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## **California Real Estate Business Environment Assessment**

### **Introduction**

This project is aimed to use GIS as a tool to assess business environment and to select ideal locations for running residential real estate business. My research industry is real estate sales & brokerage industry in California. This industry comprises brokers and agents who sell, buy or rent real estate for others. Industry operators do not own these properties but act as intermediaries between owners or sellers and buyers or tenants. And my target market for this research is residential real estate market.

Industry revenue generally related to population and economic base, housing prices, interest rates, per capita incomes and residential real estate construction activity. It is difficult to make wise investment and start-up decision because there are so many factors work together on residential real estate market and industry. Undoubtedly, different counties have different chance and risk. Thus, GIS is a great tool to clearly analyze and directly show us the result. Geographic data bases on location and the value of data rises with the high accuracy of location. GIS visually show the location and provides the foundation to conduct further analysis such as researching on common features of the best counties in running residential

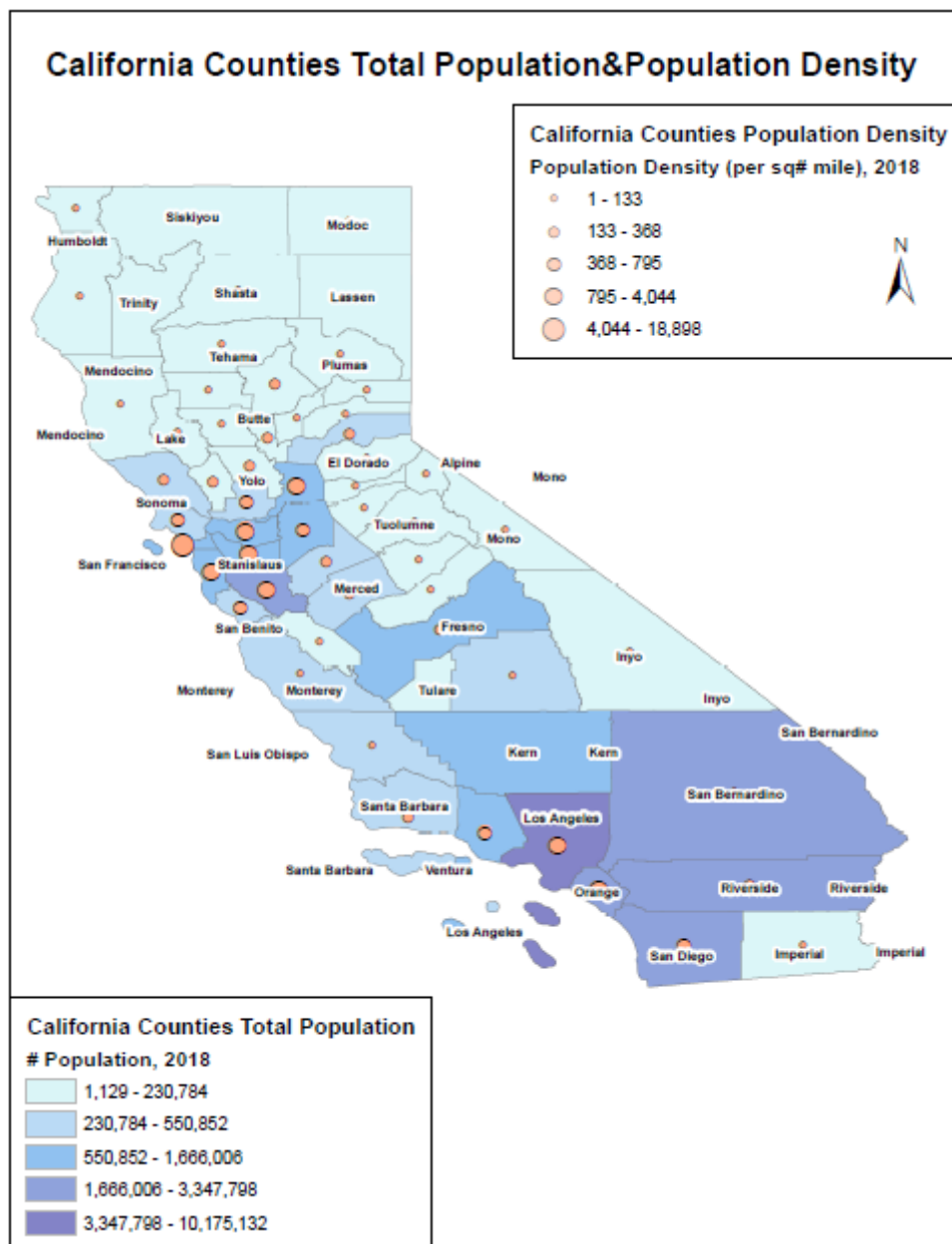
real estate business.

This project will provide entrepreneur who committed to entering the residential real estate industry a clear and comprehensive view and analysis about which counties are the best for starting business.

