

# Where is the best location for our newly opened apartment?

## Introduction

### 1.1. Project Background Statement

We are looking for a place to start up our new apartment in Texas. Texas is growing very fast recently. A lot of constructions are ongoing here and there. New apartments, new restaurants can be found anywhere in Texas. As an individual who have lived in Texas for almost five years, I really feel the development of the State. As a third-populated state in the US, living in Texas is very comfortable and relaxed. The traffic is good here as well as the public transportation system. As the expanding economy and population of Texas, the demand of new apartment is increasing dramatically. Therefore, we believe that a new apartment business in Texas will be profitable and worth investing.

### 1.2. Project Target Statement

In this project, we are going to use Foursquare API to get information and analysis the data we obtained, to make a decision where (which city in Texas) will be the new apartment located.

## Data Collection

In the data collection section, I am going to grab cities' information from internet, including city name, population, household income, criminal rate, etc. Also the numbers of parks, markets, schools, hospitals might be considered in this work or future.

Following are the web links for cities' information:

<https://www.tsl.texas.gov/ref/abouttx/popcity32010.html>

<https://www.indexmundi.com/facts/united-states/quick-facts/texas/median-household-income/cities#table>

<https://www.indexmundi.com/facts/united-states/quick-facts/texas/average-commute-time/cities#table>

<http://www.usa.com/rank/texas-state--crime-index--city-rank.htm?hl=&hlst=&wist=&yr=&dis=&sb=ASC&plow=&phigh=&ps=>

The following table is the first few rows of the cities in Texas with their populations, household incomes, mean travel time, and criminal indexes:

Table 1. Population, household income, mean travel time, and crime index of top 20 cities in TX

	City Name	Population	Household Income Value (\$)	Mean Travel Time (min)	Crime Index
0	Houston	2,099,451	51,140	27.4	3,419
1	San Antonio	1,327,407	50,980	24.4	2,921
2	Dallas	1,197,816	50,100	27.0	3,369
3	Austin	790,390	67,462	24.3	2,455
4	Fort Worth	741,206	59,255	27.2	2,688
5	El Paso	649,121	45,656	22.8	1,496
6	Arlington	365,438	58,502	27.2	2,454
7	Corpus Christi	305,215	55,709	19.2	2,822
8	Plano	259,841	92,121	26.9	1,168
9	Laredo	236,091	43,351	21.1	2,375
10	Lubbock	229,573	48,701	16.4	2,957
11	Garland	226,876	58,999	29.1	1,715
12	Irving	216,290	61,937	24.2	1,688
13	Amarillo	190,695	52,543	17.8	2,932
14	Grand Prairie	175,396	65,249	28.7	1,975
15	Brownsville	175,023	36,499	20.2	1,989
16	Pasadena	149,043	53,331	26.4	1,814
17	Mesquite	139,824	56,074	31.9	1,974
18	Mckinney	131,117	89,964	29.4	1,045
19	Mcallen	129,877	47,279	19.2	1,869
20	Killeen	127,921	50,418	21.9	2,733

From table 1, I observe that the most populated city in TX is Huston, and then San Antonio, Dallas, Austin, and Fort Worth. The information shown here is consistent with the information for web, therefore, the generation of this table is faultless.

## Data Analysis

Basing on the data I collected for the cities in TX state, there are 4 major concerns, population, household income, mean travel time, and crime index. Apparently, large population, high household income, low travel time, and low crime index will make the new-built apartment more likely profitable. Therefore, in the following analysis, I am going to sort out the most appropriate place to build a new apartment.

Table 2. the most appropriate cities (top 5) for building a new apartment

	City Name	Population	Household Income Value (\$)	Mean Travel Time (min)	Crime Index
29	Odessa	99,940	63,145	21.5	2,244
30	Round Rock	99,887	80,637	25.8	949
31	Richardson	99,223	80,953	24.4	1,310
32	Tyler	96,900	49,254	20.6	2,369
33	Lewisville	95,290	63,056	25.4	1,408

Basing on the information from table 2, there are 5 potential options, Odessa, Round Rock, Richardson, Tyler, and Lewisville. The highest population among them is 99940 from Odessa, and the wealthiest household city is Richardson, the safest city is Round Rock, and the least travel time city is Tyler.

