SOUTH BAY AREA HOUSE PRICE ANALYSIS AND INVESTMENT RECOMMENDATION

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INTRODUCTION

- South bay area median house price tops United States as one of the most expensive regions

- House price in this region still grows with double digits YOY, which makes it attractive investment activity

- Before pouring tons of money into real estate market, the following questions needs to be answered:
  - What is the major driving force for the house price increase
  - Which city from south bay area is most promising for investment in terms of job opportunities, next generation education and life convenience

DATA ACQUISITION AND CLEANING

- To understand factors that impact house price, the following data is used:
  - Nasdaq, Dow Jones and S&P 500 stock price from 1996 to 2021, downloaded from Yahoo finance. 6 features in the sheets, but only Close(stock price) and Date is used.
  - United State house price, supply and demand data from 1996 to 2021 is downloaded from Office of Policy Development and Research(PD&R)
  - Santa Clara county house supply vs demand, median house sale price from 2012-2021 is downloaded from Redfin
  - Neighborhood data is downloaded from County of Santa Clara SCCgov website. 65536 neighborhood* 71 features are in the raw data. After cleaning, the neighborhood is grouped based on city, and only 14 features were used
  - Santa Clara School rating is summarized based on GreatSchools.org website and Santa Clara County SCCgov website
 - Silicon Valley companies' coordination is downloaded from github

HOUSE PRICE CORRELATION WITH STOCK PRICE AND DEMAND VS SUPPLY BALANCE

- South bay area house price growth has strong correlation with stock market performance, with variance score 0.90 from multiple linear regression, while United States house price has much weaker reliance on stock market

- South bay area house inventory has sharp drop in 2012, after that it fluctuates between 1500-2000/month. There is no obvious growth for vacancy/sale ratio, but the house price grown steady in the past, indicating supply-demand imbalance is not the major driving force. Linear regression shown a variance score 0.02
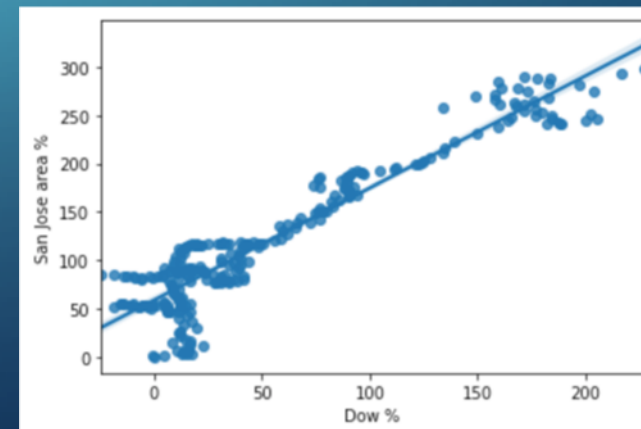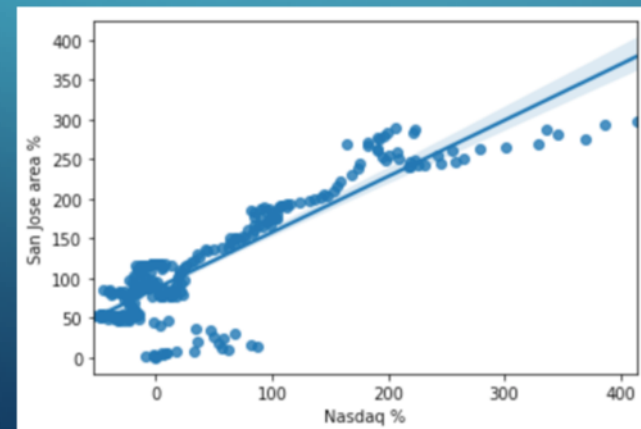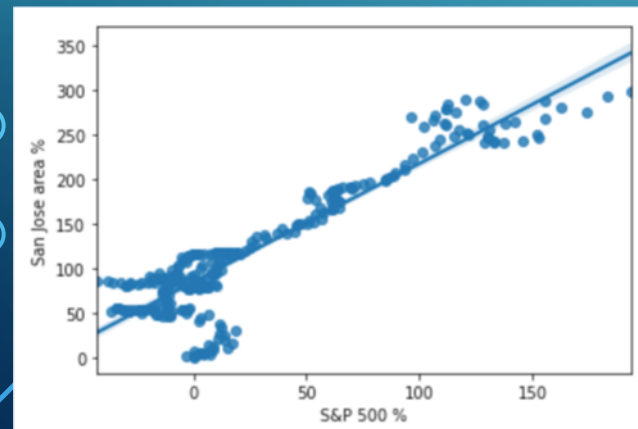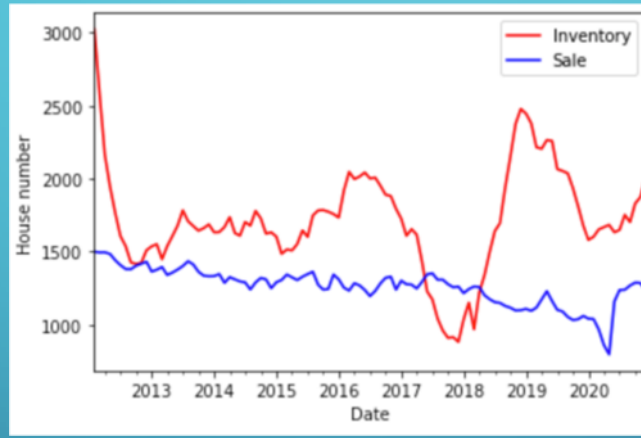
HOUSE PRICE FOR DIFFERENT TYPES OF HOUSES

