



WHICH CITY IS THE BEST TO OPEN A CHINESE RESTAURANT?

A Python Analysis



Chines Food is the most popular foreign food in U.S according to [VOA](#)



So, which U.S city is the best place to open a new one?

- Less Competition
- More Customer

Data Used

- [List of North American cities by population](#)
- Geolocation data of each American city acquired from Nominatim
- [Land Area of U.S cities.](#)
- List of U.S states
- Number of Chinese Restaurants near a specific geolocation acquired from Foursquare API

Methodology

- Find the most populated city in the U.S(population)

	Rank	City	Country	Population	Year
	2	New York City	United States	8,550,405	2015
	3	Los Angeles	United States	3,971,883	2015
	5	Chicago	United States	2,720,546	2015
	6	Houston	United States	2,296,224	2015
	10	Philadelphia	United States	1,567,442	2015
	11	Phoenix	United States	1,563,025	2015
	12	San Antonio	United States	1,469,845	2015
	15	San Diego	United States	1,394,928	2015
	18	Dallas	United States	1,300,092	2015
	26	San Jose	United States	1,026,908	2015
	32	Austin	United States	931,830	2015
	37	Jacksonville	United States	868,031	2015
	39	San Francisco	United States	864,816	2015
	40	Indianapolis	United States	853,173	2015
	41	Columbus	United States	850,106	2015
	42	Fort Worth	United States	833,319	2015
	43	Charlotte	United States	827,097	2015
	58	Seattle	United States	684,451	2015
	60	Denver	United States	682,545	2015
	61	El Paso	United States	681,124	2015
	63	Detroit	United States	677,116	2015
	64	Washington, D.C.	United States	672,228	2015
	66	Boston	United States	667,137	2015

Methodology

- Load the U.S city to Nominatim and find their geolocation data

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The georapical coordinate of NYC, New York, USA are 40.7308619, -73.9871558.
The georapical coordinate of LA, Los Angeles County, California, USA are 34.0536834, -118.2427669.
The georapical coordinate of Chicago, Cook County, Illinois, USA are 41.8755616, -87.6244212.
The georapical coordinate of Houston, Harris County, Texas, USA are 29.7589382, -95.3676974.
The georapical coordinate of Philadelphia, Philadelphia County, Pennsylvania, USA are 39.9524152, -75.1635755.
The georapical coordinate of Phoenix, Maricopa County, Arizona, USA are 33.4485866, -112.0773456.
The georapical coordinate of San Antonio, Bexar County, Texas, USA are 29.4246002, -98.4951405.
The georapical coordinate of San Diego, San Diego County, California, USA are 32.7174209, -117.1627714.
The georapical coordinate of Dallas, Dallas County, Texas, USA are 32.7762719, -96.7968559.
The georapical coordinate of San José, Santa Clara County, California, USA are 37.3361905, -121.8905833.
The georapical coordinate of Austin, Travis County, Texas, USA are 30.2711286, -97.7436995.
The georapical coordinate of Jacksonville, Duval County, Florida, USA are 30.3321838, -81.655651.
The georapical coordinate of SF, California, USA are 37.7792808, -122.4192363.
The georapical coordinate of Indianapolis, Marion County, Indiana, 46204, USA are 39.7683331, -86.1583502.
The georapical coordinate of Columbus, Franklin County, Ohio, USA are 39.9622601, -83.0007065.
The georapical coordinate of Fort Worth, Tarrant County, Texas, USA are 32.753177, -97.3327459.
The georapical coordinate of Charlotte, Mecklenburg County, North Carolina, USA are 35.2270869, -80.8431268.
The georapical coordinate of Seattle, King County, Washington, USA are 47.6038321, -122.3300624.
The georapical coordinate of Denver, Denver County, Colorado, USA are 39.7392364, -104.9848623.
The georapical coordinate of El Paso, El Paso County, Texas, USA are 31.7600372, -106.487287.
The georapical coordinate of Detroit, Wayne County, Michigan, USA are 42.3315509, -83.0466403.
The georapical coordinate of Washington, D.C., USA are 38.8950092, -77.0365625.
The georapical coordinate of Boston, Suffolk County, Massachusetts, USA are 42.3602534, -71.0582912.
The georapical coordinate of Memphis, Shelby County, Tennessee, USA are 35.1490215, -90.0516285.
The georapical coordinate of Nashville-Davidson, Davidson County, Tennessee, USA are 36.1622296, -86.7743531.
The georapical coordinate of Portland, Multnomah County, Oregon, USA are 45.5202471, -122.6741949.
The georapical coordinate of Oklahoma City, Oklahoma County, Oklahoma, USA are 35.4729886, -97.5170536.
The georapical coordinate of Las Vegas, Clark County, Nevada, USA are 36.1662859, -115.149225.
The georapical coordinate of Baltimore, Maryland, 21203, USA are 39.2908816, -76.610759.
The georapical coordinate of Louisville, Jefferson County, Kentucky, USA are 38.2542376, -85.759407.
The georapical coordinate of Milwaukee, Milwaukee County, Wisconsin, USA are 43.0349931, -87.922497.
The georapical coordinate of ABQ, Bernalillo County, New Mexico, USA are 35.0841034, -106.6509851.
The georapical coordinate of Tucson, Pima County, Arizona, USA are 32.2218917, -110.9262353.
The georapical coordinate of Fresno, Fresno County, California, USA are 36.7295295, -119.708861260756.
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Methodology