By studying the linear relationship between city population and its travel time, household income, and criminal index, a better understanding will be gained. And a good estimation or prediction will be achieved for helping us to choose the right size of a city to live.

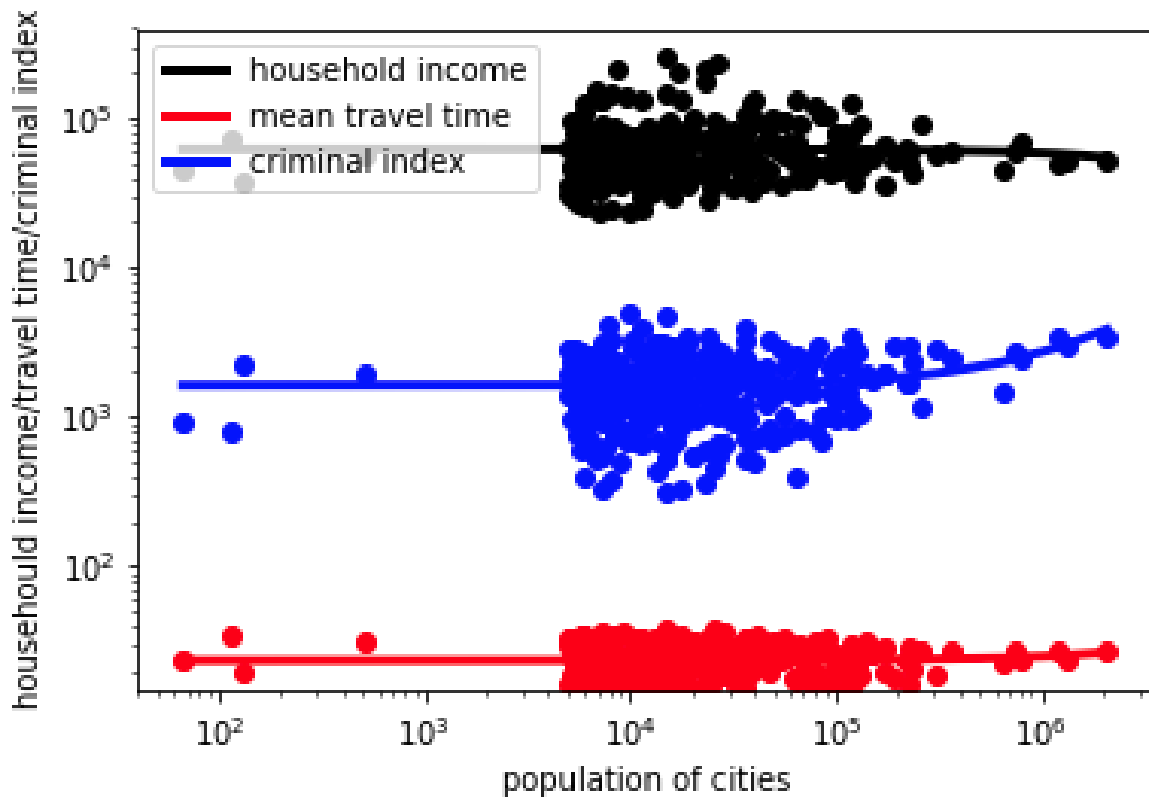


Figure 1. linear relationship between population and household income, travel time, and criminal index.

## Result Discussion

As the data analysis sections shown, I achieve the top 5 candidates for building a new apartment, they are Odessa, Round Rock, Richardson, Tyler, and Lewisville. The highest population among them is 99940 from Odessa, and the wealthiest household city is Richardson, the safest city is Round Rock, and the least travel time city is Tyler. As figure 1 shown, most of the cities have populations in the range of  $10^4$  to  $10^5$  order of magnitude. And the linear regression result shows that household income, travel time, and criminal index have a linear relationship with population. Most Then, by further analyzing the relationship among population, household income, mean travel time, and criminal index, I am able to pick up the most suitable one, Round Rock.

## Future Work

In the future work, the number of hospitals, parks, and other entertainments are willing to be considered to determine which city is the best location for a new apartment. Also, after choosing the city, a more specific analysis basing on the city itself are necessary to choose where is the right location for a new apartment in this chosen city. In this specific analysis, more information around each district need to be analyzed. And it will be a very interesting topic too.