- Santa Clara county condo, townhouse and single family house median price grown 1.75-2.2 times since 2012
- Vacancy/sale ratio increase slightly for condo and townhouse since 2019, which could be count for their price drop thereafter
- Single family vacancy/sale has no obvious trend of increase or decrease and theirprice has recovered to same level to 2019.
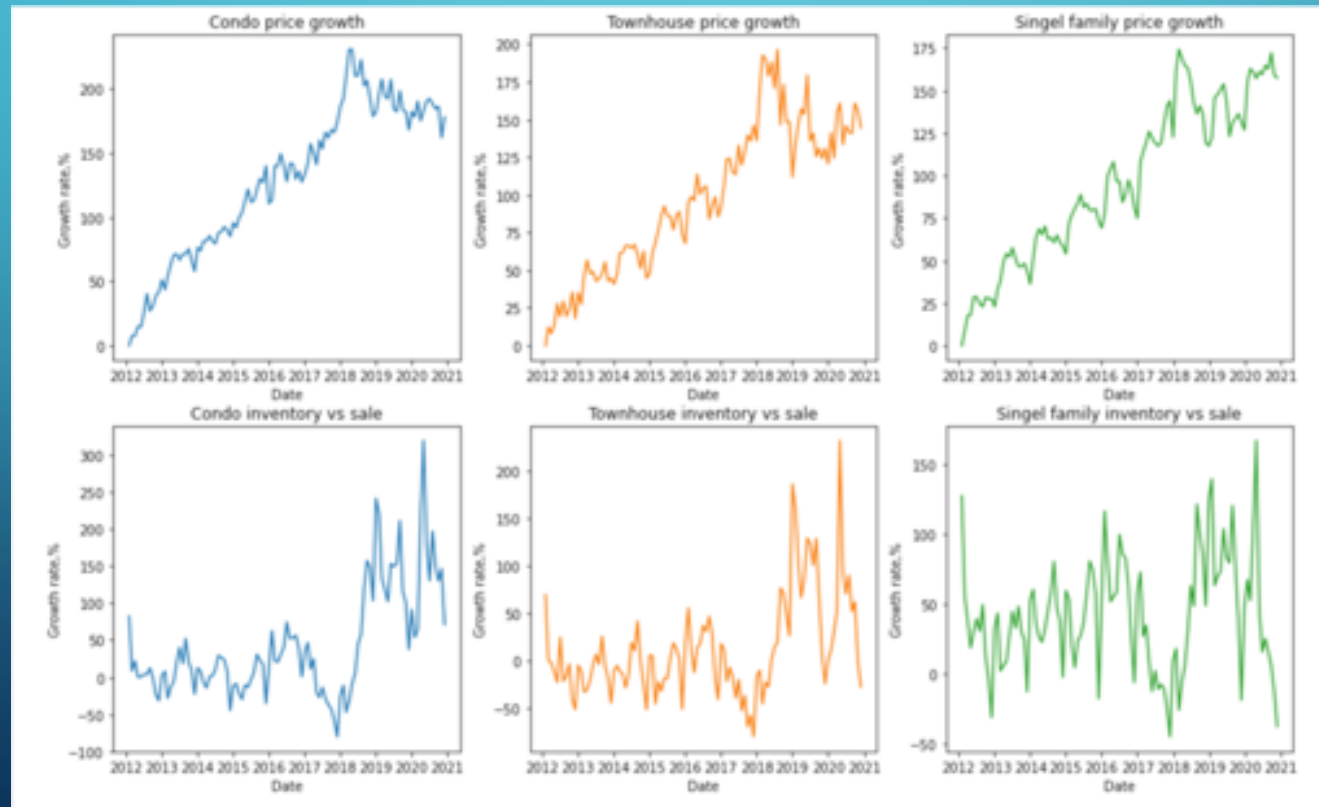
HOUSE PRICE FOR DIFFERENT TYPES OF HOUSES

