

Craft Beer Breweries in Washington State

July, 2020

1. Introduction

4 years ago I opened an Instagram business account that I used as a personal blog. Since then I'm documenting all my visits to local breweries around Mexico (Chihuahua, Baja California, CDMX, Guadalajara) and the US (Texas, Washington State, Oregon).

I started my project in Mexico, and then when I move to Washington state 3 years ago I have been continue with this activity around the US being Washington State the headquarters of my blog activity.

I want to continue with my personal blog to try different kind of beers (every single brewery has it's unique and seasonal kind of beer), tell people about the local breweries and crafted beer located around the world, make of this personal blog a profitable business in the future and allow me to travel around the world.

2. Data acquisition and cleaning

Actually, Washington state has 430 breweries around its huge territory. The most located in the Seattle area, according to the Washington state craft beer website (<https://washingtonbeer.com/breweries/>). This website distribute brochures throughout Washington state for tourist or craft beer enthusiasts to visit the breweries located in the state.

Everything is fine so far, but some of the information in the brochures is outdated. So, if you don't know about the breweries located on Washington state or the existence of the web site, you are going to waste a lot of time trying to look for breweries and find that some are already closed or have been moved.

So, to fix this problem I'm going to use the Foursquare API to have updated information about the breweries located in Washington State and in future locations, to update this task and make it easier for further enthusiasts. Also, information about the cities on Washington State.

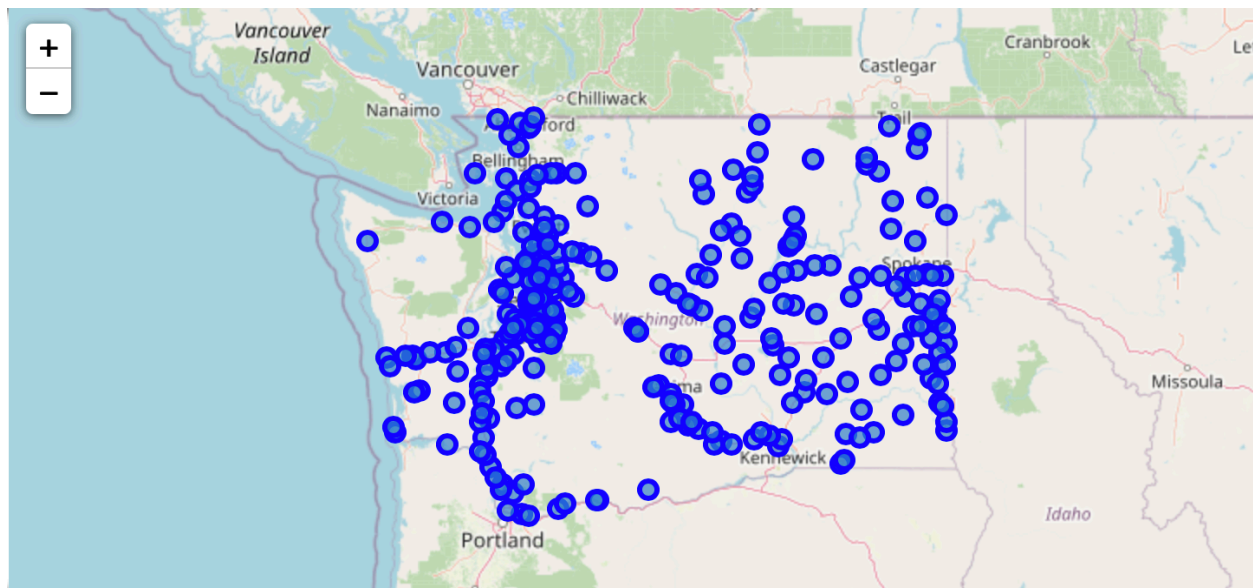
2.1 Data cleaning

Data downloaded or scraped from multiple sources were combined into one table. The necessary data was obtained from Washington Geospatial Open Data Portal <https://geo.wa.gov/> using the request python library. The datasets have a lot of information that is not relevant to my research, so most of the fields were removed to have a cleaner

dataset, and just keep the fields like city name, county, latitude and longitude from the JSON file.

	City Name	County	Latitude	Longitude
0	Aberdeen	Grays Harbor	46.976117	-123.809870
1	Airway Heights	Spokane	47.645849	-117.579228
2	Albion	Whitman	46.791653	-117.251139
3	Algona	King	47.281997	-122.250430
4	Almira	Lincoln	47.710544	-118.937096
...
283	Yacolt	Clark	45.865278	-122.406809
284	Yakima	Yakima	46.592506	-120.549388
285	Yarrow Point	King	47.646051	-122.218170
286	Yelm	Thurston	46.939771	-122.626363
287	Zillah	Yakima	46.408257	-120.272943

One of the problems with the data is that some of the cities in Washington State spans multiple counties, so the dataset shows 288 cities and 39 counties. We need to clean the data to keep just unique values for the cities. We are going to use geopy library to get the latitude and longitude values of Washington State and limit our research just to Washington State are.