## Data and Methodology

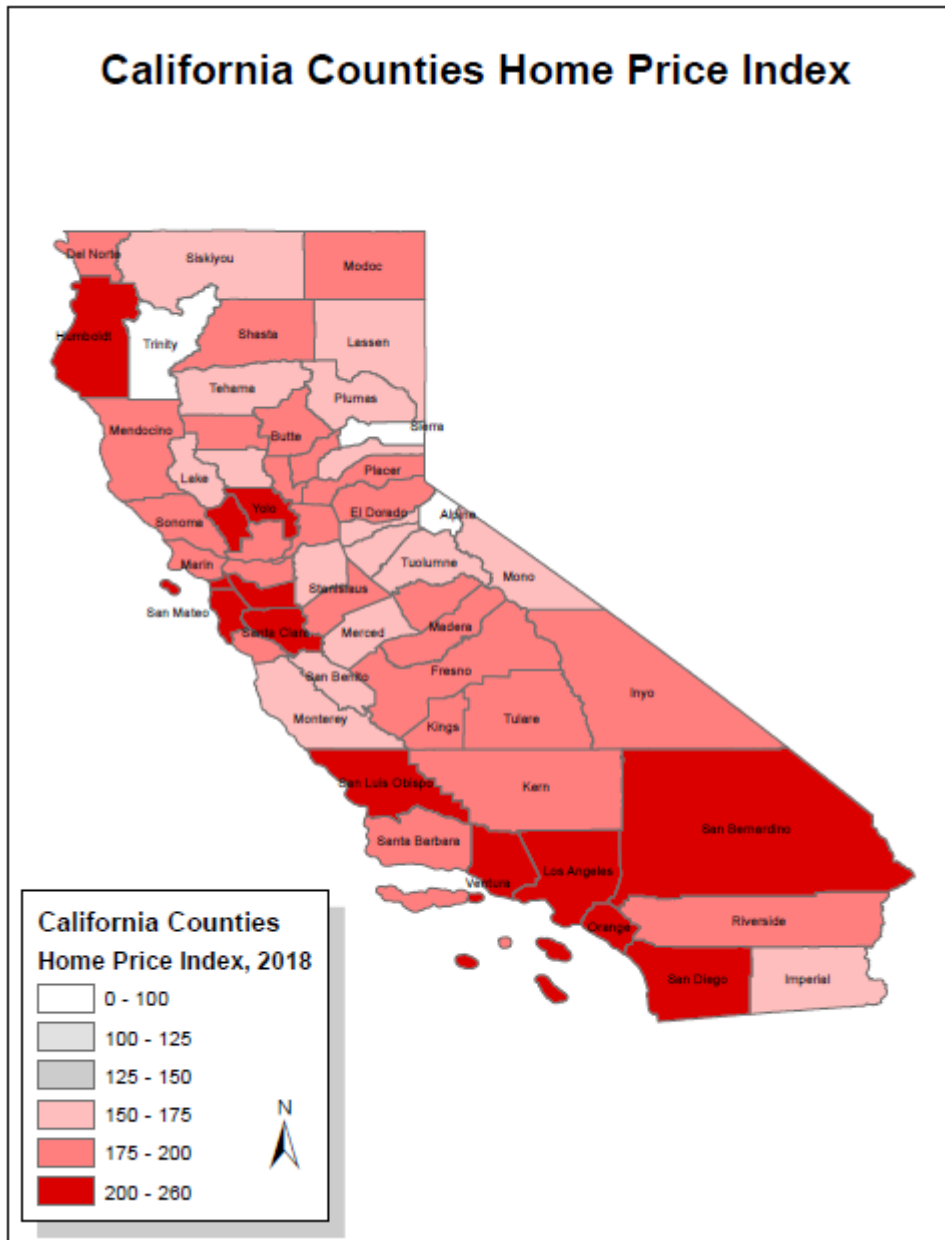
### - Rationale for data collection

To evaluate the business environment for running residential real estate business in all counties of California, it is necessary to collect data about population, home price index, mortgage interest, homeownership rate, per capita income and real estate related business activities.