- No strong correlation for each type of house median price and vacancy/sale ratio
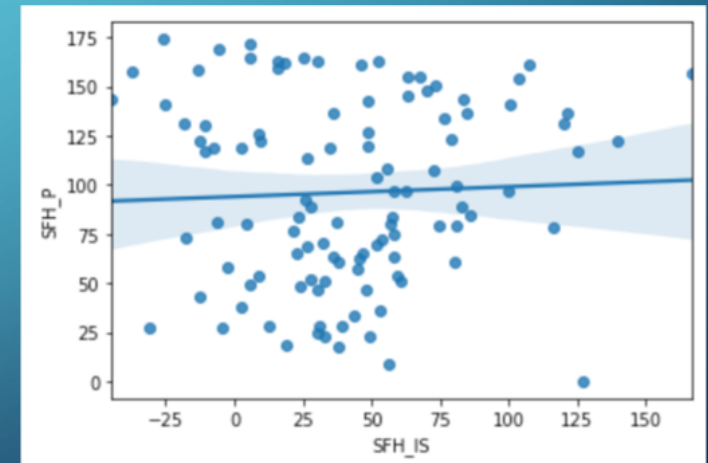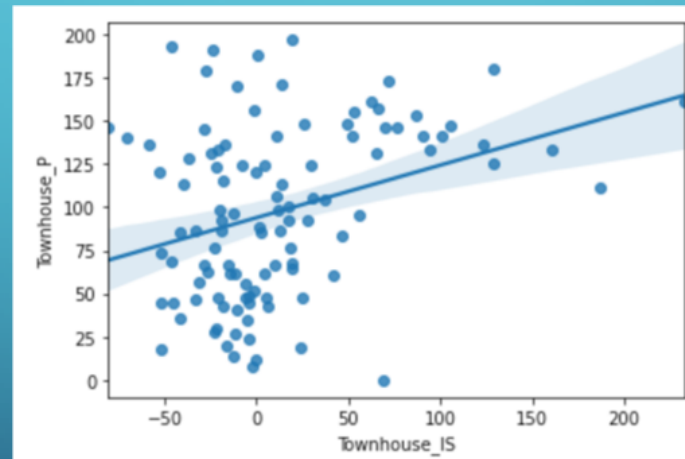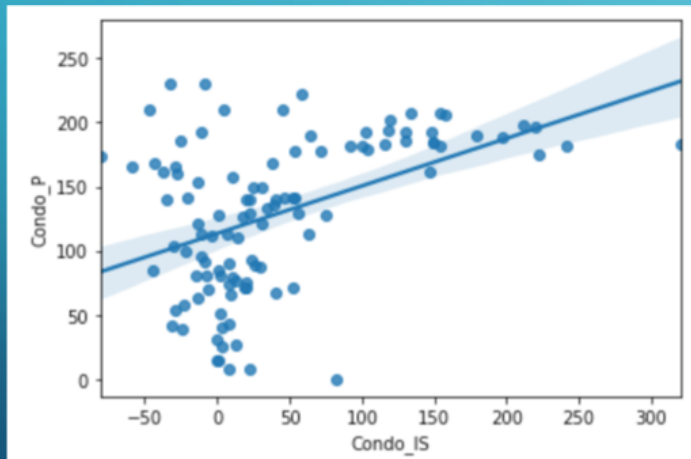
NEIGHBORHOOD' IMPACT ON HOUSE PRICE

