

Finding the Best City to Move to in The United States

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Introduction:

As a young professional on the job market, I have recently realized the huge discrepancy in housing prices for cities around the United States. Typically, the markets with the higher housing costs are also the markets with the higher salaries. I would like to filter through the data to find which cities I would best be able to buy a house. It is important to note that salary vs. housing cost is not the only factor considered to find the best cities to move to; happiness is probably the most important factor when looking for a place to move.

The goal of this project is to build a notebook that helps the user rank potential places to live. The intended user is anyone who is looking to move to a city within the United States.

Inherently, some very important factors will be left out of this analysis. For example, where family and friends live is not taken into account. The local school system is another major factor not considered in this analysis which many users would consider crucial.

Data:

The data used will be coming from three main sources:

Zillow:

- Smoothed, seasonally adjusted measure of the typical home value and market changes
- Typical value for homes within the 65th to 95th percentile range
- All single-family residences and for all homes with 1, 2, 3, 4 and 5+ bedrooms

Download can be found at <https://www.zillow.com/research/data/>

U.S. Bureau of Economic Analysis:

- Income data is counted per person over 18 years old
- Income that people get from wages, proprietors' income, dividends, interest, rents, and government benefits
- A person's income is counted in the county, metropolitan statistical area, or other area where they live, even if they work elsewhere.

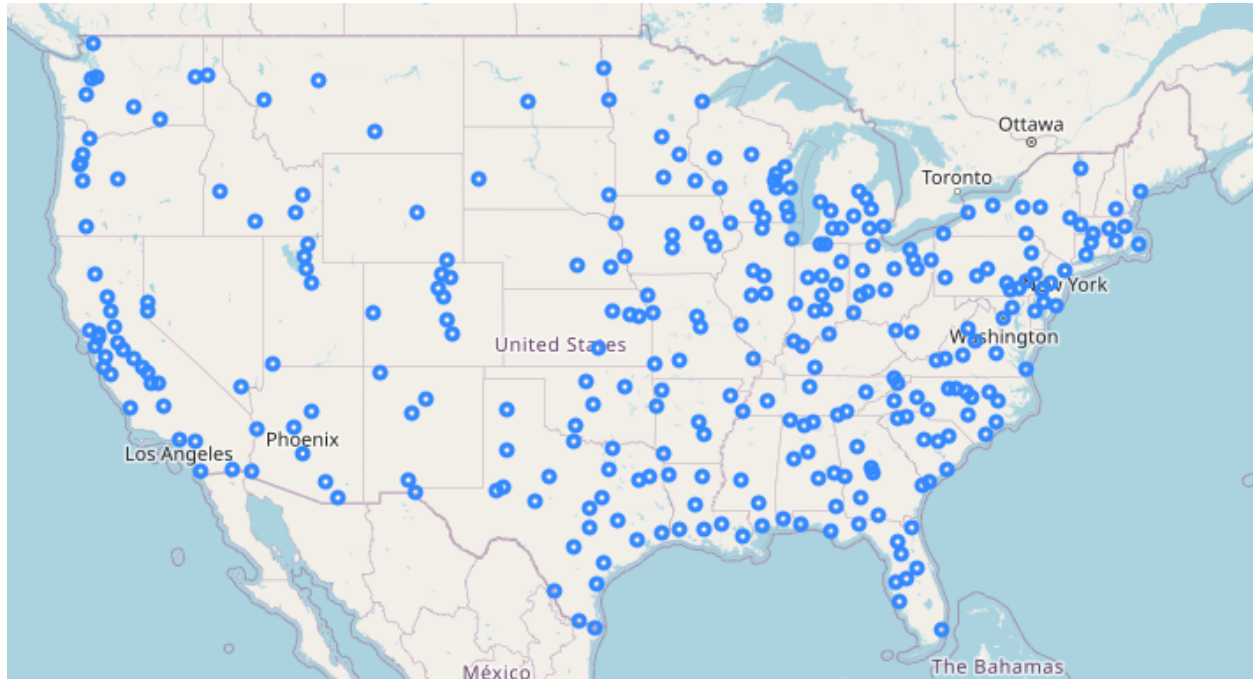
Download can be found at <https://www.bea.gov/data/income-saving/personal-income-county-metro-and-other-areas>

Foursquare:

- Data is pulled from Foursquare to better understand cities
- The number of venues in a city is taken in a 5 mile radius from city center