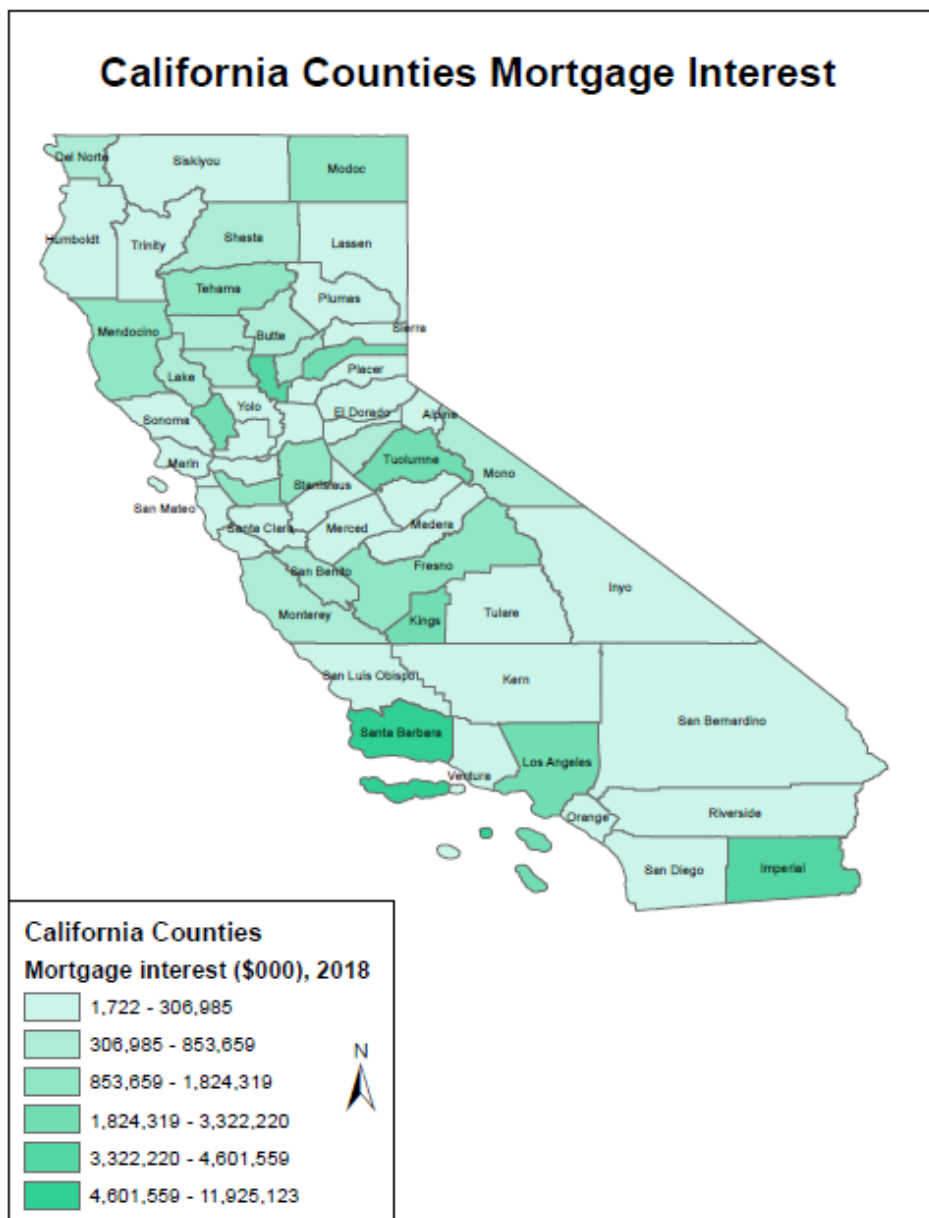
Map 1: California Counties Total Population & Population Density

Housing prices typically reflect the health of the residential real estate market. Rising home prices indicate growing demand for single-family homes and a consequent increase in commission fees received by real estate agents and brokers.



Map 2: California Counties Home Price Index

Buyer demand for homes are influenced by the prevailing mortgage rate that borrowers receive and their amount of deposit. Lower mortgage rates and higher amount of deposit typically increase home affordability and encourage home purchases, thereby raising demand for real estate agents and brokers. Generally, the amount of mortgage interest that mortgagor paid each year can directly reflect residents' affordability and prosperity of real estate market.



