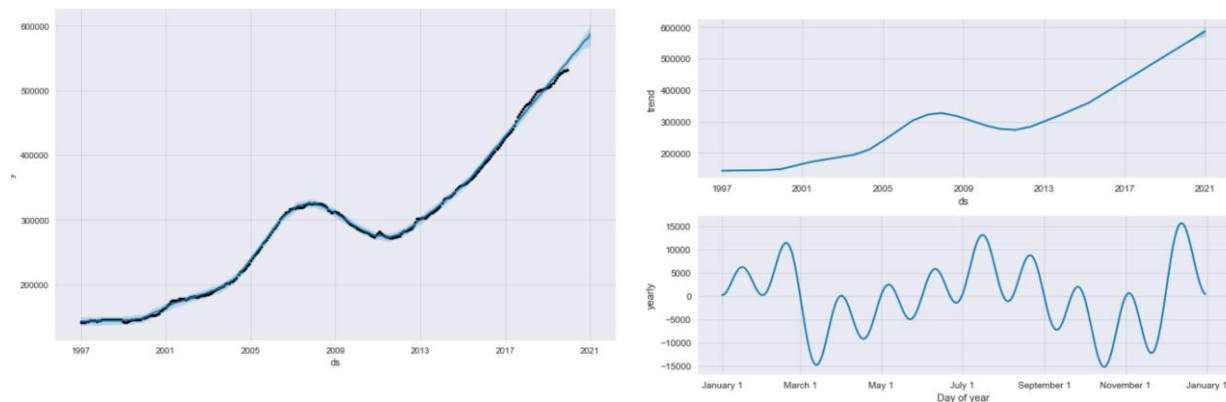|	RegionName	Metro	CountyName	City	State	Growth	std	mean
28245	98651	Portland-Vancouver-Hillsboro	Skamania County	Underwood	WA	2.744479	86548.903408	372800.925000
27363	80482	NaN	Grand County	Winter Park	CO	2.490861	98718.041136	470620.433333
20006	20144	Washington-Arlington-Alexandria	Fauquier County	Delaplane	VA	2.468982	68402.012014	558770.791667
21239	55074	Minneapolis-St. Paul-Bloomington	Chisago County	Shafer	MN	2.353474	31500.079045	193209.441667
21237	55069	Minneapolis-St. Paul-Bloomington	Chisago County	Rush City	MN	2.310456	28099.555029	163006.958333
17861	97041	Hood River	Hood River County	Mount Hood Parkdale	OR	2.230471	68928.748286	338221.266667
21238	55032	Minneapolis-St. Paul-Bloomington	Chisago County	Harris	MN	2.214750	40093.706509	201372.283333
19144	83442	Idaho Falls	Jefferson County	Rigby	ID	2.179051	40767.972766	197067.866667
17860	97031	Hood River	Hood River County	Hood River	OR	2.175693	73846.796956	353977.675000
27362	80447	NaN	Grand County	Grand Lake	CO	2.130602	58312.946847	339919.325000

Models

Showing results from running the fbprophet of top 3 zip codes based on highest growth rates from Jan 1997 to Dec 2019. (***Note: Results from the remaining zip codes can be found from the Jupyter Notebook file attached to this homework.***)
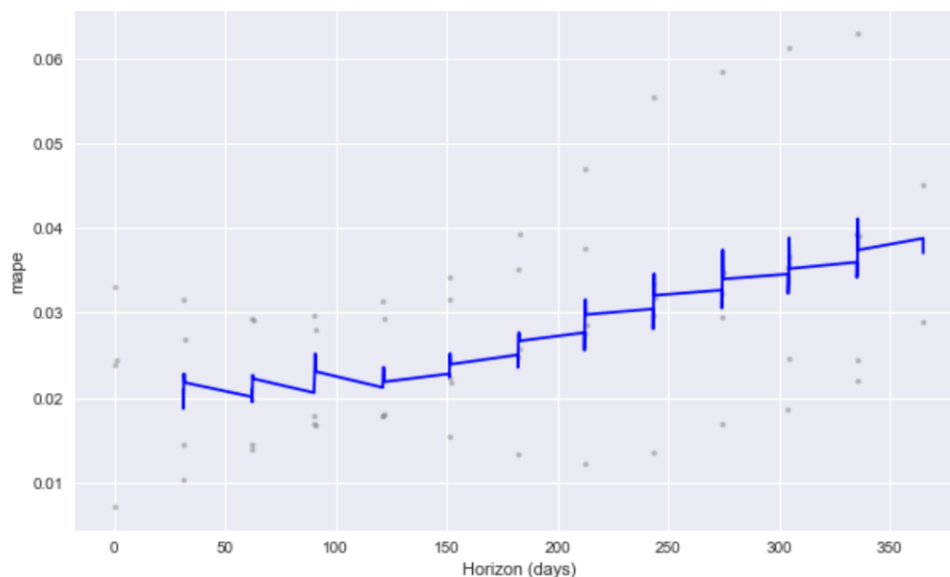
- **Zip Code 98651 – Underwood, Washington**