The geographical coordinate of Washington State are 47.2868352, -120.2126139.

2.2 Feature Selection

After data cleaning, we have the 281 cities, 39 counties of Washington State and 45 features. Upon examining the meaning of each feature, it was clear that there was some redundancy in the features, so we are going to keep just the four features show in the table above.

3.Methodology

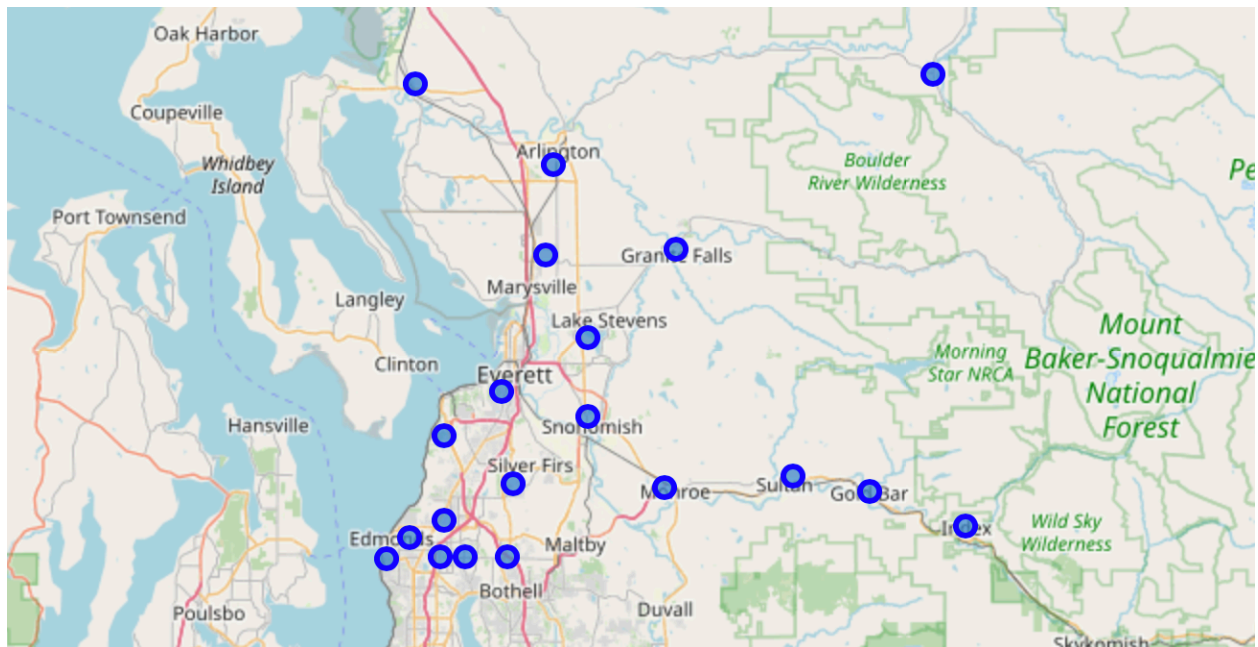
For this project I'm going to request the information from the Foursquare API and manipulate it to get the information about the breweries located in Washington State using the geolocation coordinates and filter by venue category to get all the categories related to "breweries".

The result of the information requested would be divided into counties and in the future filtered and clustered to separate it by cities. Once done a brewery tour can be planned if you want to try different breweries or this is a good idea to start a beer tour business.

The filter for this project was set for Snohomish County (the county where I'm living). Snohomish County has 20 cities and 36 breweries having Everett and Snohomish the most (6 each). Some of the breweries are not listed in the results, this may be because there is a new brewery, small brewery, re-located brewery or there is no review of the brewery yet. Also some breweries were located in the wrong city, this may be due to the closeness of the cities and the geolocation service is locating the breweries in another city.

	City Name	County	Latitude	Longitude
0	Arlington	Snohomish	48.168741	-122.145098
1	Bothell	Snohomish	47.792296	-122.211375
2	Brier	Snohomish	47.792469	-122.273569
3	Darrington	Snohomish	48.254640	-121.603046
4	Edmonds	Snohomish	47.811287	-122.353208
5	Everett	Snohomish	47.950463	-122.220855
6	Gold Bar	Snohomish	47.856446	-121.692088
7	Granite Falls	Snohomish	48.087409	-121.970464
8	Index	Snohomish	47.821483	-121.555939
9	Lake Stevens	Snohomish	48.003001	-122.096194
10	Lynnwood	Snohomish	47.828513	-122.303287
11	Marysville	Snohomish	48.081245	-122.156034
12	Mill Creek	Snohomish	47.863197	-122.203661
13	Monroe	Snohomish	47.859372	-121.985387
14	Mountlake Terrace	Snohomish	47.792111	-122.307655
15	Mukilteo	Snohomish	47.909256	-122.303159
16	Snohomish	Snohomish	47.927838	-122.097608
17	Stanwood	Snohomish	48.244891	-122.342915
18	Sultan	Snohomish	47.870296	-121.804000
19	Woodway	Snohomish	47.790684	-122.384704

Now let's get the latitude and longitude of the city of Snohomish to take it as a reference point and the Washington State map showing Snohomish County and its cities.