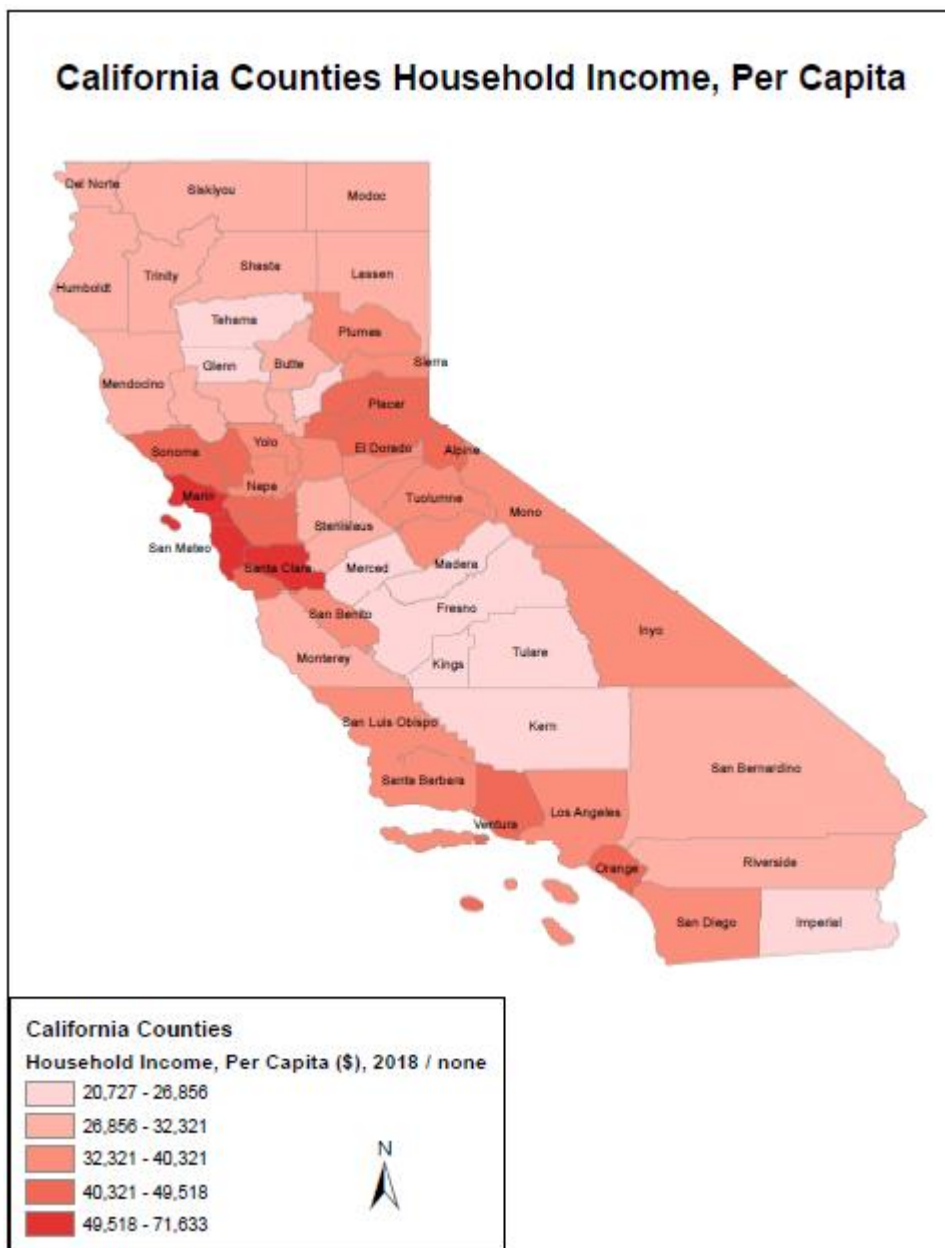
Map 3: California Counties Mortgage Interest

Brokering single-family and multi-family home sales is a primary industry service. As a result, when the homeownership rate rises, industry revenue usually increases. Higher homeownership rate also shows better economic condition of county.



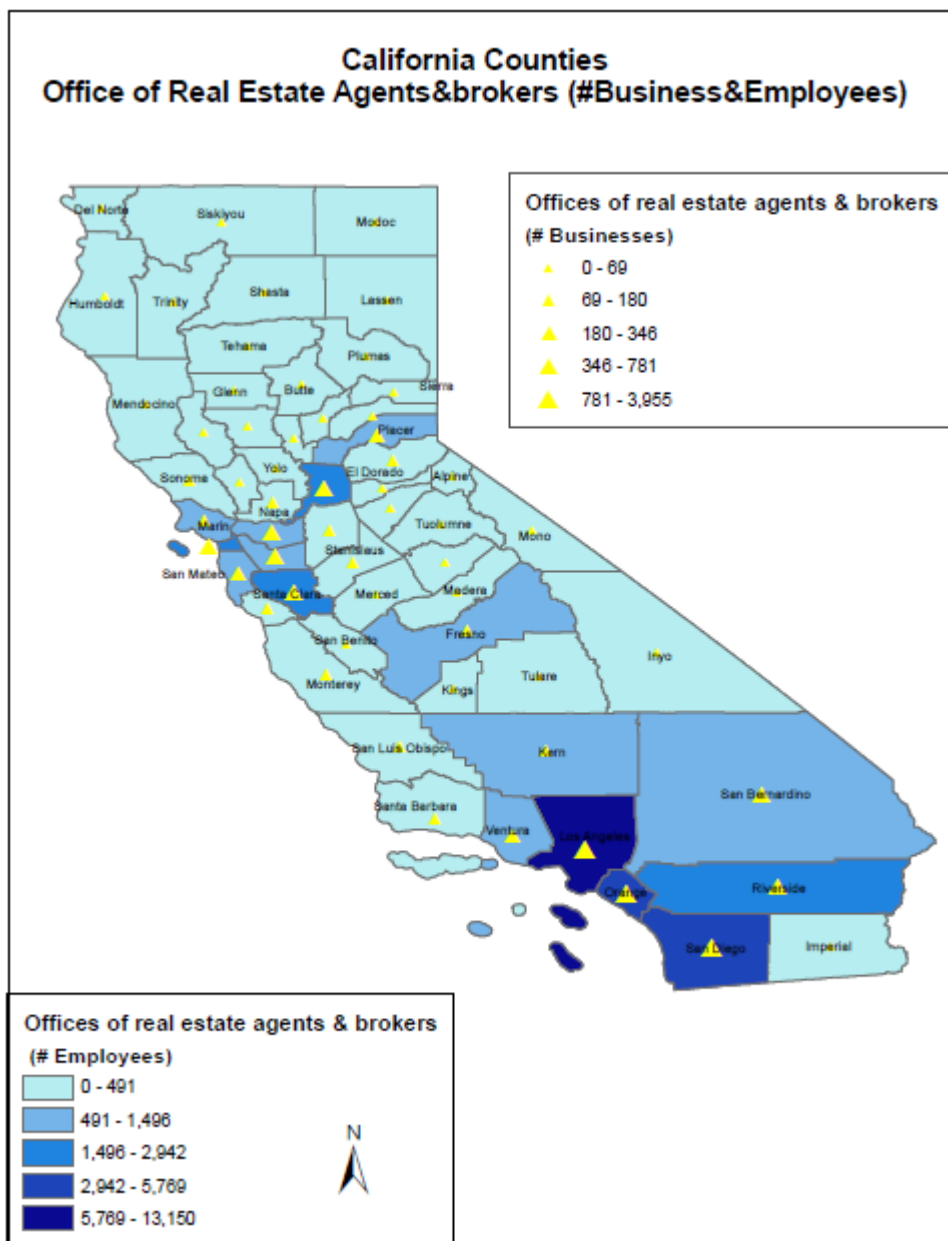
*Map 4: California Counties Homeownership Rate*