- Find the U.S city land area

Rank	City	Population	Year	Latitude	Longitude	States	New_Location	Area	
0	1	New York City	8,550,405	2015	40.730862	-73.987156	New York	New York City, New York	303
1	2	Los Angeles	3,971,883	2015	34.053683	-118.242767	California	Los Angeles, California	469
2	3	Chicago	2,720,546	2015	41.875562	-87.624421	Illinois	Chicago, Illinois	228
3	4	Houston	2,296,224	2015	29.758938	-95.367697	Texas	Houston, Texas	600
4	5	Philadelphia	1,567,442	2015	39.952415	-75.163575	Pennsylvania	Philadelphia, Pennsylvania	134
5	6	Phoenix	1,563,025	2015	33.448587	-112.077346	Arizona	Phoenix, Arizona	517
6	7	San Antonio	1,469,845	2015	29.424600	-98.495141	Texas	San Antonio, Texas	461
7	8	San Diego	1,394,928	2015	32.717421	-117.162771	California	San Diego, California	325
8	9	Dallas	1,300,092	2015	32.776272	-96.796856	Texas	Dallas, Texas	341
9	10	San Jose	1,026,908	2015	37.336191	-121.890583	California	San Jose, California	177
10	11	Austin	931,830	2015	30.271129	-97.743700	Texas	Austin, Texas	298
11	12	Jacksonville	868,031	2015	30.332184	-81.655651	Florida	Jacksonville, Florida	747
12	13	San Francisco	864,816	2015	37.779281	-122.419236	California	San Francisco, California	47
13	14	Indianapolis	853,173	2015	39.768333	-86.158350	Indiana	Indianapolis, Indiana	361
14	15	Columbus	850,106	2015	39.962260	-83.000707	Ohio	Columbus, Ohio	217
15	16	Fort Worth	833,319	2015	32.753177	-97.332746	Texas	Fort Worth, Texas	340
16	17	Charlotte	827,097	2015	35.227087	-80.843127	North Carolina	Charlotte, North Carolina	298
17	18	Seattle	684,451	2015	47.603832	-122.330062	Washington	Seattle, Washington	84
18	19	Denver	682,545	2015	39.739236	-104.984862	Colorado	Denver, Colorado	153
19	20	El Paso	681,124	2015	31.760037	-106.487287	Texas	El Paso, Texas	255
20	21	Detroit	677,116	2015	42.331551	-83.046640	Michigan	Detroit, Michigan	139
21	22	Washington, D.C.	672,228	2015	38.895009	-77.036563	District of Columbia	Washington, D.C., District of Columbia	61
22	23	Boston	667,137	2015	42.360253	-71.058291	Massachusetts	Boston, Massachusetts	48
23	24	Memphis	655,770	2015	35.149022	-90.051629	Tennessee	Memphis, Tennessee	315
24	25	Nashville	654,610	2015	36.162230	-86.774353	Tennessee	Nashville, Tennessee	475
25	26	Portland	632,309	2015	45.520247	-122.674195	Oregon	Portland, Oregon	133
26	27	Oklahoma City	631,346	2015	35.472989	-97.517054	Oklahoma	Oklahoma City, Oklahoma	606
27	28	Las Vegas	623,747	2015	36.166286	-115.149225	Nevada	Las Vegas, Nevada	136
28	29	Baltimore	621,849	2015	39.290882	-76.610759	Maryland	Baltimore, Maryland	81
29	30	Louisville	615,366	2015	38.254238	-85.759407	Kentucky	Louisville, Kentucky	325
30	31	Milwaukee	600,155	2015	43.034993	-87.922497	Wisconsin	Milwaukee, Wisconsin	96
31	32	Albuquerque	559,121	2015	35.084103	-106.650985	New Mexico	Albuquerque, New Mexico	188
32	33	Tucson	531,641	2015	32.221892	-110.926235	Arizona	Tucson, Arizona	227