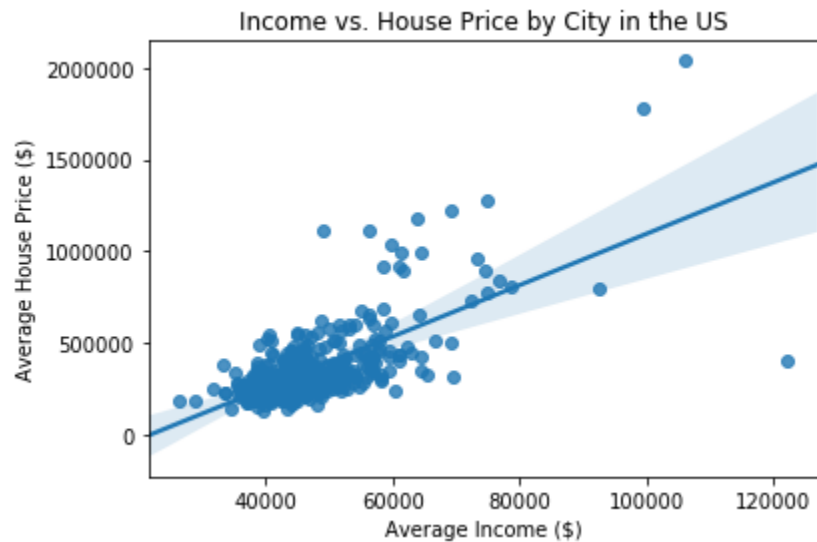
Methodology:

The data pulled from Zillow, the U.S. Bureau of Economics Analysis, and Foursquare needed to be merged to compare data. An inside merge was performed meaning that only common data was kept. This significantly reduced the data set to about 300 cities. Additionally, some data for the cities includes the metroplex while others do not. A map of the cities included in this analysis is shown below. Cities in Hawaii and Alaska with sufficient data were included in the analysis but not shown on the map below.

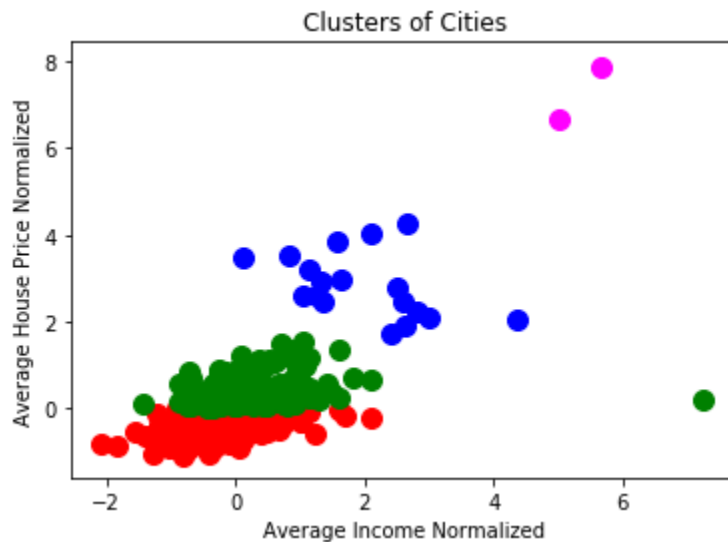


Results:

Average income vs Average House price in each city was plotted to ensure a positive correlation was found. As expected, salary and housing price increase together. There is one point well to the right of the plot below which shows a low house price with a very high salary. That point is Midland, Tx which has it's flaws that will be discussed later.



Cities were separated into four different groups low (red), middle (green), high (blue), and luxury (magenta). The two luxury cities shown below are San Francisco, California and San Jose, California. Neither of these come as a surprise as being places with a high salary and expensive houses.



The question becomes: Does the increase in salary offset the housing cost in these cities? The answer to that question is no. A ratio between income and the home price was used to find your “purchasing power” in each city. The results are shown below.

City	State	Price	Income	group	ratio
Danville	IL	127046	39481	0	3.486525
Midland	TX	407719	122247	2	3.248685
Johnstown	PA	144861	43420	0	3.246598
Decatur	IL	166446	48214	0	3.027512
Charleston	WV	169102	44053	0	2.393062
Midland	MI	236531	60467	0	2.287078
Elmira	NY	177823	44373	0	2.154203
Pine Bluff	AR	141006	34554	0	2.056689
Cumberland	MD	164125	40049	0	2.034098
Beckley	WV	158903	38717	0	2.026190
Enid	OK	183970	44465	0	1.983653
Altoona	PA	194150	46743	0	1.963201
Peoria	IL	205621	48870	0	1.896029
Binghamton	NY	188956	44817	0	1.885409
Youngstown	OH	183475	42443	0	1.758030
Wichita Falls	TX	190257	43527	0	1.702574
Rockford	IL	194078	44328	0	1.694370
Carbondale	IL	178570	40701	0	1.684021
Scranton	PA	204104	46175	0	1.647143
Lima	OH	189356	42816	0	1.644555

The data is heavily skewed to cities in the "low" housing cost and income ranges meaning that these cities can be considered more affordable to the average American.

The issue with this analysis is that it ignores the type of jobs available in each city.

Because I am looking for an engineering job in which I can grow, I will consider cities outside of the 'low' group. Good jobs do exist in these cities, but they would be harder to come across.

