Factors Affecting the US Real Estate Market

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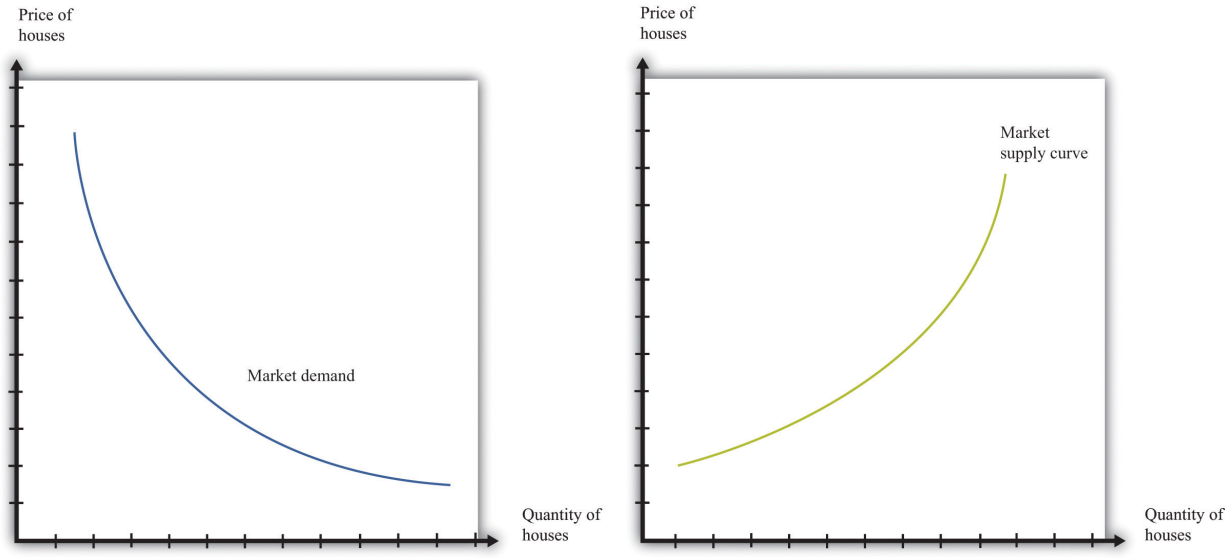
Abstract

The supply-and-demand framework is almost certainly the most powerful model in the economist's toolkit. Armed with an understanding of this framework, you can make sense of much economic news, and you can make intelligent predictions about future changes in prices. The scope of this project is to review United States housing data and identify the factors that affect the US Real Estate Market's supply and demand.

Housing Supply and Demand

Assumption: The primary factor influencing demand for housing is the price of housing. By the law of demand, as price decreases, the quantity of housing demanded increases. The demand for housing also depends on the wealth of households, their current income, and interest rates.

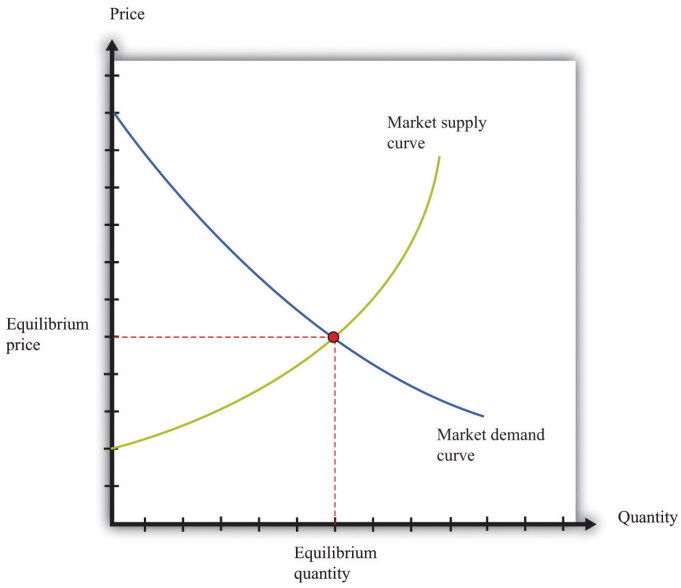
Supply and demand is a framework we use to explain and predict the equilibrium price and quantity of a good. A point on the market supply curve shows the quantity that suppliers are willing to sell for a given price. A point on the market demand curve shows the quantity that demanders are willing to buy for a given price. The intersection of supply and demand determines the equilibrium price and quantity that will prevail in the market.



Equilibrium in a market refers to an equilibrium price and an equilibrium quantity and has the following features:

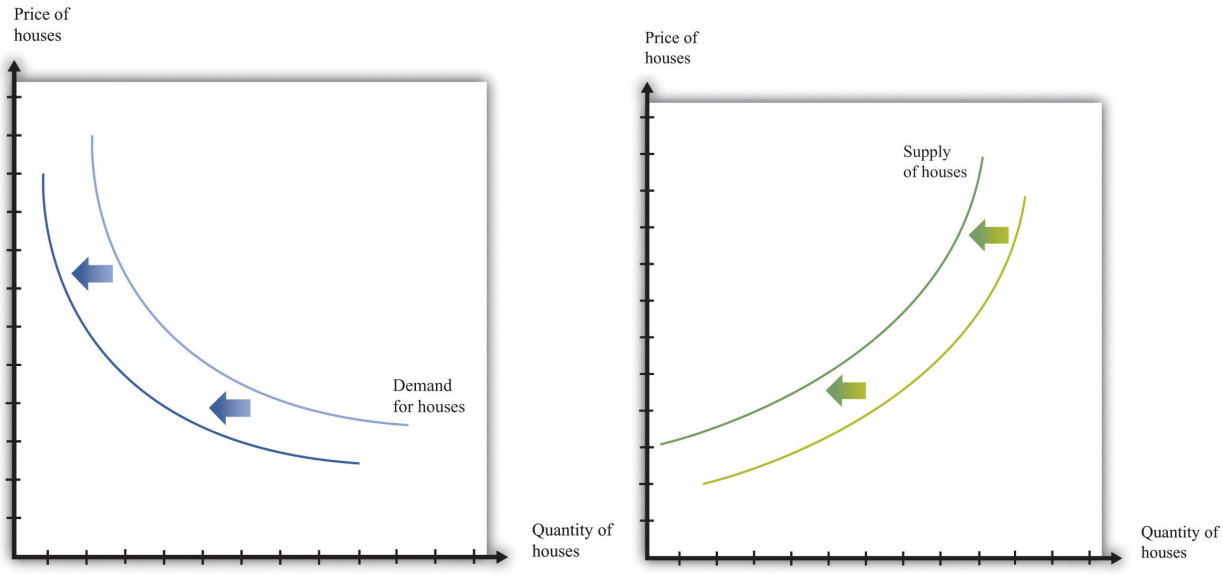
- Given the equilibrium price, sellers supply the equilibrium quantity.
- Given the equilibrium price, buyers demand the equilibrium quantity.

The point where supply and demand meet is the equilibrium in the market. At this point, there is a perfect match between the amount that buyers want to buy and the amount that sellers want to sell.