Growth in household income positively affects homeownership rates, home affordability and sales volumes. Rising per capita household income also heightens consumers' ability to purchase goods and services, thereby affecting businesses' need and capacity to expand. Therefore, an increase in per capita household income has a positive effect on industry agents and brokers' residential and commercial real estate markets.



Map 5: California Counties Household Income

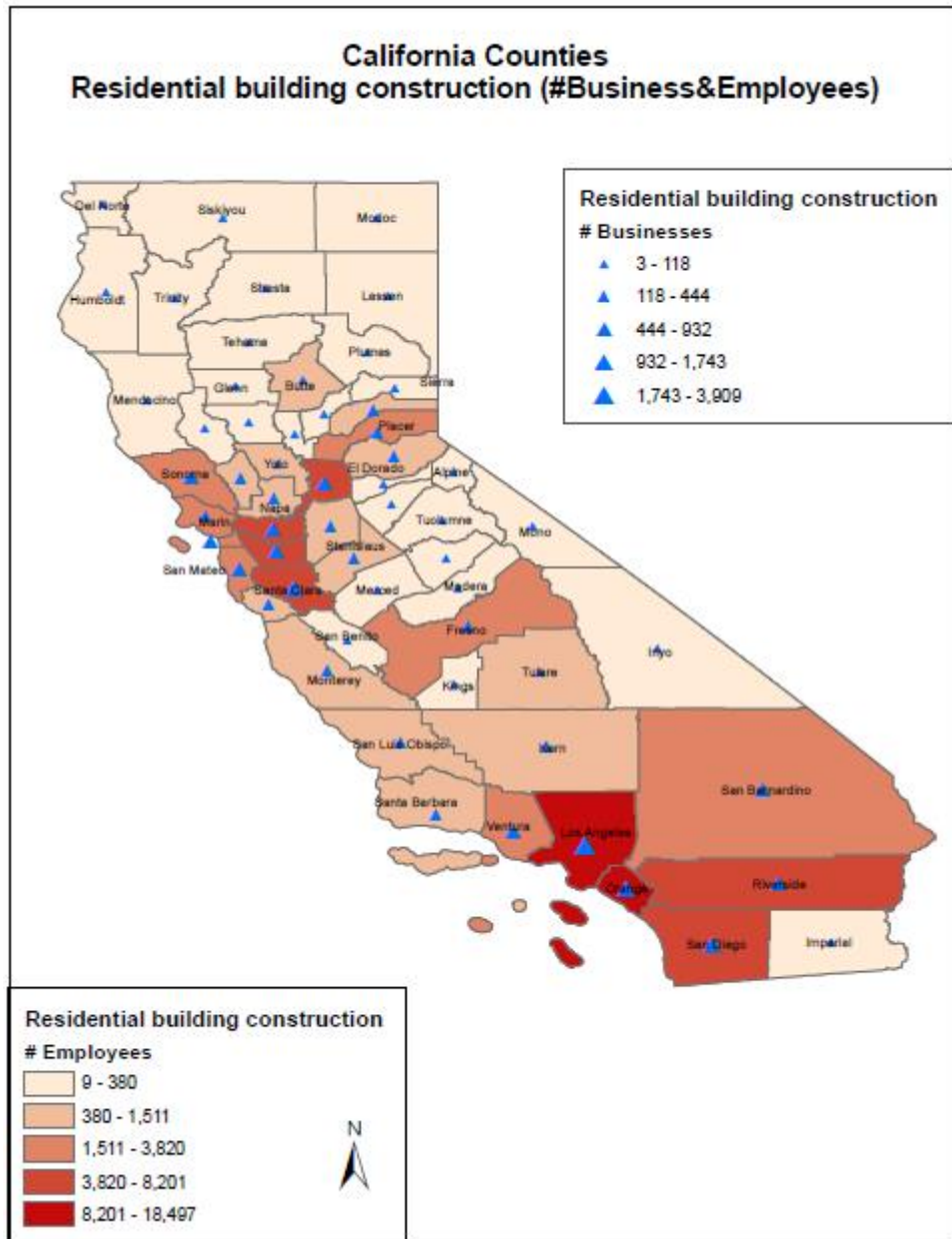
An increase in number of industry business establishments and employees generally reflect higher business confidence, which could mainly come from high profit margins and low entry barriers. These are main reasons that attract new entrants to enter local residential real estate market.