The cities with the highest purchasing power are shown below:

	City	State
0	Midland	TX
1	Philadelphia	PA
2	Chicago	IL
3	Houston	TX
4	Richmond	VA
5	Rochester	MN
6	Bismarck	ND
7	Minneapolis	MN
8	Manchester	NH
9	Lancaster	PA

As well as the cities with the least:

	City	State
0	Kahului	HI
1	Salinas	CA
2	San Jose	CA
3	Los Angeles	CA
4	San Francisco	CA
5	Santa Cruz	CA
6	Urban Honolulu	HI
7	Napa	CA
8	San Diego	CA
9	San Luis Obispo	CA

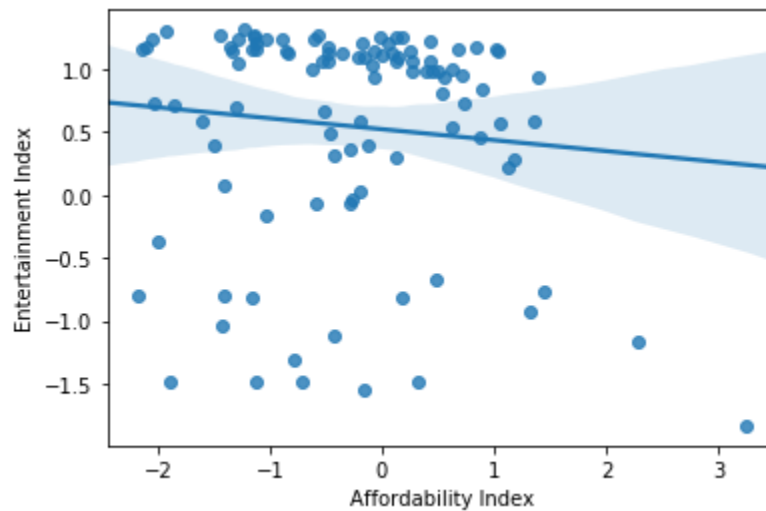
From the analysis, it appears that Midland, TX would be the best city to move to and I should avoid California. As someone who has lived in Midland, TX, I can verify that it is a great place in terms of income and affordability. However, the city was not a good fit in terms of what I was looking for.

At this point, we need to note that there is no single "perfect" city. Everyone will have their own preferences when it comes to where they live. So how can we account for this?

I will attempt to use the Foursquare API to find cities that have a high level of activities for residents. To this I will find the number of venues within 5 miles of downtown. Upon normalizing this, I can have an 'Entertainment Index' for each city. The cities ranked by their entertainment index are shown below:

City	State	Price	Income	Latitude	Longitude	venues
Portland	OR	604574	56991	45.523062	-122.676482	1.310913
San Diego	CA	990231	61386	32.715738	-117.161084	1.292210
Nashville	TN	466126	57953	36.162664	-86.781602	1.273508
Charleston	SC	518133	50958	32.776475	-79.931051	1.273508
Seattle	WA	890430	74620	47.606209	-122.332071	1.273508
Detroit	MI	333691	53086	42.331427	-83.045754	1.254805
New Orleans	LA	335342	52431	29.951066	-90.071532	1.254805
Riverside	CA	547393	40486	33.953349	-117.396156	1.254805
Reno	NV	609448	59639	39.529633	-119.813803	1.254805
Houston	TX	373883	56077	29.760427	-95.369803	1.254805
New York	NY	841231	76681	40.712784	-74.005941	1.236103
San Francisco	CA	1779899	99424	37.774929	-122.419415	1.236103
Austin	TX	573008	58773	30.267153	-97.743061	1.236103
Miami	FL	520652	57228	25.761680	-80.191790	1.236103
Raleigh	NC	449177	55045	35.779590	-78.638179	1.236103
Little Rock	AR	259168	45512	34.746481	-92.289595	1.217400
Cincinnati	OH	317584	54176	39.103118	-84.512020	1.217400
Minneapolis	MN	443157	62889	44.977753	-93.265011	1.198697
Albuquerque	NM	336552	42536	35.085334	-106.605553	1.198697
Philadelphia	PA	421245	64440	39.952584	-75.165222	1.198697
Denver	CO	651878	64287	39.739236	-104.990251	1.198697
San Antonio	TX	342171	46995	29.424122	-98.493628	1.198697
Cleveland	OH	283692	53738	41.499320	-81.694361	1.179995
Charlotte	NC	407311	52176	35.227087	-80.843127	1.179995

So now we need to analyze the Entertainment Index vs the Affordability index. A negative correlation is shown between the two. This makes sense because people sacrifice salaries and pay more for houses in more exciting locations.



Finally, the two metrics had to be multiplied to come up with an overall score for each city. Entertainment was weighted to account for 80% of the metric with affordability being worth 20%. The resulting list of best cities to live is below:

Houston
Philadelphia
Minneapolis
Nashville
Richmond
Raleigh
Chicago
Charlotte
Portland
Miami
Dallas
Charleston
Madison
Baltimore
Austin
Reno
Seattle
New York
Denver
Providence

Discussion:

The methodology used in this analysis is limited and inherently flawed. The city with the lowest rating for where to live was San Luis Obispo, CA which almost anyone would move to in a heartbeat. Overall, I am pleased with the results and I believe they show a relatively good list of the top 20 places to live in the US. Additional information like crime rate, schools, and specific interests would help this analysis.

Conclusion:

Based on the results the best city to move to is **Houston, TX**. This is a reasonable result with the limited data we used. Refinement on this model can lead to better and more personalized results.