Underwood, WA has the highest growth rate of 274% from Jan 1997 to Dec 2019 among the top 10 zip codes with a median house value of $530K as of Dec 2019. It has a consistent upward trend since Y2011. Year round, high periods are around Feb, Jul and Dec, while noticeable low periods around Mar and Oct.

We used 12 months or 365 days as horizon in predicting performance, and 204 months prior as training data. Picking on MAPE over 365 days horizon, we see that forecast error range is from 2% to 4% (see graph below). Forecast errors are around 2% for predictions 180 days into the future and increases up to around 4% for predictions that are a year out.
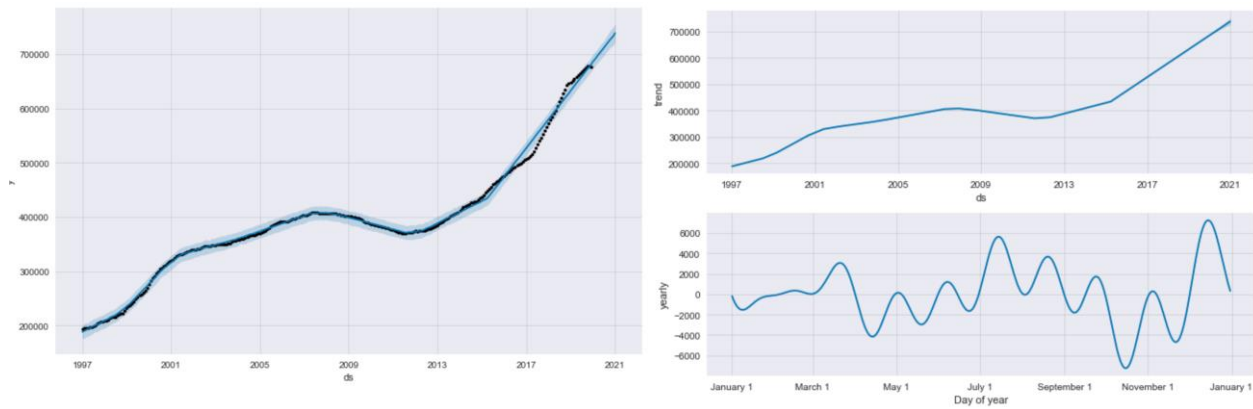

	ds	yhat	yhat_lower	yhat_upper	y	cutoff
56	2019-08-01	533502.526978	523736.314710	543212.760482	526417.0	2018-11-30 18:10:48
57	2019-09-01	537235.067388	523737.982148	548823.628472	528292.0	2018-11-30 18:10:48
58	2019-10-01	540395.846503	527140.421188	554380.584718	530505.0	2018-11-30 18:10:48
59	2019-11-01	543494.384655	528603.650966	558769.324796	530538.0	2018-11-30 18:10:48
60	2019-12-01	546731.548894	529050.516801	563548.822475	531379.0	2018-11-30 18:10:48