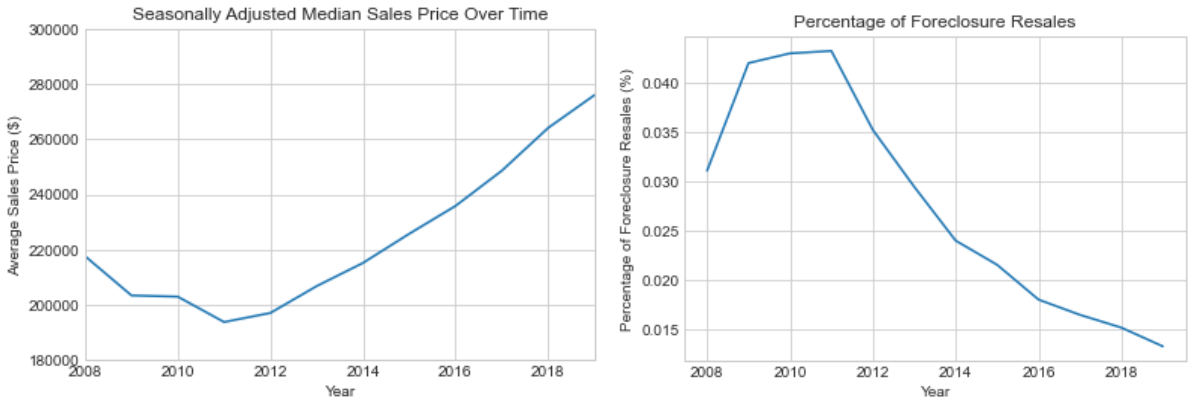
Shifts in demand curve: If there is a decrease in demand for houses, then fewer houses are demanded at each price. The demand curve shifts leftward.

Shift in supply curve: *If there is a decrease in supply of houses, then fewer houses are supplied at each price. The supply curve shifts leftward.*

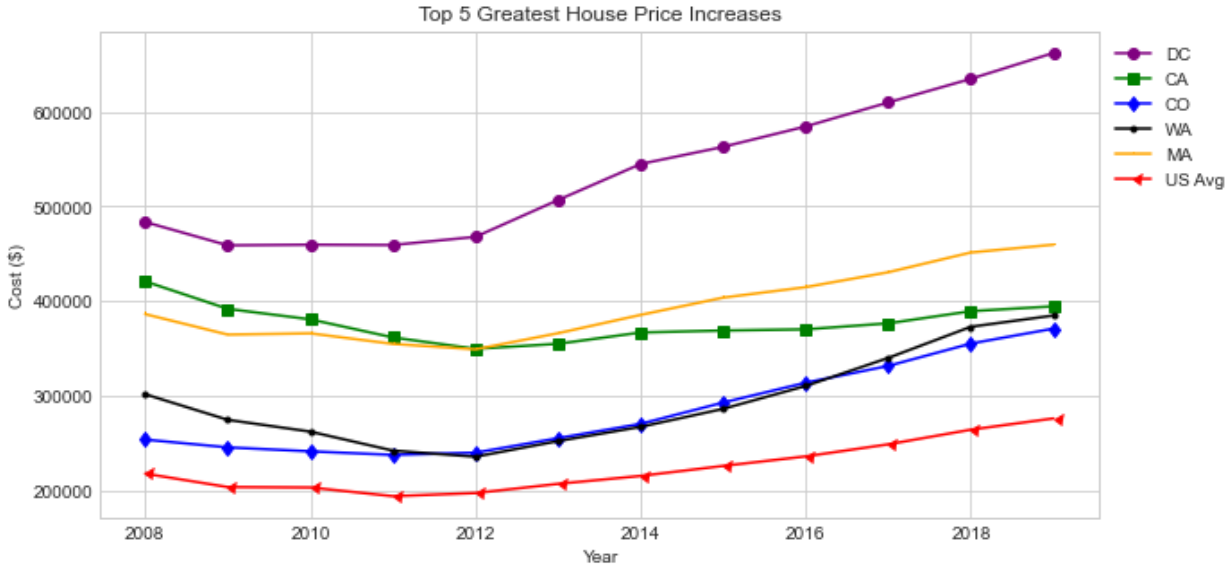


Exploratory Data Analysis and Inferences on the Data Used

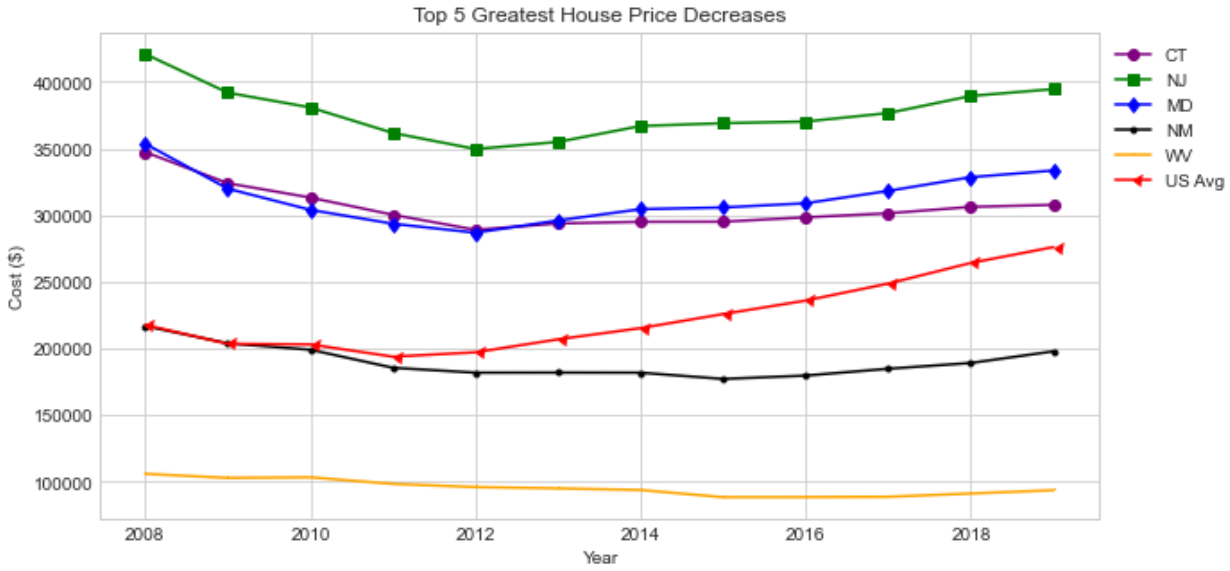
Since 2011 and 2012, average median house sales have steadily increased and foreclosure resale rates have continued to decline. The increase in average median house sales compounded with the decline of foreclosure resale rates indicates that the national housing market has been rebounding since the housing market collapse in 2008.



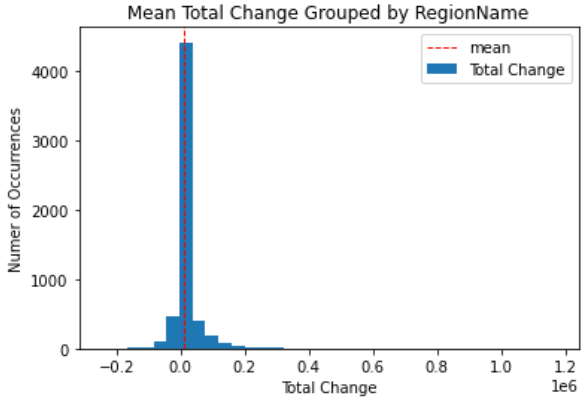
DC, California, Colorado, Washington, and Massachusetts experienced the highest increases in median sales prices since 2008. Interestingly, housing prices in these five areas began increasing in value consistently since 2011 and 2012.