Methodology

- Population / city land area to get population density

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	Rank	City	Population	Year	Latitude	Longitude	States	New_Location	Area	Density
0	1	New York City	8550405.0	2015	40.730862	-73.987156	New York	New York City, New York	784.77	10895.427960
1	2	Los Angeles	3971883.0	2015	34.053683	-118.242767	California	Los Angeles, California	1214.71	3269.819957
2	3	Chicago	2720546.0	2015	41.875562	-87.624421	Illinois	Chicago, Illinois	590.52	4607.034478
3	4	Houston	2296224.0	2015	29.758938	-95.367697	Texas	Houston, Texas	1554.00	1477.621622
4	5	Philadelphia	1567442.0	2015	39.952415	-75.163575	Pennsylvania	Philadelphia, Pennsylvania	347.06	4516.342995
5	6	Phoenix	1563025.0	2015	33.448587	-112.077346	Arizona	Phoenix, Arizona	1339.03	1167.281540
6	7	San Antonio	1469845.0	2015	29.424600	-98.495141	Texas	San Antonio, Texas	1193.99	1231.036273
7	8	San Diego	1394928.0	2015	32.717421	-117.162771	California	San Diego, California	841.75	1657.176121
8	9	Dallas	1300092.0	2015	32.776272	-96.796856	Texas	Dallas, Texas	883.19	1472.041124
9	10	San Jose	1026908.0	2015	37.336191	-121.890583	California	San Jose, California	458.43	2240.054098
10	11	Austin	931830.0	2015	30.271129	-97.743700	Texas	Austin, Texas	771.82	1207.315177
11	12	Jacksonville	868031.0	2015	30.332184	-81.655651	Florida	Jacksonville, Florida	1934.73	448.657435
12	13	San Francisco	864816.0	2015	37.779281	-122.419236	California	San Francisco, California	121.73	7104.378543
13	14	Indianapolis	853173.0	2015	39.768333	-86.158350	Indiana	Indianapolis, Indiana	934.99	912.494251
14	15	Columbus	850106.0	2015	39.962260	-83.000707	Ohio	Columbus, Ohio	562.03	1512.563386
15	16	Fort Worth	833319.0	2015	32.753177	-97.332746	Texas	Fort Worth, Texas	880.60	946.308199
16	17	Charlotte	827097.0	2015	35.227087	-80.843127	North Carolina	Charlotte, North Carolina	771.82	1071.619030
17	18	Seattle	684451.0	2015	47.603832	-122.330062	Washington	Seattle, Washington	217.56	3146.033278
18	19	Denver	682545.0	2015	39.739236	-104.984862	Colorado	Denver, Colorado	396.27	1722.424105
19	20	El Paso	681124.0	2015	31.760037	-106.487287	Texas	El Paso, Texas	660.45	1031.302900
20	21	Detroit	677116.0	2015	42.331551	-83.046640	Michigan	Detroit, Michigan	360.01	1880.825533
21	22	Washington, D.C.	672228.0	2015	38.895009	-77.036563	District of Columbia	Washington, D.C., District of Columbia	157.99	4254.876891
22	23	Boston	667137.0	2015	42.360253	-71.058291	Massachusetts	Boston, Massachusetts	124.32	5366.288610
23	24	Memphis	655770.0	2015	35.149022	-90.051629	Tennessee	Memphis, Tennessee	815.85	803.787461
24	25	Nashville	654610.0	2015	36.162230	-86.774353	Tennessee	Nashville, Tennessee	1230.25	532.095103
25	26	Portland	632309.0	2015	45.520247	-122.674195	Oregon	Portland, Oregon	344.47	1835.599617
26	27	Oklahoma City	631346.0	2015	35.472989	-97.517054	Oklahoma	Oklahoma City, Oklahoma	1569.54	402.249067
27	28	Las Vegas	623747.0	2015	36.166286	-115.149225	Nevada	Las Vegas, Nevada	352.24	1770.801158
28	29	Baltimore	621849.0	2015	39.290882	-76.610759	Maryland	Baltimore, Maryland	209.79	2964.149864
29	30	Louisville	615366.0	2015	38.254238	-85.759407	Kentucky	Louisville, Kentucky	841.75	731.055539
30	31	Milwaukee	600155.0	2015	43.034993	-87.922497	Wisconsin	Milwaukee, Wisconsin	248.64	2413.750804
31	32	Albuquerque	559121.0	2015	35.084103	-106.650985	New Mexico	Albuquerque, New Mexico	486.92	1148.281032
32	33	Tucson	531641.0	2015	32.221892	-110.926235	Arizona	Tucson, Arizona	587.93	904.259010