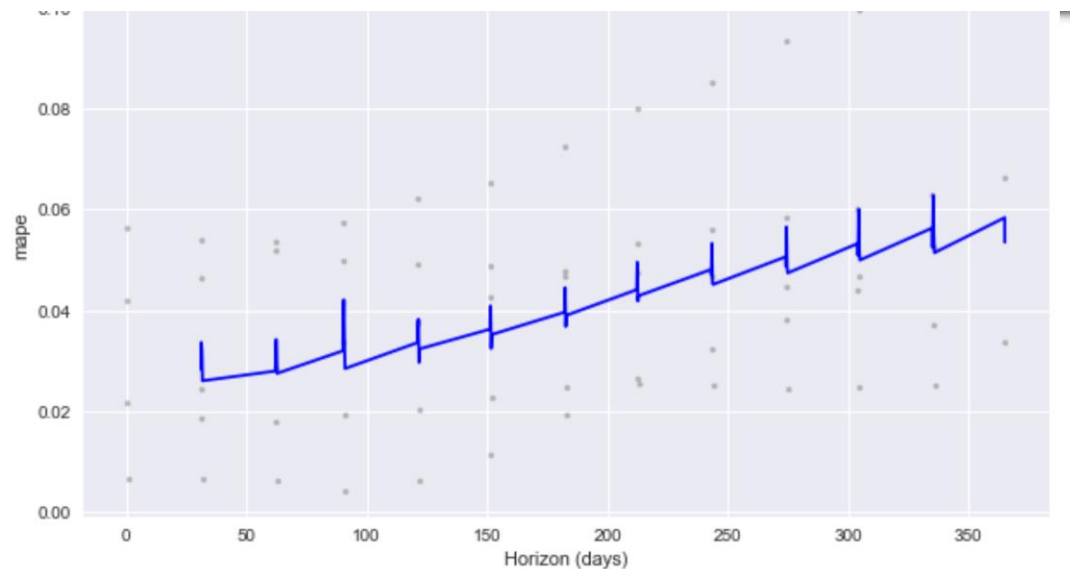|	horizon	mse	rmse	mae	mape	coverage
51	335 days 11:38:24	2.863520e+08	16921.937481	15869.767799	0.034731	0.333333
52	335 days 17:27:36	4.074279e+08	20184.843148	18753.191081	0.041110	0.333333
53	335 days 23:16:48	3.158582e+08	17772.398982	16717.753430	0.037412	0.333333
54	365 days 05:06:00	3.265047e+08	18069.441587	17044.923431	0.038793	0.333333
55	365 days 05:49:12	3.286059e+08	18127.490687	17114.295436	0.037053	0.500000

- **Zip Code 80482 – Winter Park, Colorado**

Winter Park, CO has the second highest growth rate of 249% from Jan 1997 to Dec 2019 among the top 10 zip codes with a median house value of $676K as of Dec 2019. It has a consistent upward trend since Y2011. Year round, high periods are around Apr, Jul and Dec, while noticeable low period is Oct.

We used 12 months or 365 days as horizon in predicting performance, and 204 months prior as training data. Picking on MAPE over 365 days horizon, we see that forecast error range is from 2% to 6% (see graph below). Forecast errors are around 2% for predictions 90 days into the future and increases up to around 6% for predictions that are a year out.
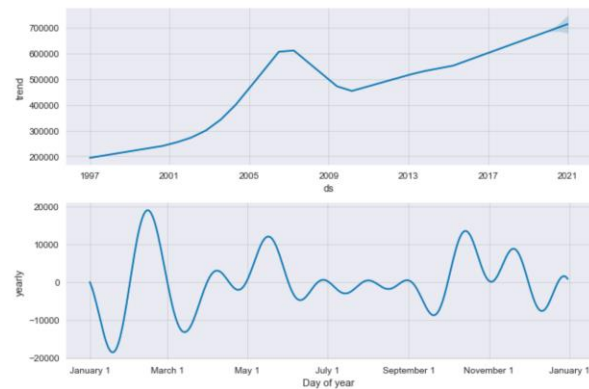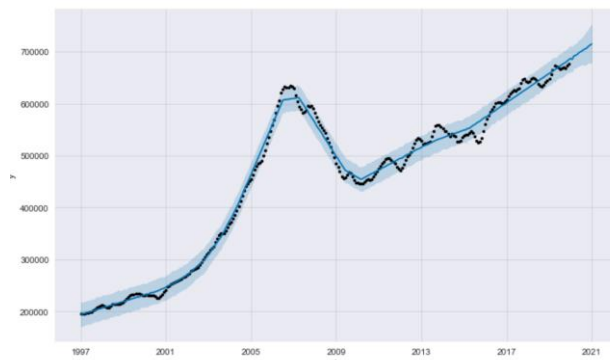

	ds	yhat	yhat_lower	yhat_upper	y	cutoff
0	2014-12-01	424874.507160	418481.350884	430843.025805	434337.0	2014-11-30 18:54:00
1	2015-01-01	426543.389128	420424.112313	432886.951309	437197.0	2014-11-30 18:54:00
2	2015-02-01	427855.150429	421140.644285	434076.387339	440469.0	2014-11-30 18:54:00
3	2015-03-01	429795.590568	422962.756706	437022.312580	444700.0	2014-11-30 18:54:00
4	2015-04-01	431506.223641	424366.774663	437794.617594	448256.0	2014-11-30 18:54:00