Map 6: California Counties Office of Real Estate Agent & Brokers (#Businesses & Employees)



Real estate businesses typically expand with new construction of new properties or facilities. As business investment in residential construction industry grows, demand for agents and brokers that service the residential sector also increase.



Map 7: California Counties Residential Building Construction (#Businesses & Employees)

- Data Source

All the place shapefiles of California State are imported from the United States Census Bureau (<https://www.census.gov/>) to the ArcMap as map layer. I included all 56 counties in the attribute table of the place shapefiles and export the data as a new layer. The original place shapefile layer was removed. The HPI data was collected from Federal Housing Finance Agency (<https://www.fhfa.gov/>). The demographic data was collected from US Census Bureau website and the other data was collected from SimplyAnalytics (<https://simplyanalytics.com/>) and exported to Excel for further processing.

- Data Cleaning

An index number was created by processing ten sets of data. Firstly, each county will be scored according to 10 categories respectively by calculating. The 10 external factors are assigned by weighted proportions to generate a single overall score for each county, which combines all the impacts of the 10 factors. The proportion assigned to each category is shown in table1. The overall score is calculated by adding the proportionally weighted score of individual categories. The result of overall score for each county is shown in figure 1.

Total Population	Population Density	HPI	Mortgage Interest	Homeownership Rate	Household Income, Per Capita	Offices of real estate agents & brokers (# Businesses)	Offices of real estate agents & brokers (# Employees)	Residential building construction (#Businesses)	Residential building construction (# Employees)
10%	10%	20%	15%	10%	15%	5%	5%	5%	5%

*Table 1: Weighted Proportion of decisive factors*

Next, I will explain the logic and considerations behind weighted proportion for the ten factors. Total population plays a crucial role in deciding market volume because population creates demand. High population have put significant upward pressure on demand for single family homes, multi-family homes and rentals. Population density is population divided by total land area, which can realistically reflect regional attraction to people. High population density usually means lower operation cost for real estate business. For example, distributing same amount of advertisements in high population density county area could attract more target customers, which lower advertisement costs. Also, it would be more efficient for agents and brokers to conduct business. Home price index typically reflect health and vitality of one residential real estate market. Also, high housing price means high single amount of transaction and high commission fee. The amount of mortgage interest directly reflects residents' affordability and purchase intention. prosperity of real estate market. The reason behind high mortgage interest may be low mortgage rate and strong local economic performance, which give residents confidence to use high leverage to afford house. Higher homeownership rate indicates more current demand, which brings more industry revenue.

Our primary industry service is brokering single-family and multi-family home sales. Higher household income positively leads to higher home affordability and bigger sales volumes. An increase in number of real estate industry business establishments and employees generally reflect higher business confidence. Also, it means lower risks from policies and regulations. As business investment in residential construction industry grows, demand for agents and brokers that service the residential sector also increases. Frequent business activities in residential construction indicates strong demand for the incremental market, which guarantee future customers and sales.