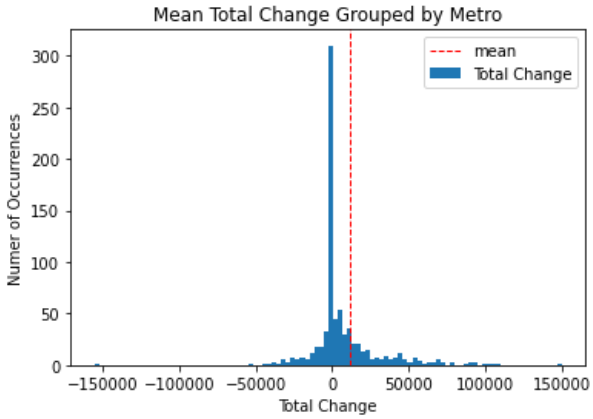


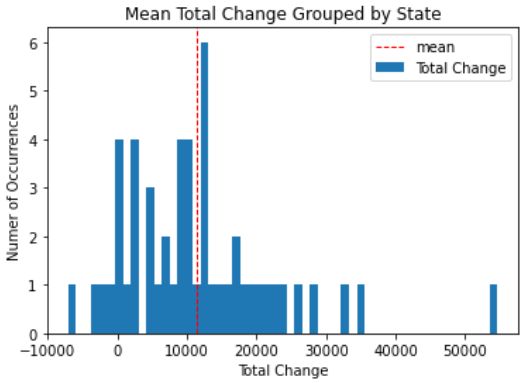
On the other hand, Connecticut, New Jersey, Maryland, New Mexico, and West Virginia experienced median sales price decreases for houses.



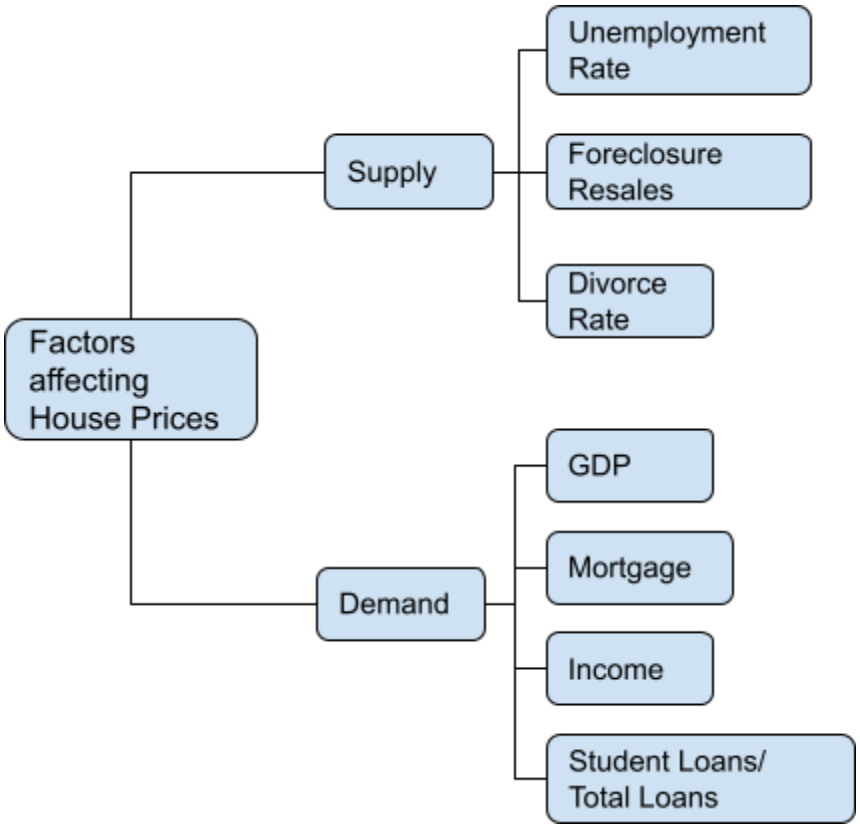
Distribution of Prices grouped by city, metro and state:





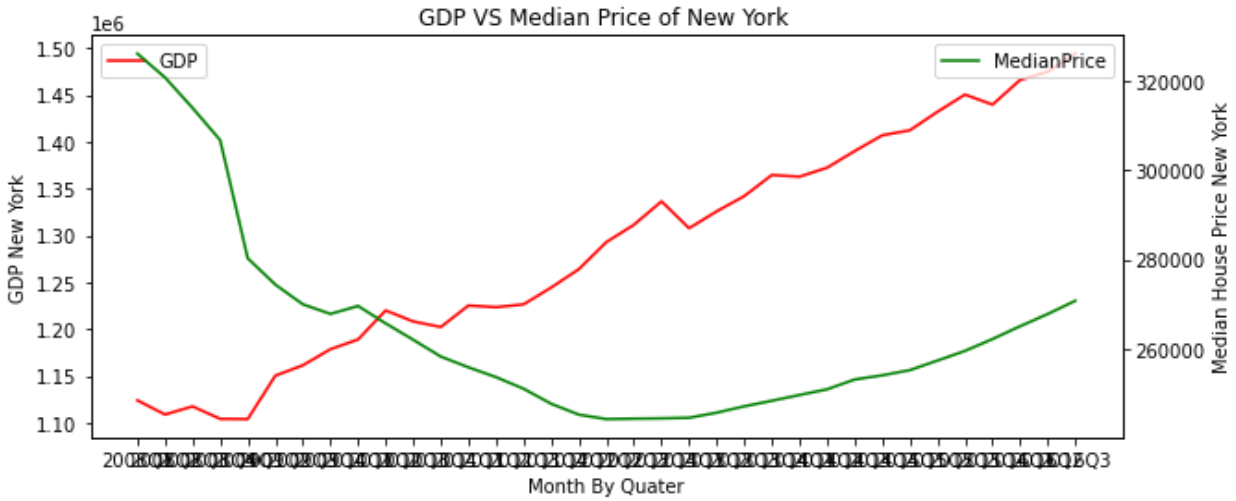


Various Factors considered under the Study



- **GDP**

  The GDP is a measure of output of the economy overall, and the health of the economy. An economy that is doing well usually implies more investment and economic activity, and more buying.