Methodology

- Population density * pi *(2km)^2 to get number of people living with in 2km radius circle

	Rank	City	Population	Year	Latitude	Longitude	States	New_Location	Area	Density	area_2km	population_2km
0	1	New York City	8550405.0	2015	40.730862	-73.987156	New York	New York City, New York	784.77	10895.4	12.56	136846.224
1	2	Los Angeles	3971883.0	2015	34.053683	-118.242767	California	Los Angeles, California	1214.71	3269.8	12.56	41068.688
2	3	Chicago	2720546.0	2015	41.875562	-87.624421	Illinois	Chicago, Illinois	590.52	4607.0	12.56	57863.920
3	4	Houston	2296224.0	2015	29.758938	-95.367697	Texas	Houston, Texas	1554.00	1477.6	12.56	18558.656
4	5	Philadelphia	1567442.0	2015	39.952415	-75.163575	Pennsylvania	Philadelphia, Pennsylvania	347.06	4516.3	12.56	56724.728

Methodology

- Load geolocation data to Foursquare and find how many Chinese restaurants are within 2km radius circle

```
df12['how_many'] = 'None'
list=[]
for index, row in df12.iterrows():
    neighborhood_latitude = row['Latitude']
    neighborhood_longitude = row['Longitude']
    categoryId = '4bf58dd8d48988d145941735'
    LIMIT = 50
    radius = 2000
    url = 'https://api.foursquare.com/v2/venues/search?client_id={}&client_secret={}&v={}&ll={},{}&radius={}&limit={}&categoryId={}'
    CLIENT_ID,
    CLIENT_SECRET,
    VERSION,
    neighborhood_latitude,
    neighborhood_longitude,
    radius,
    LIMIT,
    categoryId)
    results = requests.get(url).json()
    names = results['response']['venues']
    names = json_normalize(names)
    filtered_columns = ['name', 'location.lat', 'location.lng']
    nearby_venues = names.loc[:, filtered_columns]

    how_many = len(nearby_venues.name)
    list.append(how_many)
df12['how_many'] = list
```