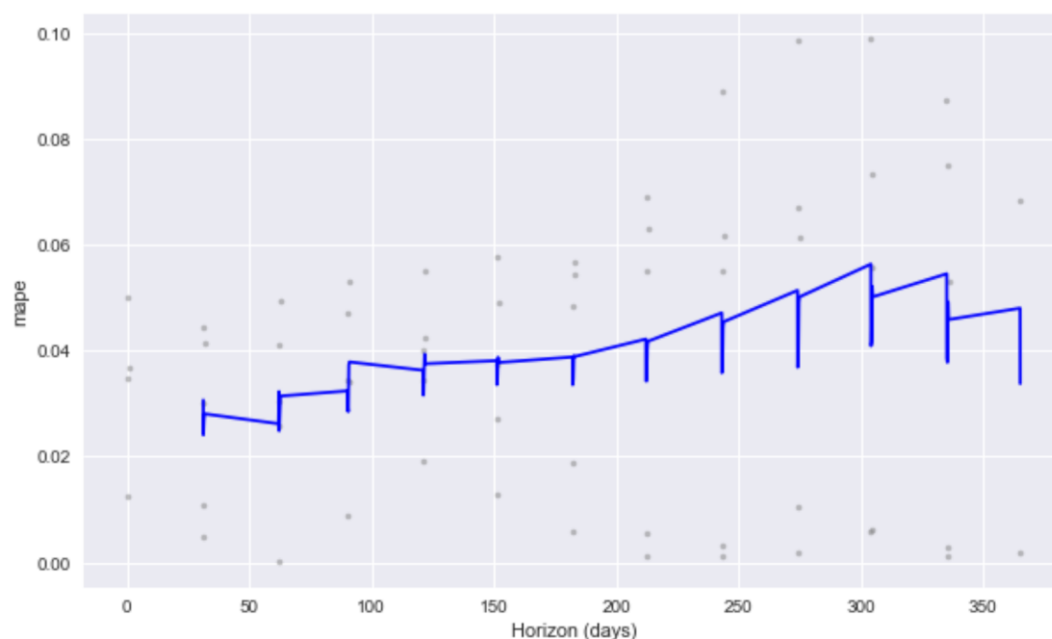|	horizon	mse	rmse	mae	mape	coverage
0	31 days 05:06:00	3.643543e+08	19088.065695	15400.092655	0.028253	0.000000
1	31 days 05:49:12	5.522473e+08	23499.941867	19637.018660	0.033589	0.000000
2	31 days 11:38:24	4.473150e+08	21149.823088	17970.094349	0.031892	0.000000
3	31 days 17:27:36	3.550155e+08	18841.854974	14559.646185	0.025980	0.166667
4	61 days 23:16:48	3.656908e+08	19123.043030	15457.662150	0.027912	0.166667

Zip Code 20144 – Delaplane, Virginia

Delaplane, VA has the third highest growth rate of 247% from Jan 1997 to Dec 2019 among the top 10 zip codes with a median house value of $676K as of Dec 2019, which is almost the same as Winter Park, CO. It has a consistent upward trend since Y2011. Its current median house value in now catching up from its price in Y2007. Year round, high periods are around Feb, May and Oct, while noticeable low periods around Jan and Mar.

We used 12 months or 365 days as horizon in predicting performance, and 204 months prior as training data. Picking on MAPE over 365 days horizon, we see that forecast error range is from 2% to 5% (see graph below). Forecast errors are around 2% for predictions 90 days into the future and increases up to around 5% for predictions that are a year out.