GDP VS Median Price of New York
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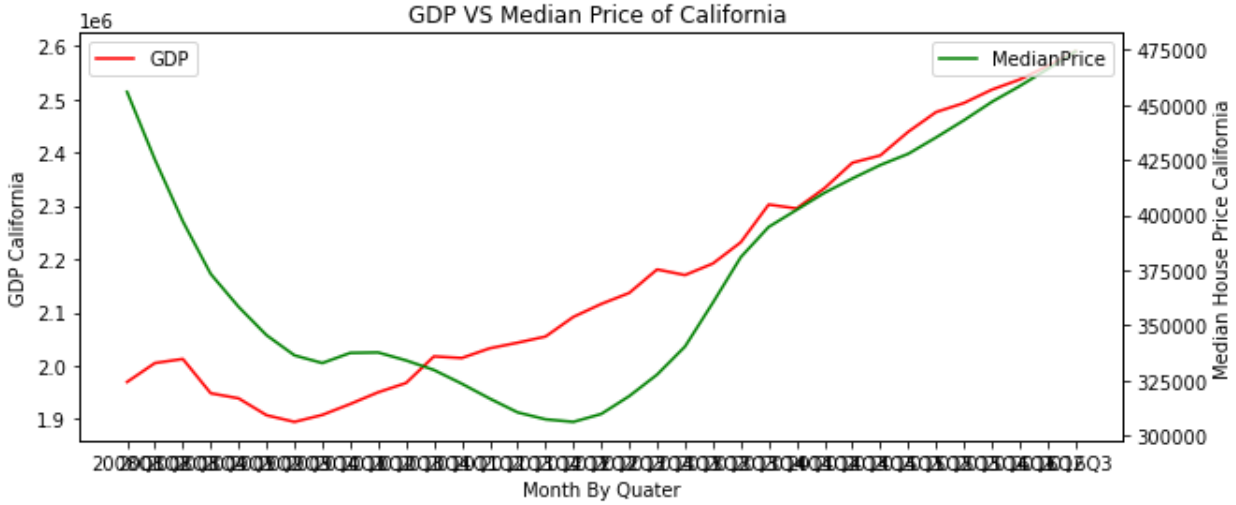
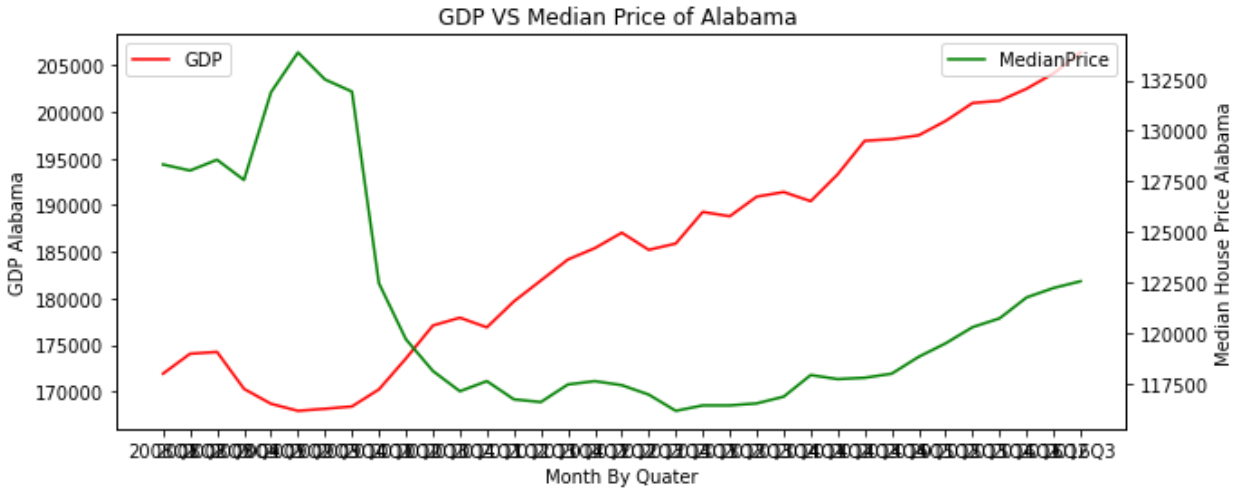
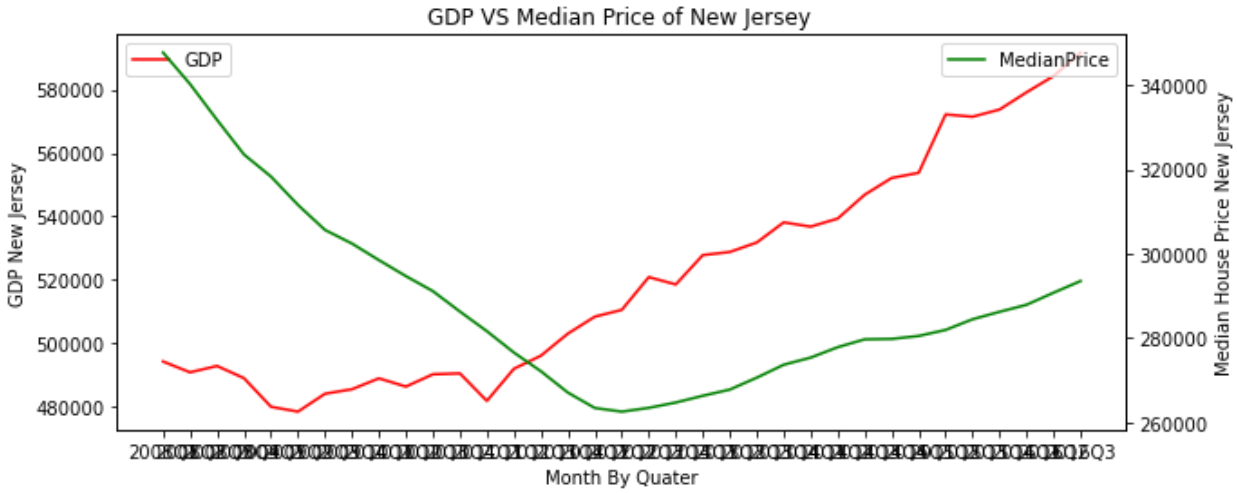
GDP
MedianPrice
GDP New York
Median House Price New York
Month By Quater


GDP VS Median Price of California
1e6
GDP
MedianPrice
GDP California
Median House Price California
Month By Quater