df12

	Rank	City	Population	Year	Latitude	Longitude	States	New_Location	Area	Density	area_2km	population_2km	how_many
0	1	New York City	8550405.0	2015	40.730862	-73.987156	New York	New York City, New York	784.77	10895.4	12.56	136846.224	50
1	2	Los Angeles	3971883.0	2015	34.053683	-118.242767	California	Los Angeles, California	1214.71	3269.8	12.56	41068.688	50
2	3	Chicago	2720546.0	2015	41.875562	-87.624421	Illinois	Chicago, Illinois	590.52	4607.0	12.56	57863.920	49
3	4	Houston	2296224.0	2015	29.758938	-95.367697	Texas	Houston, Texas	1554.00	1477.6	12.56	18558.656	20
4	5	Philadelphia	1567442.0	2015	39.952415	-75.163575	Pennsylvania	Philadelphia, Pennsylvania	347.06	4516.3	12.56	56724.728	50
5	6	Phoenix	1563025.0	2015	33.448587	-112.077346	Arizona	Phoenix, Arizona	1339.03	1167.3	12.56	14661.288	6
6	7	San Antonio	1469845.0	2015	29.424600	-98.495141	Texas	San Antonio, Texas	1193.99	1231.0	12.56	15461.360	8
7	8	San Diego	1394928.0	2015	32.717421	-117.162771	California	San Diego, California	841.75	1657.2	12.56	20814.432	9
8	9	Dallas	1300092.0	2015	32.776272	-96.796856	Texas	Dallas, Texas	883.19	1472.0	12.56	18488.320	10

Methodology

- use population_2km / how_many to get how many people are having one Chinese Restaurants

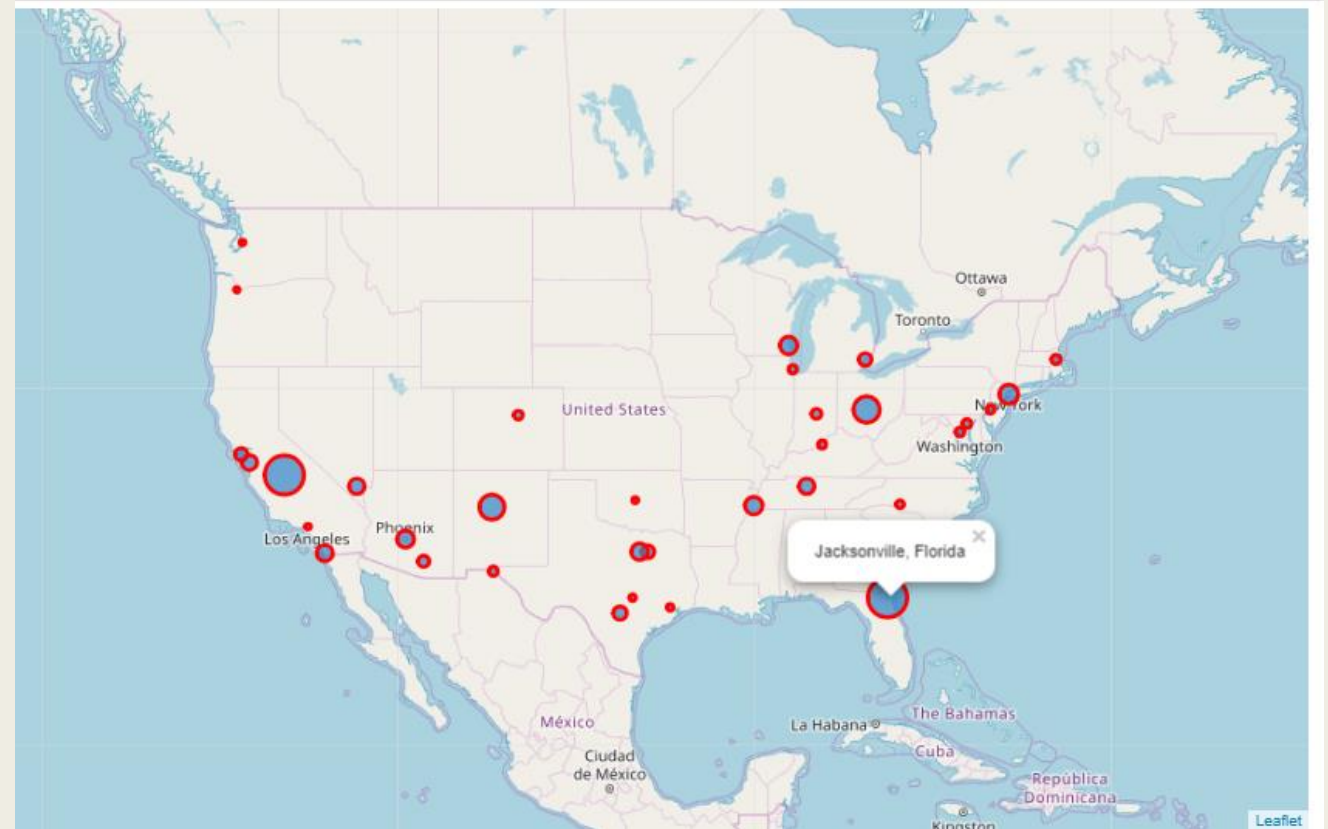
```
df13['person/restaurant'] = df13['population_2km']/df13['how_many']
```