	ds	yhat	yhat_lower	yhat_upper	y	cutoff
0	2014-12-01	561626.948008	542486.862877	580282.362101	534826.0	2014-11-30 18:54:00
1	2015-01-01	562458.261462	542766.983329	584241.395284	538492.0	2014-11-30 18:54:00
2	2015-02-01	562764.510534	543452.465853	582766.986635	540532.0	2014-11-30 18:54:00
3	2015-03-01	564931.934448	544954.864604	583340.937603	539476.0	2014-11-30 18:54:00
4	2015-04-01	564896.899305	543406.004168	585183.387333	543155.0	2014-11-30 18:54:00

	horizon	mse	rmse	mae	mape	coverage
0	31 days 05:06:00	3.944337e+08	19860.355141	17723.098626	0.030646	0.500000
1	31 days 05:49:12	2.828553e+08	16818.302376	14420.799909	0.024092	0.666667
2	31 days 11:38:24	3.337920e+08	18269.974526	16276.021020	0.026997	0.666667
3	31 days 17:27:36	3.551176e+08	18844.563360	16724.529851	0.028062	0.500000
4	61 days 23:16:48	3.081758e+08	17554.937639	15454.866129	0.026198	0.666667

Results / Answers to Questions

1. Technique/algorithm/decision process used to down sample.

- Dropped Y1996 data.
- Merged data frames of Zillow, Crime Rate and Median Household Income.
- Keep only the rows with at least 60% non-NA Values.
- Removed rows with crime rate of at least 1.27%.
- Removed rows with median household income of at most $59,000.
- Generated the Top 10 zip codes based on highest growth rates from Jan 1997 to Dec 2019.

2. 12 months forecast in Y2020 of the top 10 zip codes?

Out of the top 10 zip codes, 98651-Underwood, WA showed the highest growth from Dec 2019 to Dec 2020 of 10.4% (Fig 3 below). Underwood was consistent with its performance with the highest growth rate from Jan 1997 to Dec 2019 of 274%.

And for the other 2 zip codes amongst the top 3 based on growth rates from Jan 1997 to Dec 2019, 80482-Winter Park, CO ranked 4th (Fig. 1) in terms of growth rate from Dec 2019 to Dec 2020 of 9.2%, while 20144-Delaplane, VA ranked 9th with only 5.6%.

The slowing down of growth in Delaplane, VA may have been affected by its peak around Y2007 and sudden decline thereafter. Its current median household value as of Dec 2019 have caught up with its value in Y2007 in which 80482-Winter Park, CO has overtaken in Dec 2019 (Fig. 2).

In terms of absolute value change from Dec 2019 to Dec 2020, 80482-Winter Park, CO has the highest with $62K followed by 98651-Underwood, WA of $55K and 97031-Hood River, CO of $47K.

Fig. 1 Growth rates comparison from Dec 2019 to Dec 2020.

Zip Code	City	State	Dec 2019 House Value	Dec 2020 House Value	Difference Bet Dec '20 and '19	Dec 2020 / Dec 2019
98651	Underwood	WA	531,379	586,556	55,177	10.4%
97031	Hood River	OR	485,881	532,895	47,014	9.7%
97041	Mount Hood Parkdale	OR	461,224	505,026	43,802	9.5%
80482	Winter Park	CO	676,089	738,575	62,486	9.2%
83442	Rigby	ID	285,927	308,679	22,752	8.0%
80447	Grand Lake	CO	453,762	489,527	35,765	7.9%
55069	Rush City	MN	218,596	233,334	14,738	6.7%
55032	Harris	MN	280,712	298,030	17,318	6.2%
20144	Delaplane	VA	676,899	714,669	37,770	5.6%
55074	Shafer	MN	255,025	269,062	14,037	5.5%

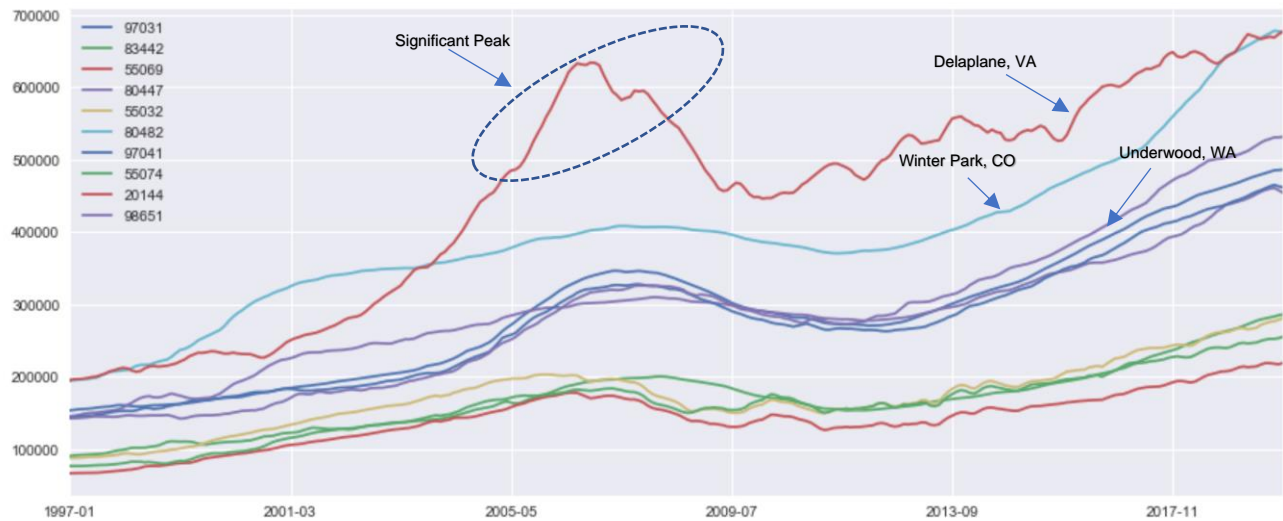Fig. 2 Top 10 Historical Value Graph from Y1997 to Y2019.