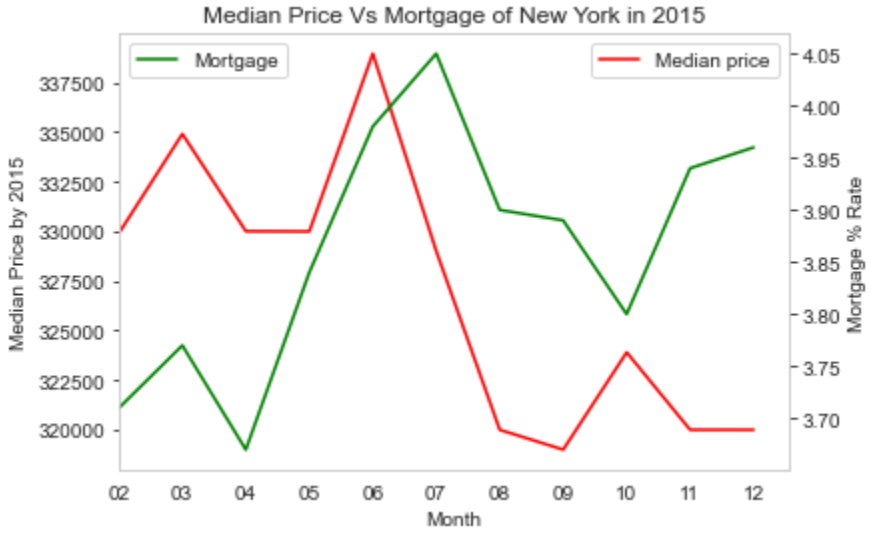


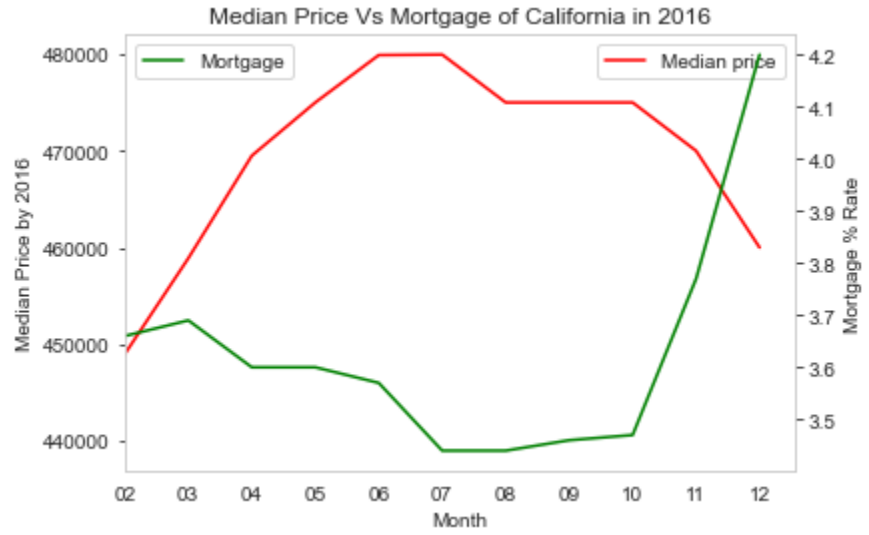


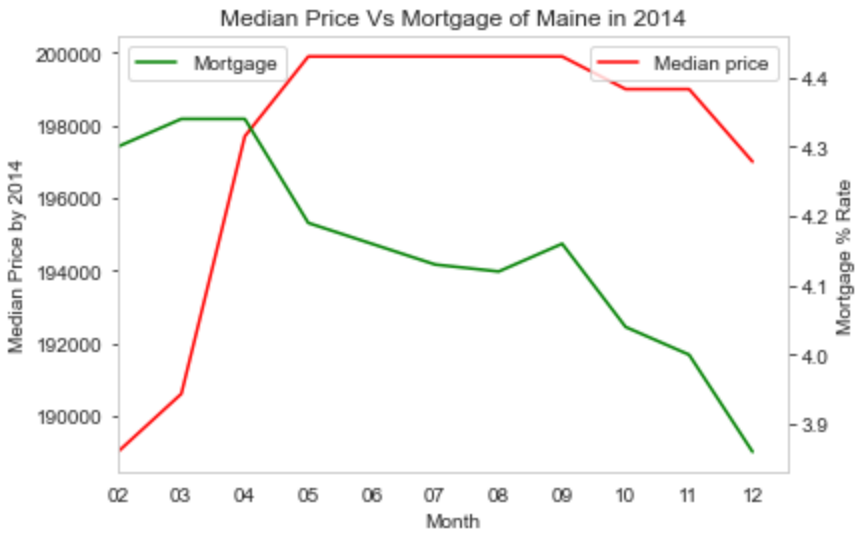
From the plot we can see that there is an inverse relationship between GDP and Median House Price when the Price increases GDP is also increasing and Price decreases GDP also decreases for all the above states. Hence, decrease in GDP will cause a left shift in the demand curve, thus decreasing the demand for houses, hence the house prices.

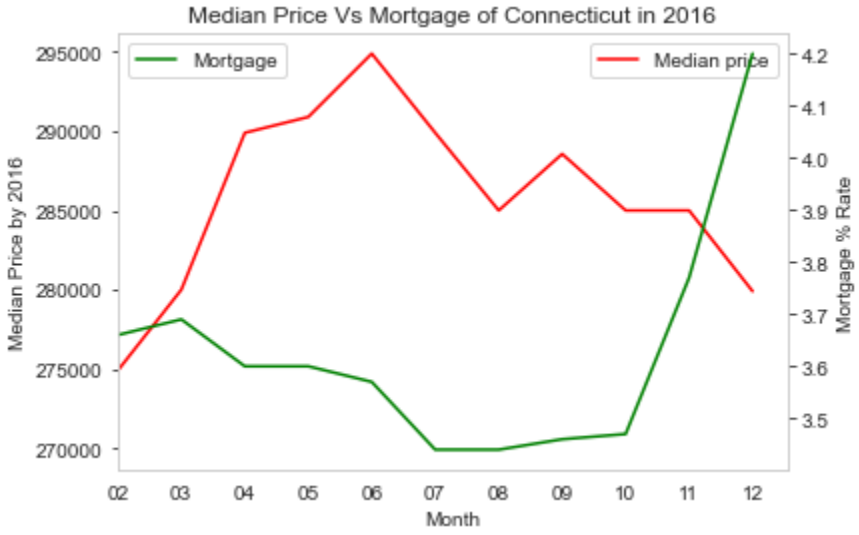
- **Mortgage**

  Mortgage rates are a huge factor that decide how well the real estate market will perform. It plugs into both the supply and demand side of the equation. It affects the availability of financing options to buyers, as well as the ease of financing new constructions. Ideally, increase in mortgage will cause a leftward shift in demand curve, hence decrease in demand of houses, thus house prices decrease to move along the curve to attain equilibrium.









From the plot we can infer that there is no such relationship between mortgage and median house price in any year in any state.However, there's no strong relationship between house prices and interest rates. Generally, mortgage rates tend to rise when the economy is growing, the job market is healthy and wages are rising. In this environment, people can afford more and are more willing to take out a larger mortgage

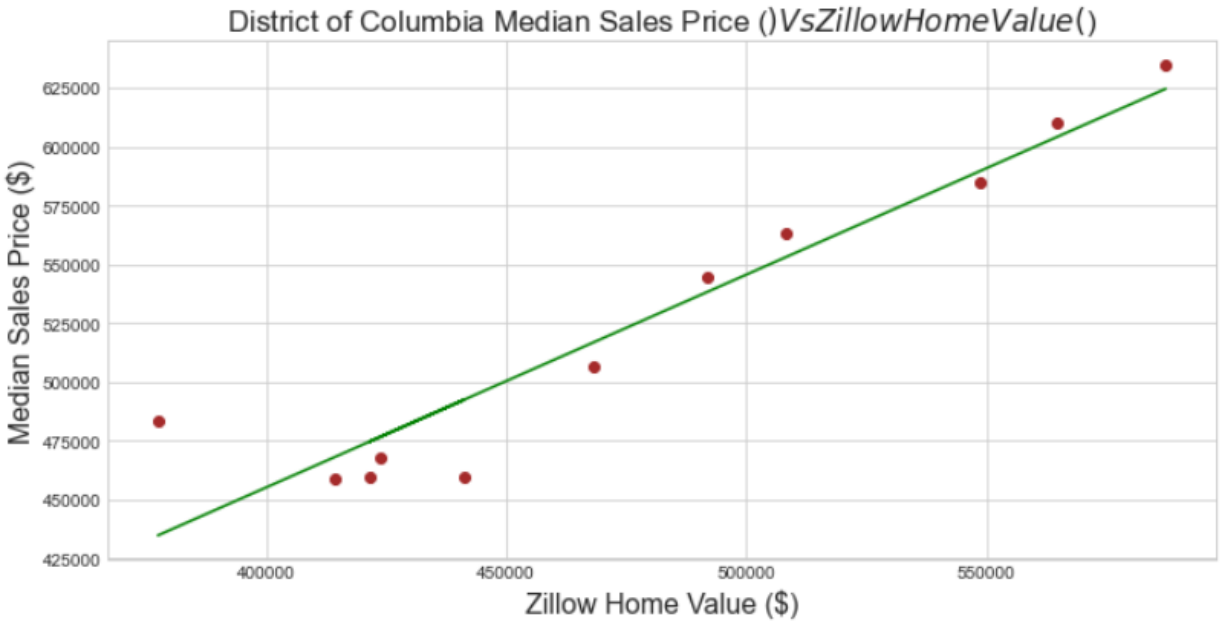
Thus, mortgage and housing price increase or decrease are irrelevant.

- **House Value Index (Zillow House Value Index)**

  Zillow Home Value Index (ZHVI): A smoothed, seasonally adjusted measure of the typical home value and market changes across a given region and housing type. ZHVI represents the whole housing stock and not just the homes that list or sell in a given month. ZHVI will always reflect the value of all homes and not just the ones that list or sell in a given month. There is a strong positive correlation between House Prices and ZHVI.