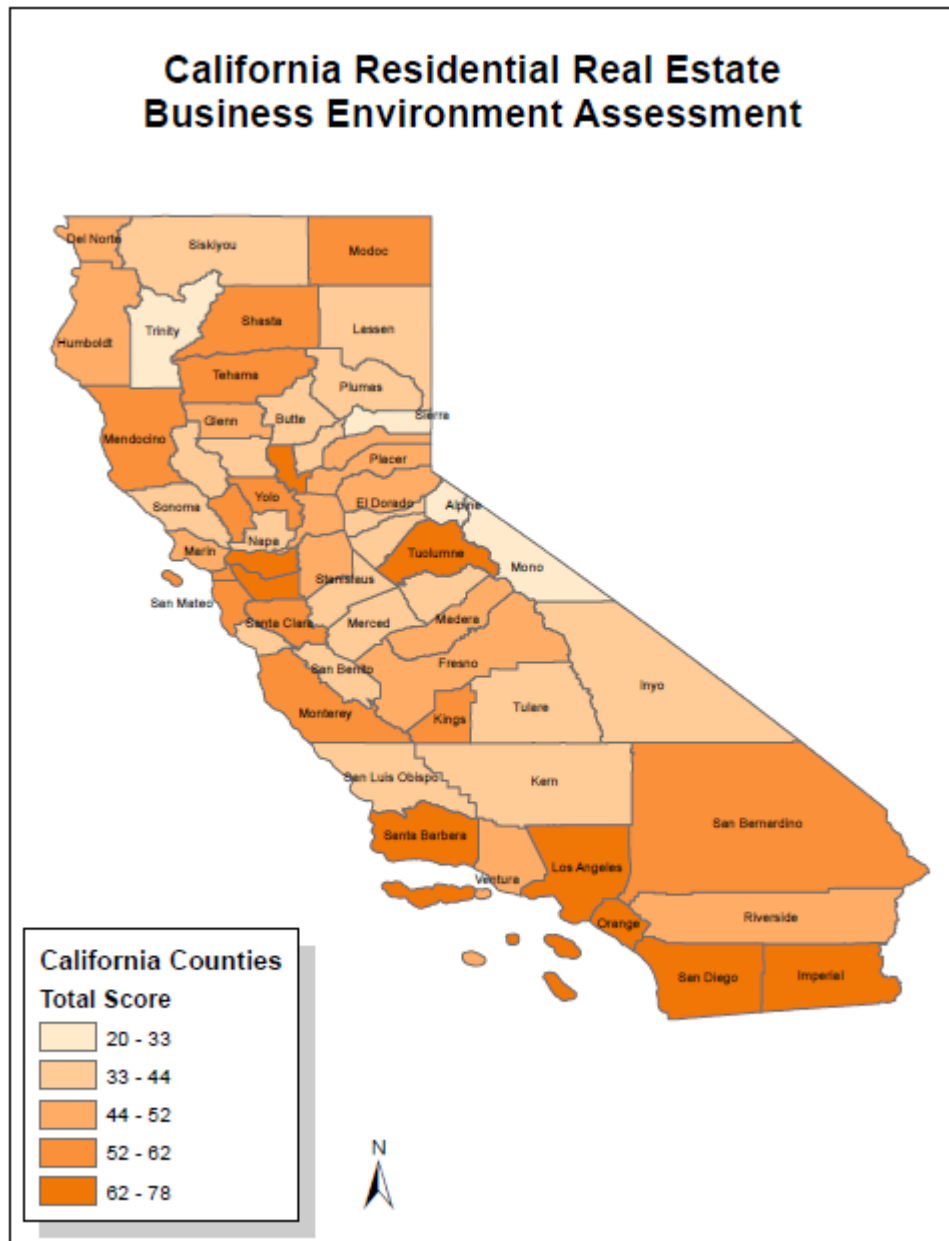
- Mapping

I made 8 maps in total for the project. At first, on the shapefile that have all counties in California, two fields for population were added in the attribute table. Then I joined the cleaned data for population in Excel with the place shapefiles. Having the data in the shapefiles, a thematic map for total population of all the cities was created, using graduated colors based on the total population values. The next step is duplicate the existed layer so that population density can be presented by graduated symbol on the duplicated layer. To have the two-symbology shown on the map, the dot symbol layer was placed on top of the graduated colors layer. The other 7 maps were similarly created by repeating the above steps.

## **Limitation**

The limitations of the project are mainly come from limited time and data resources. When I assessed buyer demand influence factor, it would be more accurate if I use 30-year conventional mortgage rate. But I was impeded in acquiring mortgage rate data for all counties in California. Thus, I chose using mortgage interest amount to replace mortgage rate. Moreover, similar situation happened that I used per capita household income to replace per capita personal income. What's more, it is cursory to simply use the number of business establishments and employees of real estate industry to evaluate housing market prosperity and competition landscape. The biggest problem is that all related companies in this industry did not classified their sales and operation income data by region or county in their annual financial report. Identically, the number of business establishments and employees of residential construction industry cannot accurately reflect suppliers' size and strength. Last but not the least, I developed my own formula for assessing business environment according to my basic and limited knowledge about business operation and real estate investment. However, the formula should be more complicated and comprehensive if researcher utilize more rigorous and scientific approaches for doing this research.

## Analysis and Conclusion



Map 8: California Residential Real Estate Business Environment Assessment

The top ten best counties that have favorable business environment are Alameda, Los Angeles, Santa Barbara, Imperial, Sutter, San Diego, Tuolumne, Orange, Contra Costa, and, Napa. It means that those counties are full of opportunities and proper for entrepreneur to start their new business in residential real estate industry.