The geographical coordinate of Snohomish are 48.0074736, -121.7304882.

Having the information of the City of Snohomish, let's enter our credentials and version to use the foursquare API. The API returns a lot of information related to venues around the City of Snohomish in a radius of 10km (the radius that we look for the search, this radius can be changed).

The result of the search needs to be filtered to remove all the venues that are not relevant to our work and filter only for breweries, resulting in the below table of breweries around 10km from the City of Snohomish.

	City Name	City Latitude	City Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
8	Arlington	48.168741	-122.145098	Whitewall Brewing Company	48.128195	-122.184305	Brewery
25	Arlington	48.168741	-122.145098	Skookum Brewery	48.158907	-122.150649	Brewery
53	Bothell	47.792296	-122.211375	9 Yards Brewery	47.756638	-122.242402	Brewery
56	Bothell	47.792296	-122.211375	Cairn Brewing	47.757219	-122.243891	Brewery
72	Brier	47.792469	-122.273569	Hemlock State Brewing Company	47.784585	-122.308162	Brewery
74	Brier	47.792469	-122.273569	9 Yards Brewery	47.756638	-122.242402	Brewery
76	Brier	47.792469	-122.273569	Diamond Knot Brewpub	47.787882	-122.309850	Brewery
81	Brier	47.792469	-122.273569	Cairn Brewing	47.757219	-122.243891	Brewery
103	Edmonds	47.811287	-122.353208	Salish Sea Brewing Co.	47.809612	-122.376873	Brewery
186	Gold Bar	47.856446	-121.692088	Timber Monster Brewing Company	47.862080	-121.815560	Brewery
255	Lake Stevens	48.003001	-122.096194	Sound To Summit Brewing	47.934339	-122.104799	Brewery
319	Marysville	48.081245	-122.156034	Whitewall Brewing Company	48.128195	-122.184305	Brewery
378	Monroe	47.859372	-121.985387	Adam's Northwest Bistro and Brewery	47.855981	-121.970967	Brewery
393	Mountlake Terrace	47.792111	-122.307655	Diamond Knot Brewpub	47.787882	-122.309850	Brewery
394	Mountlake Terrace	47.792111	-122.307655	Hemlock State Brewing Company	47.784585	-122.308162	Brewery
434	Mukilteo	47.909256	-122.303159	Diamond Knot Brewery & Alehouse	47.948463	-122.304718	Brewery
450	Snohomish	47.927838	-122.097608	Sound To Summit Brewing	47.934339	-122.104799	Brewery
459	Snohomish	47.927838	-122.097608	Sno Town Brewery	47.912780	-122.088969	Brewery
504	Stanwood	48.244891	-122.342915	Naked City Camano Island	48.241595	-122.455324	Brewery
527	Sultan	47.870296	-121.804000	Timber Monster Brewing Company	47.862080	-121.815560	Brewery
545	Woodway	47.790684	-122.384704	Salish Sea Brewing Co.	47.809612	-122.376873	Brewery

4.Results and discussion

Our analysis show that there are a low number of breweries in Snohomish county and all its cities in a radius of 10km. This can be a good start if somebody wants to open a new brewery.

Also, in the Snohomish breweries data frame we can see that some breweries are listed in different cities, this is due to the geographical location, and some breweries are located at the boundaries of two cities.

This analysis was made just as a hobby, if you are looking for a business in craft beer this can be a good beginning. In the case of Washington State there are a lot of information about craft beer, but there are cities into the U.S. that has no much information about it.

Finally, modifying some of the data and some parameters, we can obtain the breweries or data for different venues, cities including countries to continue with different analysis.

5.Conclusion

Purpose of this project was to identify or locate the different Breweries around Washington State areas particularly the once located at Snohomish County (this filter can be modified by change the latitude and longitude of the desired County). Of course like in every big city, a great number of breweries are located in the Seattle area.

The result of the information requested would be divided into counties and in the future filtered and clustered to separate it by cities. Once done, a brewery tour can be planned if you want to try different breweries or this is a good idea to start a beer tour business. That's why is a good idea to work with counties or cities with a low number of breweries.

The filter for this project was set for Snohomish County (the county where I'm living). Snohomish County has 20 cities and 36 breweries having Everett and Snohomish the most (6 each). Some of the breweries are not listed in the results, this may be because there is a new brewery, small brewery, re-located brewery or there is no review of the brewery yet. Also some breweries were located in the wrong city.