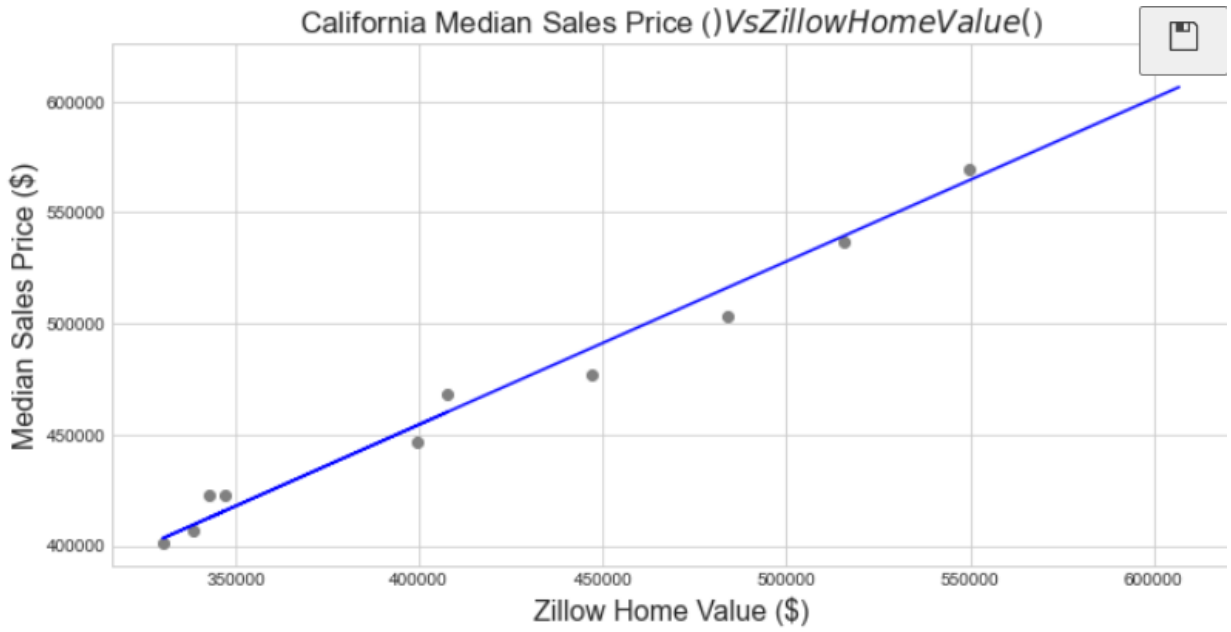
District of Columbia's Strongest Pearson Correlation Factors

Zillow Home Value ($) 0.949020



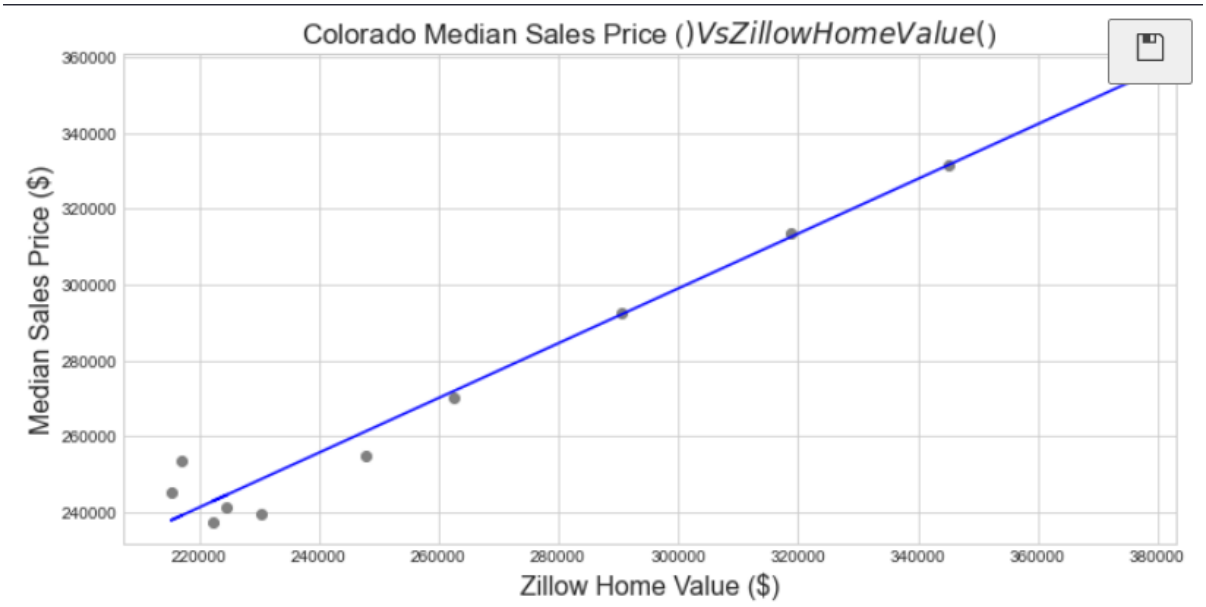
California's Strongest Pearson Correlation Factors

Zillow Home Value ($) 0.992635



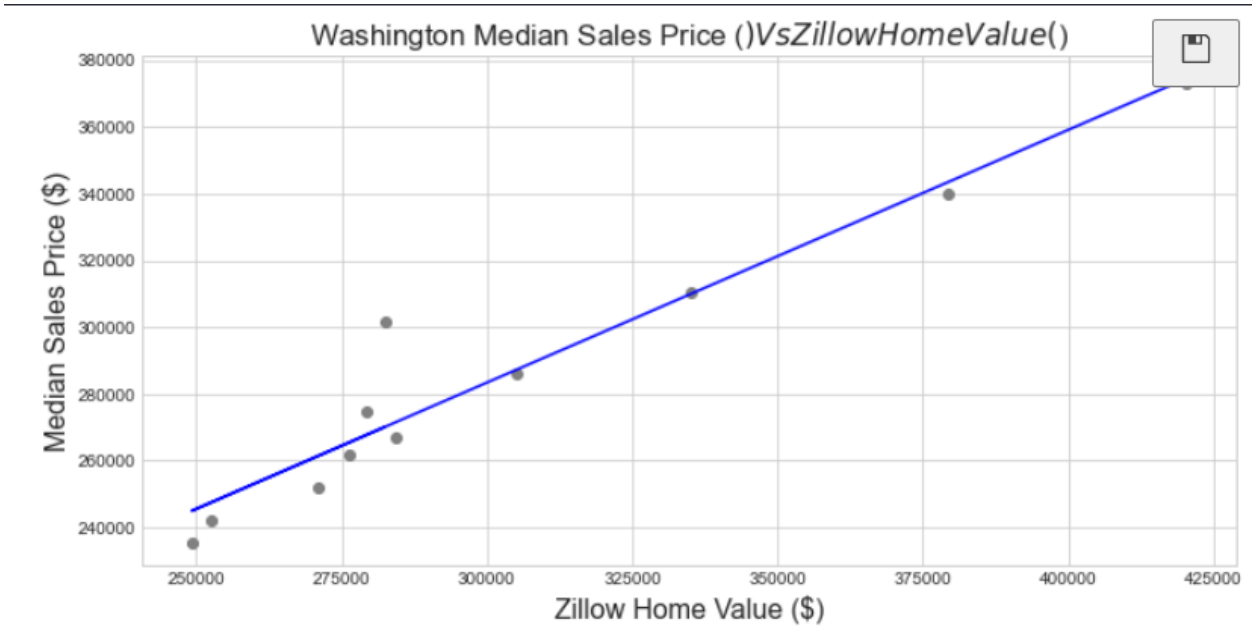
Colorado's Strongest Pearson Correlation Factors

Zillow Home Value ($) 0.987163



Washington's Strongest Pearson Correlation Factors

Zillow Home Value ($) 0.963539



Correlation matrix was developed showing correlations of market variables against the average median sales prices for the top five states with the highest increase and highest decrease in housing prices. The variables looked for correlations with median sales prices included the following: Monthly Home Sales, Foreclosure Resales, Divorce Rates, Unemployment Rates, Student Loan Debt, Total Debt, and Median Household Income.