- Based on Santa Clara county all the neighborhoods' data analysis, it was found:
  - The leading factors that impact house price is median house income, education, convenience to nearby full service grocery and race.
  - Average number of crime violent, household size, birth rate, poverty rate have no obvious impact on house price
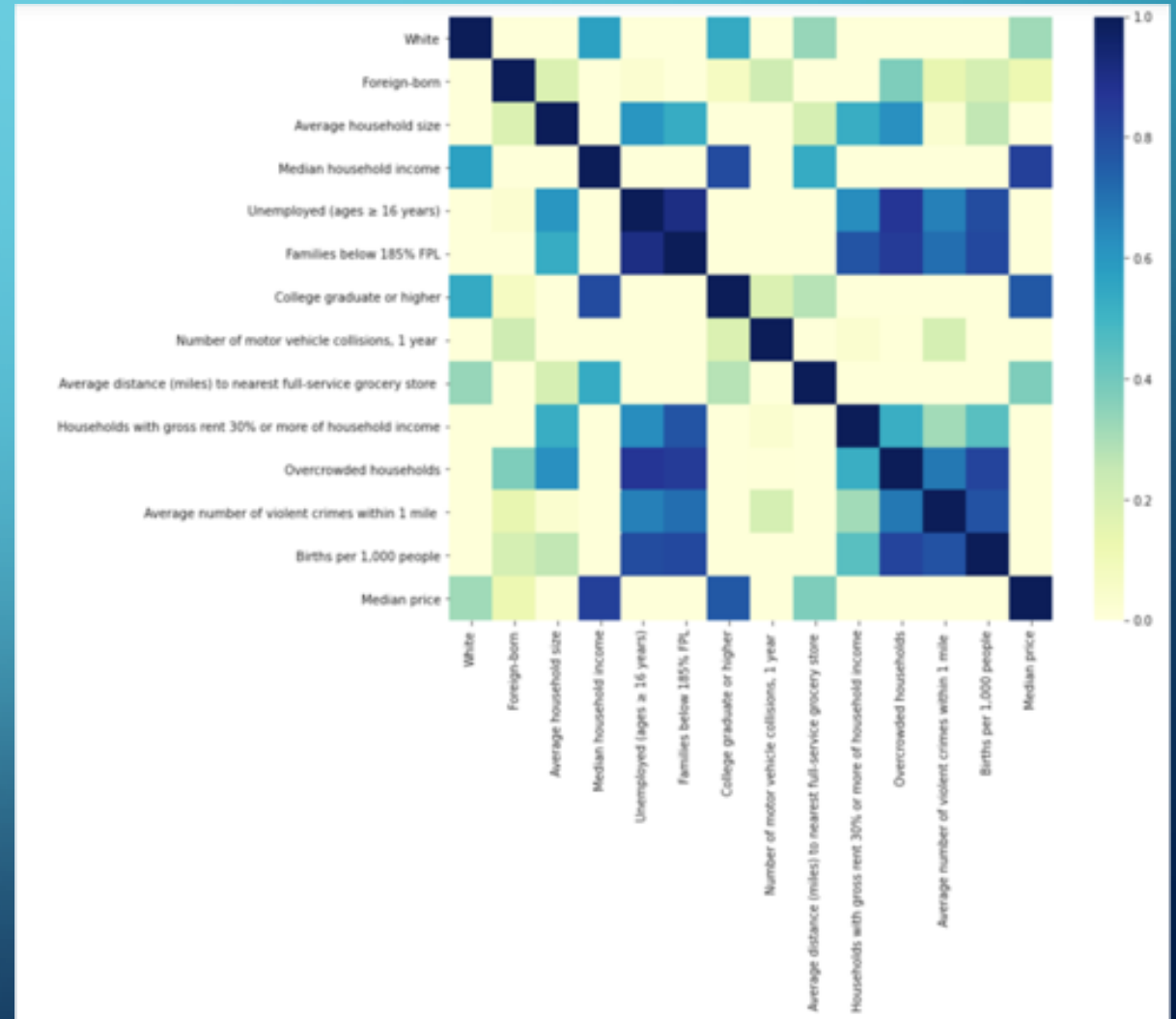
COMPARISON OF 12 CITIES FOR SANTA CLARA COUNTY

- Based on job selection opportunities and public school rating, Palo Alto, west Mountainview, west Sunnyvale and north Cupertino are best choice.