Fig 3. Y2020 Forecast

	RegionID	RegionName	City	State	Metro	CountyName	SizeRank	2020-01-31 00:00:00	2020-02-29 00:00:00	2020-03-31 00:00:00	2020-04-30 00:00:00	2020-05-31 00:00:00	2020-06-30 00:00:00	2020-07-31 00:00:00	2020-08-31 00:00:00	2020-09-30 00:00:00	2020-10-31 00:00:00	2020-11-30 00:00:00	2020-12-31 00:00:00
0	99945	98651	Underwood	WA	Portland-Vancouver-Hillsboro	Skamania County	22693	550465.839292	554613.452136	556657.632906	559471.671146	562697.056226	566112.211199	570211.351249	573733.514426	576668.900097	579026.281911	581424.974755	586556.431486
1	93426	80482	Winter Park	CO	NaN	Grand County	15679	689779.459710	694135.172726	698922.658280	702956.013191	707318.989494	711743.653492	716446.360678	720876.079826	725208.074245	729089.177895	732956.831768	738574.654143
2	66240	20144	Delaplane	VA	Washington-Arlington-Alexandria	Fauquier County	21925	685138.293561	691919.380750	692702.053607	695173.754188	698467.065996	700223.813282	702630.362966	705082.883795	706304.316284	709871.948399	712540.598814	714668.616186
3	82086	55074	Shafer	MN	Minneapolis-St. Paul-Bloomington	Chisago County	18169	253644.389618	261040.599440	259784.187747	259824.632097	260611.483007	262572.080797	264362.978651	266035.283981	266586.858648	267875.250199	268627.017393	269061.847659
4	82081	55069	Rush City	MN	Minneapolis-St. Paul-Bloomington	Chisago County	13351	220876.228446	223862.517907	223666.274623	224345.992793	225507.526766	226998.445746	228521.447644	229549.912176	230176.347038	231217.449718	232398.893273	233334.415774
5	99045	97041	Mount Hood Parkdale	OR	Hood River	Hood River County	16248	477589.348369	480517.481019	482175.760356	484825.573570	487422.636823	489699.960108	492217.507002	494930.222586	497925.399060	499571.552676	501413.068684	505025.898556
6	82054	55032	Harris	MN	Minneapolis-St. Paul-Bloomington	Chisago County	15468	281124.910376	285782.638594	285653.663524	286500.297804	287871.357950	289983.973696	291640.722191	293396.941744	294355.922160	296227.402535	297371.514815	298030.419328
7	94167	83442	Rigby	ID	Idaho Falls	Jefferson County	7026	286738.623632	291583.112442	292880.659279	294462.300396	296143.176269	297874.920680	299924.480341	301740.035814	304034.004847	305957.179289	307473.471303	308678.650782
8	99035	97031	Hood River	OR	Hood River	Hood River County	6089	503689.527147	506212.603894	508566.346205	511194.249697	513880.963397	516268.432733	519214.594308	522103.506542	524838.168356	526751.249552	528414.617633	532895.092976
9	93397	80447	Grand Lake	CO	NaN	Grand County	15011	464184.261973	465433.301542	467910.507183	470317.422630	472697.810458	475298.631884	477641.467928	480002.061732	482430.410167	484356.383973	486151.065435	489527.122803

3. Summary of results of the top 10 Zip Codes and selection of final top 3.

From the top 3 zip codes (98651-Underwood, WA, 80482-Winter Park, 20144-CO and Delaplane, VA) based on growth rates from Jan 2017 to Dec 2019. The 2 zip codes from these that remained in the top 3 were 98651-Underwood, WA and 80482-Winter Park, CO of 10.4% and 9.2% growth rates from Dec 2019 to Dec 2020, respectively; while 20144-Delaplane, VA ended up with 5.6%.