California's Strongest Pearson Correlation Factors

Unemployment Rate (%) 0.935783

Divorce Rate (%) 0.912950

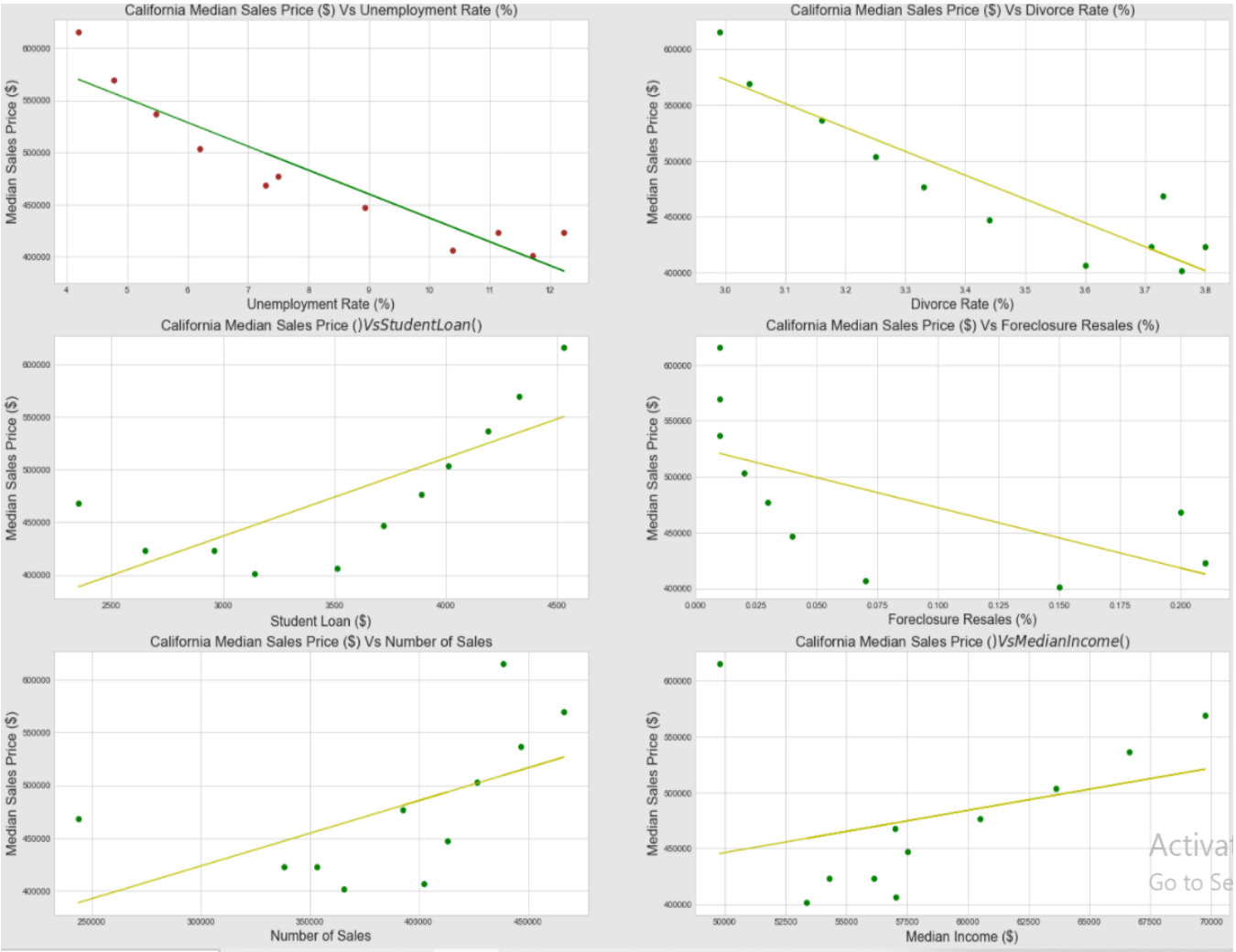
Student Loan ($) 0.751412

Foreclosure Resales (%) 0.665923

Number of Sales 0.554078

Median Income ($) 0.319931

Total Loan ($) 0.220263



Colorado's Strongest Pearson Correlation Factors

Divorce Rate (%) 0.973669

Median Income ($) 0.922247

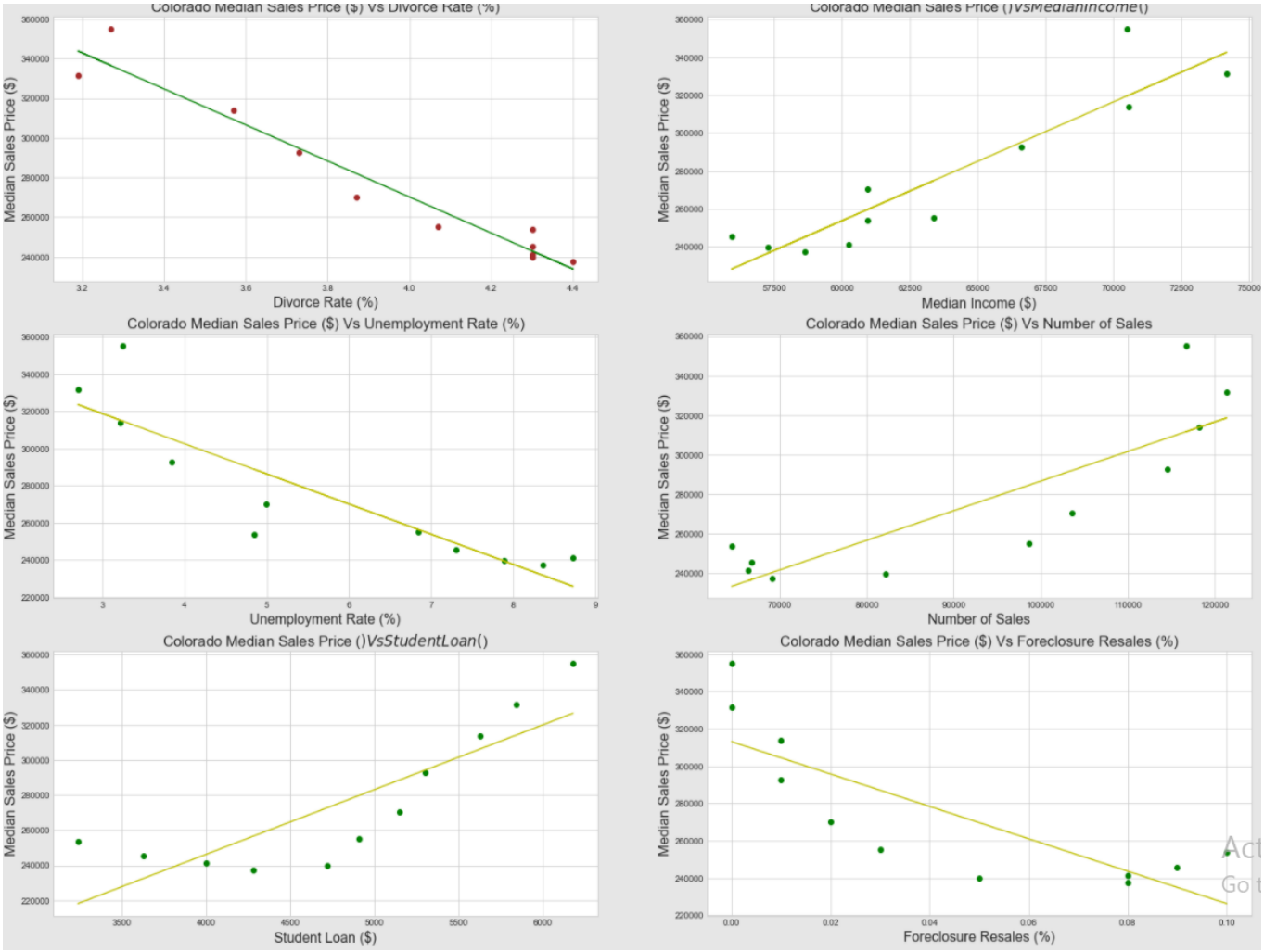
Unemployment Rate (%) 0.886504

Number of Sales 0.854811

Student Loan ($) 0.839119

Foreclosure Resales (%) 0.811425

Total Loan ($) 0.639962



Maryland's Strongest Pearson Correlation Factors

Zillow Home Value ($) 0.779547

Total Loan ($) 0.776818

Unemployment Rate (%) 0.652607

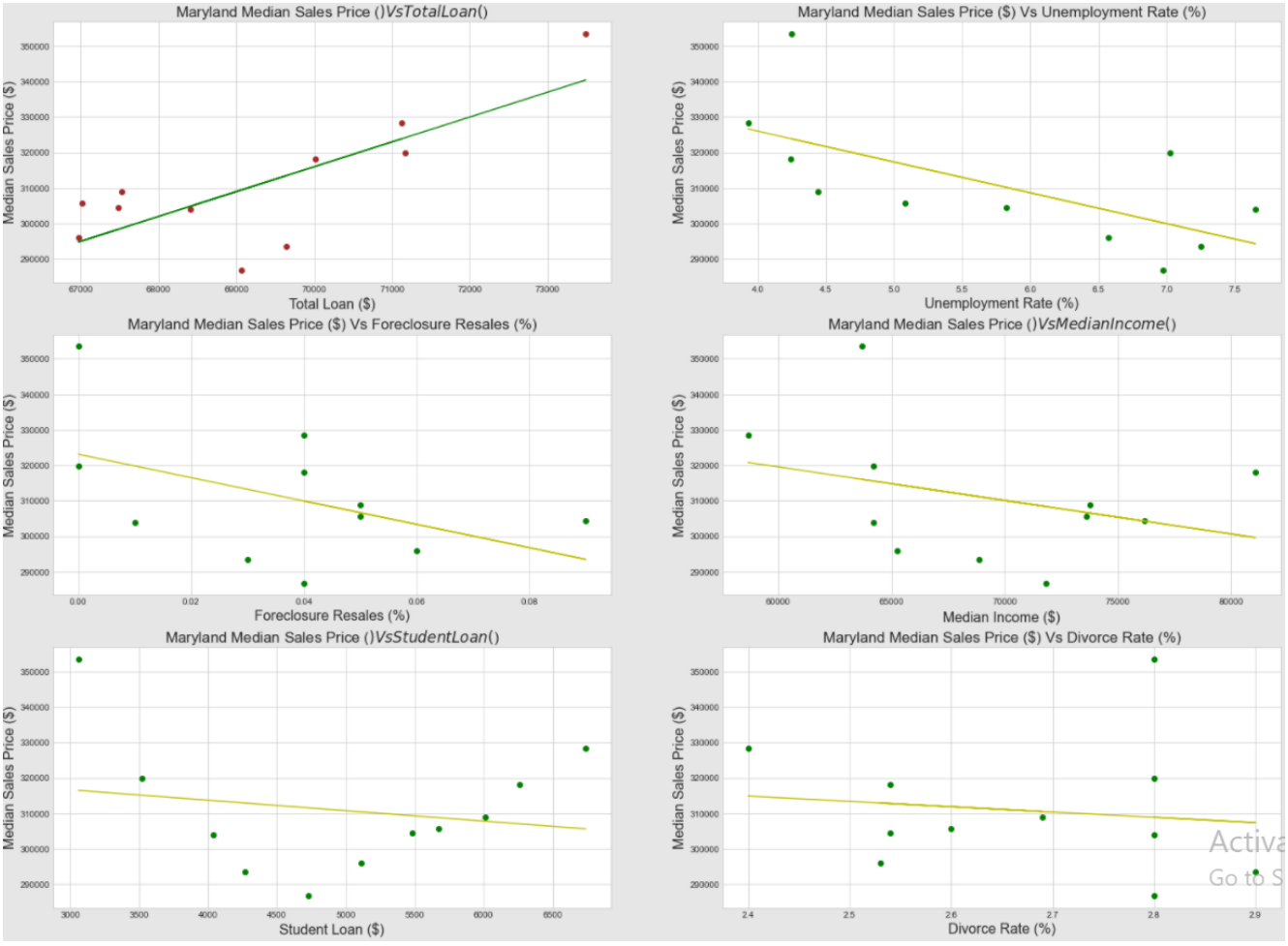
Foreclosure Resales (%) 0.473501

Median Income ($) 0.336728

Student Loan ($) 0.185232

Divorce Rate (%) 0.126994

Number of Sales 0.042351



- **Student Loans/Total Loans**

  Increase in loans will provide the incentive for the people to buy houses, hence increasing the demand, leading to a rightward shift in the demand curve. Thus, house prices also tend to increase.

- **Unemployment Rate**

  A high unemployment rate can mean that people simply do not have the money to spend on houses. It can also mean that there is lower investment in the industry and hence lower supply causing a leftward shift in the supply curve, hence house prices increases.

- **Foreclosure Resales**