- Job opportunities:
  - Mountainview, Sunnyvale, Palo Alto and Santa Clara have more selection of companies

- Public school system:
  - Cupertino, Palo Alto, west Mountainview, west Sunnyvale, Saratoga, and Los Gatos have more public schools with rating >=8

- Asian food
  - San Jose area has relatively more Asian food restaurants (based on those having coordination from Foursquare)

- 🔴 City location
- 🔵 High tech and major startup company location
- 🟠 Public schools with rating>=8
- 🟢 Asian foods
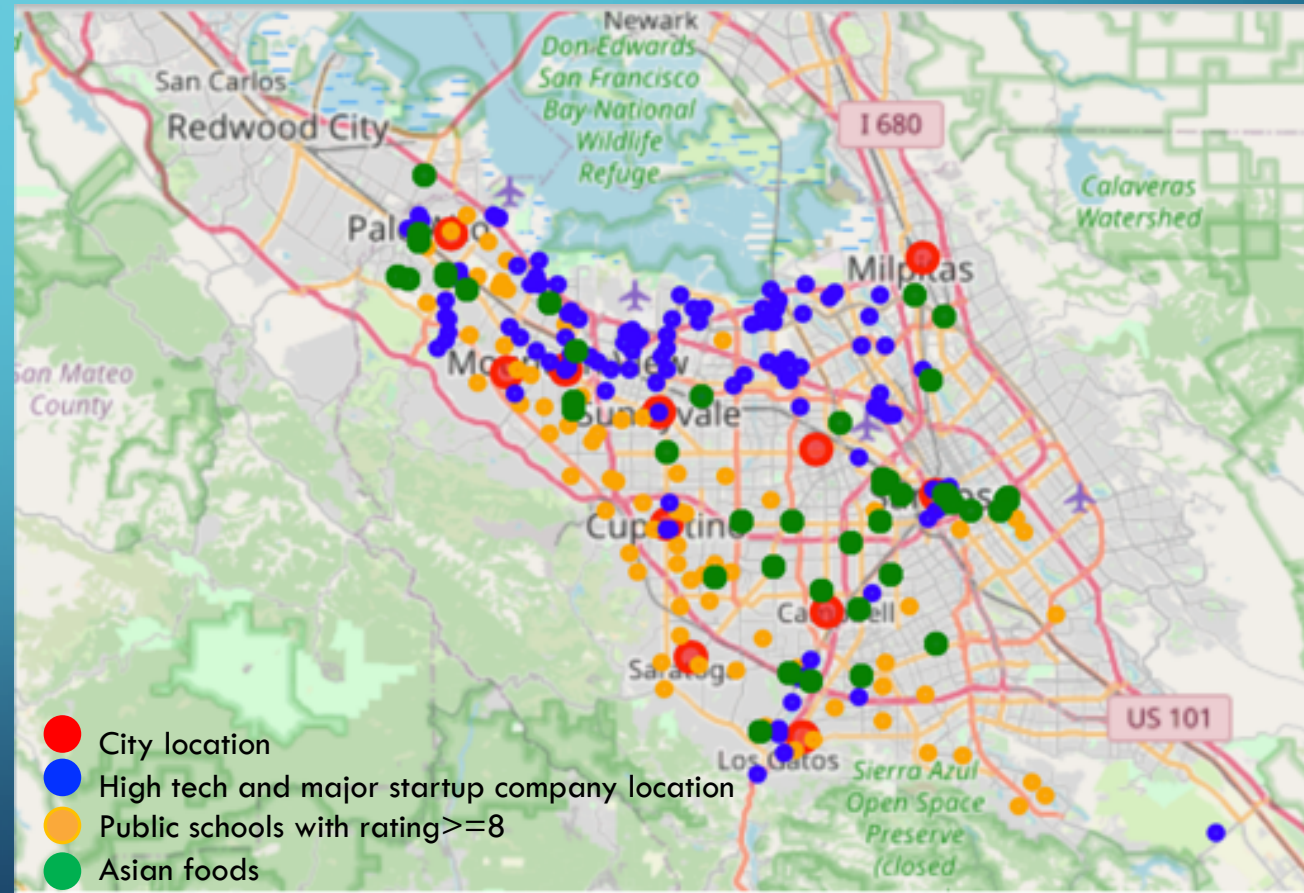
CONCLUSION AND FUTURE DIRECTIONS

- The exercise analyzed multiple datasets include stock performance, supply-demand evolution and median house price. Linear regression is used to figure out which factor is the major driving force for house price growth

- Foursquare is used to query and filter useful restaurant information for each city in Santa Clara county, together with company location and public school rating, their overlay in folium map provides direct comparison of 12 cities in south bay area

- Future direction: Capture individual houses' features to dive into more:
  - Individual house sale price
  - House build year
  - Lot and house square feet
  - Bedroom and bathroom numbers
  - Individual house price evolution with time