The new zip code replacing Delaplane, VA is 97031-Hood River, OR with a growth rate of 9.7%, although Mount Hood Parkdale, OR came close at 9.5%. Hood River came up with a lower MAPE range of 2% to 4% as compared with Mount Hood Parkdale, OR of 2% to 5%.

Moreover, in terms of absolute value change, the combination of Underwood, WA, Winter Park, CO and Hood River, OR resulted to $165K (55,177 + 62,486 + 47014) increase in value from Dec 2019 to Dec 2020. This is equivalent to about 9.75% ($165/$1,693 * 100) ROI in a year's time.

Choosing Mount Hood Parkdale, OR instead of Hood River, OR can come close to the numbers above, which can be another option.

Zip Code	City	State	Growth	STD	MEAN	MAPE	Dec 2019 House Value	Dec 2020 House Value	Difference Bet Dec '20 and '19	Dec 2020 / Dec 2019
98651	Underwood	WA	274%	86,549	372,801	2% - 4%	531,379	586,556	55,177	10.4%
80482	Winter Park	CO	249%	98,718	470,620	2% - 6%	676,089	738,575	62,486	9.2%
20144	Delaplane	VA	247%	68,402	558,771	2% - 5%	676,899	714,669	37,770	5.6%
55074	Shafer	MN	235%	31,500	193,209	1.5% - 3.5%	255,025	269,062	14,037	5.5%
55069	Rush City	MN	231%	28,100	163,007	1.5% - 3.5%	218,596	233,334	14,738	6.7%
97041	Mount Hood Parkdale	OR	223%	68,929	338,221	2% - 5%	461,224	505,026	43,802	9.5%
55032	Harris	MN	221%	40,094	201,372	1.5% - 3.5%	280,712	298,030	17,318	6.2%
83442	Rigby	ID	218%	40,768	197,068	3% - 5%	285,927	308,679	22,752	8.0%
97031	Hood River	OR	218%	73,847	353,978	2% - 4%	485,881	532,895	47,014	9.7%
80447	Grand Lake	CO	213%	58,313	339,919	2% - 4%	453,762	489,527	35,765	7.9%

Conclusion

Out of the Top 20 zip codes generated from the original Zillow data prior to down sampling, most of the zip codes or cities were coming from California. None of these cities came out from the final Top 10 zip codes as result of the down sizing process as explained in the aforementioned (refer to Results #1). This was mainly due to the effects of crime rates and median household income criteria. Also worth mentioning that none of the selected Arkansas metro areas made it to the final Top 10 zip codes.

Using fbprophet as forecasting algorithm helped us use the outputs in determining the forecast in the next 12 months of Y2020. Main considerations were growth rates from Dec 2019 to Dec 2020, absolute change or increase in value and MAPE. The forecast error from a 365 days horizon were from 1.5% to 6% which was relatively an acceptable forecast error range. Although RMSE and MSE graphs were not shown from this report, their ranges were also relatively acceptable.

The final Top 3 zip codes recommended were 98651-Underwood, WA, 80482-Winter Park, CO and 97031-Hood River, OR. The combined growth rate from Dec 2019 to Dec 2020 was estimated to be around 9.75% and absolute change or increase of $165K in a 12-month period. In short, investing a total of $1,693K as of Dec 2019 median home value for the 3 zip codes was forecasted to be $1,858K by Dec 2020.

Moreover, as another option, we can replace 97031-Hood River, OR with 97041-Mount Hood Parkdale, OR, since their values were not far from each other. This may require further research or data should we entertain this route.

In the interest of time in getting more data or information, these analyses were scoped down to only using crime rates and median household income in filtering the data. Information like economic growth rates, unemployment rate, infrastructure development scoring, and investment scoring can be used. Moreover, recommending the Top 3 zip codes also depends on the available resources as a consideration that wasn't provided for this case study.