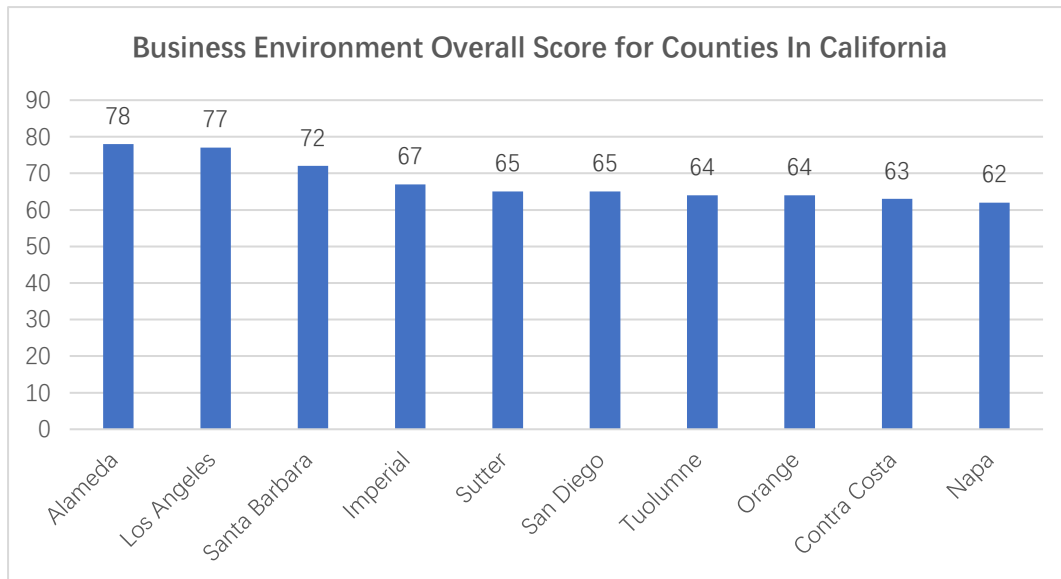


Figure 1: Business Environment Overall Score for Counties in California

Next, I would like to analyze the top three counties from the perspectives of population, housing price, residents' affordability, homeownership rate, household income, industry prosperity and competitive landscape, and, supplier condition.

At first, Alameda received the highest score in this evaluation, which is 78/100. The county seat is Oakland. Alameda County is included in the San Francisco Bay Area, occupying much of the East Bay region. The total population of Alameda County was 1,666,006 making it the 7th-most populous county in the state. Moreover, the population density of Alameda County was 2,254 per sq. mile, which ranked 4th in the state. Higher population and population density represented huge demand for house, which makes Alameda County a massive and profitable market for residential real estate no matter now or in the future. The home price index of Alameda was 222, which ranked 5<sup>th</sup> in California. High HPI shows the

booming of local residential real estate market and growing demand from residents. The mortgage interest amount of Alameda was 1,824,319 thousand dollars and the household income per capita was 46,331 dollars for 2018, which represents strong purchase will and stable affordability from Alameda residents. However, homeownership rate of Alameda is just average in all counties. It suggests that the demand for renting also play an important role in promoting prosperity of residential real estate market. The finally, business activities related to real estate and residential construction are both very active, which demonstrates the recognition and acceptance from capital for the local market.

Secondly, I am not surprised at all about Los Angeles got the second higher score, which is 77/100. Los Angeles County is the most populous county in the United States, with more than 10,175,132 inhabitants and 2,508 people per sq. mile as of 2018. It has 88 incorporated cities and many unincorporated areas and, at 4,083 square miles. Its county seat, Los Angeles, is also California's most populous city and the nation's second largest city with about 4 million people. Undoubtedly, any entrepreneur or investor has no reason to miss the hot land. The home price index of Los Angeles was 246.6, which only lower than San Francisco in California. The inhabitants here are also very rich and affordable. The mortgage interest amount of Los Angeles was 2,588,228 thousand dollars and the household income per capita was 46,331 dollars for 2018. Renting marking



and purchasing market basically split the whole residential real estate market. Moreover, Los Angeles has more than 500 real estate companies and more than 900 residential construction companies. Many big real estate and construction companies also based on LA downtown. The level of commercial prosperity of Los Angeles in real estate industry is evident and obvious.

Thirdly, Santa Barbara is the third highest of overall score chart. Total population and population density are not strength of Santa Barbara. The population of Santa Barbara was 449,645 for 2018 and the population density was 164 per sq. mile. Santa Barbara County comprises the Santa Maria-Santa Barbara, CA Metropolitan Statistical Area. Most of the county is part of the California Central Coast. The HPI and household income of Santa Barbara were just average level in all counties of California. But Santa Barbara has a super high mortgage interest, which was 11,925,123 thousand for 2018. The mortgage interest was more than double amount of the sum of Alameda and Los Angeles. Considering the homeownership rate here is very low. I supposed that many investors came here to invest real property with high leverage. And they can either sell their property when market value of the property substantially rises to acquire excessive return or earn profits from collecting rent rate. It should be noted that Santa Barbara ranked first in the number of business establishment and employees in both real estate industry and residential construction industry.

The data fully illustrates that Santa Barbara has great business environment. Mainstays of the county's economy include engineering, resource extraction (particularly petroleum extraction and diatomaceous earth mining), winemaking, agriculture, and education. The software development and tourism industries are important employers in the southern part of the county. The prosperity of mentioned industry dramatically promotes flourish of residential real estate market and guarantee consumer affordability.

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