  Foreclosure is the legal process by which a lender seizes and sells a home or property after a borrower is unable to meet their repayment obligation. With an increase in resales, the supply tends to increase, which leads to a rightward shift in the supply curve, hence this leads to a decrease in the housing prices.

- **Divorce Rate**

  Increase in divorce rates tends to increase the supply of houses as it leads to resale of houses. Thus, there is a decrease in house price.

- **Income**

  Increase in income will also provide the incentive for the people to buy houses, hence increasing the demand, leading to a rightward shift in the demand curve. Thus, house prices also tend to increase.

References

1. House Prices and Marital Stability: https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.364.4475&rep=rep1&type=pdf
2. Predicting Home Price Trends Based on Economic Factors: https://python-bloggers.com/2021/01/predicting-home-price-trends-based-on-economic-factors-with-python/
3. How Interest Rates Affect the Housing Market: https://www.investopedia.com/markets/
4. The Case-Shiller Index, Real Estate and Inflation: https://www.viralml.com/video-content.html?v=P7wladJzYzY&Title=The%20Case-Shiller%20Index,%20Real%20Estate%20and%20Inflation:%20Hands-On%20Market%20Analysis%20with%20Python
5. Forecasting the U.S. Real House Price Index: https://arxiv.org/ftp/arxiv/papers/1707/1707.04868.pdf

Code Link: https://github.com/swetha4444/Analysing-Factors-affecting-House-Prices-in-the-US