df13

City	Population	Year	Latitude	Longitude	States	New_Location	Area	Density	area_2km	population_2km	how_many	person/restaurant
New York City	8550405.0	2015	40.730862	-73.987156	New York	New York City, New York	784.77	10895.4	12.56	136846.224	50	2736.924480
Los Angeles	3971883.0	2015	34.053683	-118.242767	California	Los Angeles, California	1214.71	3269.8	12.56	41068.688	50	821.373760
Chicago	2720546.0	2015	41.875562	-87.624421	Illinois	Chicago, Illinois	590.52	4607.0	12.56	57863.920	49	1180.896327
Houston	2296224.0	2015	29.758938	-95.367697	Texas	Houston, Texas	1554.00	1477.6	12.56	18558.656	20	927.932800
Philadelphia	1567442.0	2015	39.952415	-75.163575	Pennsylvania	Philadelphia, Pennsylvania	347.06	4516.3	12.56	56724.728	50	1134.494560
Phoenix	1563025.0	2015	33.448587	-112.077346	Arizona	Phoenix, Arizona	1339.03	1167.3	12.56	14661.288	6	2443.548000
San Antonio	1469845.0	2015	29.424600	-98.495141	Texas	San Antonio, Texas	1193.99	1231.0	12.56	15461.360	8	1932.670000
San Diego	1394928.0	2015	32.717421	-117.162771	California	San Diego, California	841.75	1657.2	12.56	20814.432	9	2312.714667
Dallas	1300092.0	2015	32.776272	-96.796856	Texas	Dallas, Texas	883.19	1472.0	12.56	18488.320	10	1848.832000
San Jose	1026908.0	2015	37.336191	-121.890583	California	San Jose, California	458.43	2240.1	12.56	28135.656	13	2164.281231
Austin	931830.0	2015	30.271129	-97.743700	Texas	Austin, Texas	771.82	1207.3	12.56	15163.688	16	947.730500
Jacksonville	868031.0	2015	30.332184	-81.655651	Florida	Jacksonville, Florida	1934.73	448.7	12.56	5635.672	1	5635.672000
San Francisco	864816.0	2015	37.779281	-122.419236	California	San Francisco, California	121.73	7104.4	12.56	89231.264	50	1784.625280
Indianapolis	853173.0	2015	39.768333	-86.158350	Indiana	Indianapolis, Indiana	934.99	912.5	12.56	11461.000	8	1432.625000
Columbus	850106.0	2015	39.962260	-83.000707	Ohio	Columbus, Ohio	562.03	1512.6	12.56	18998.256	5	3799.651200
Fort Worth	833319.0	2015	32.753177	-97.332746	Texas	Fort Worth, Texas	880.60	946.3	12.56	11885.528	5	2377.105600
Charlotte	827097.0	2015	35.227087	-80.843127	North Carolina	Charlotte, North Carolina	771.82	1071.6	12.56	13459.296	12	1121.608000

Methodology

- Load the data to map



Best and Worst Choice to open a new Chinese Restaurant?

■ Best

- *Jacksonville, Florida*
- *5635 people are sharing one Chinese restaurant.*



■ Worst

- *Portland, Oregon*
- *743 people are sharing one Chinese restaurant*

