Brew Quest

Finding the right Seattle neighborhood for a brewery
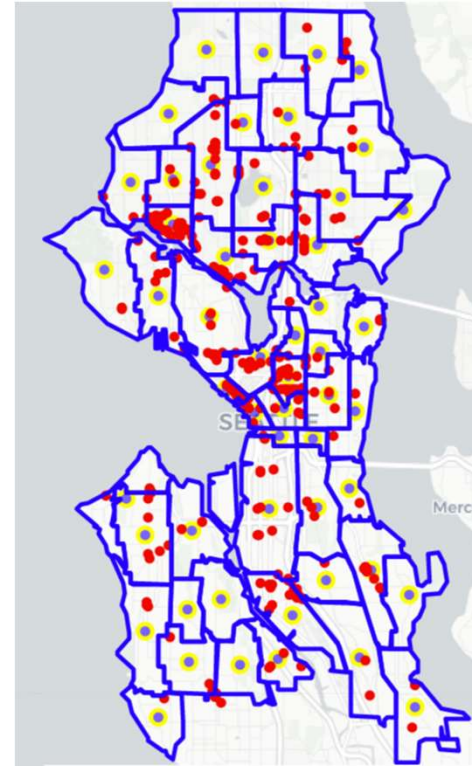
Brewery Success = finding a great neighborhood

- Beer is very popular in the PNW, with over 150 breweries in the Seattle / Tacoma metropolitan area.

- The key to a successful brewery in Seattle is to find a neighborhood with positive attributes:
  - Isn't currently heavily saturated with bars/breweries
  - Has a relatively large population / population density
  - High median income
  - Average rent is not too high

- In order to achieve this, we will leverage various data sources and k-means clustering to explore neighborhood characteristics.

Data Sources

- Utilizing publicly available data from https://data-seattlecitygis.
  - For each neighborhood, the data set includes valuable demographic information including population, area, median income, average rent among other fields from 2013 - 2017.
  - A "centroid" latitude / longitude coordinates were created for each neighborhood as a single, center location to make the analysis a bit easier.

- Utilizing Foursquare API to get bars/breweries near each neighborhood centroid.
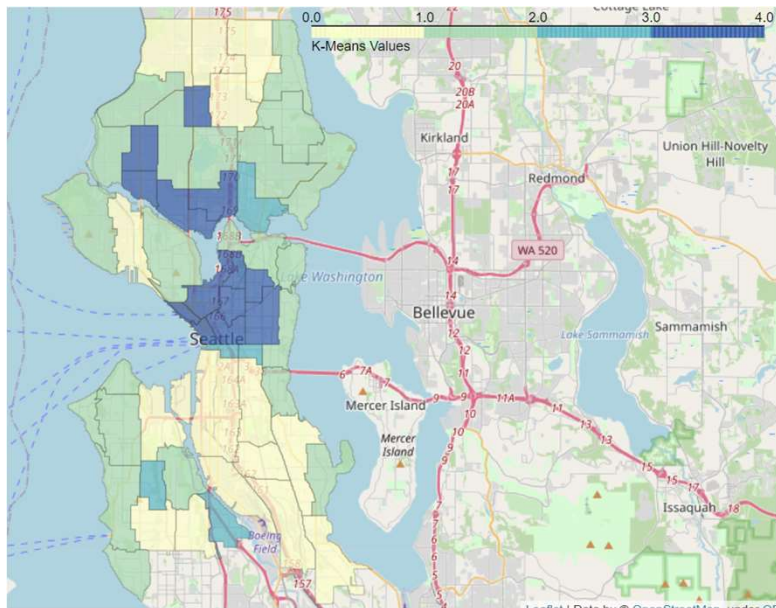
Methodology

- Pull / aggregate bar/brewery locations near each neighborhood

- Find optimal "k" for clustering using Elbow method

- Build k-means neighborhood clusters

- Analyze cluster groups based on bar density, population, income, etc.

- Decide if any clusters meet or base criteria

- Repeat k-means analysis on sub-cluster (if necessary) to narrow potential neighborhoods further
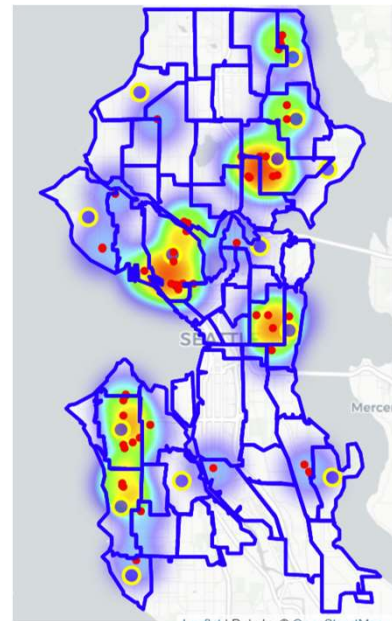
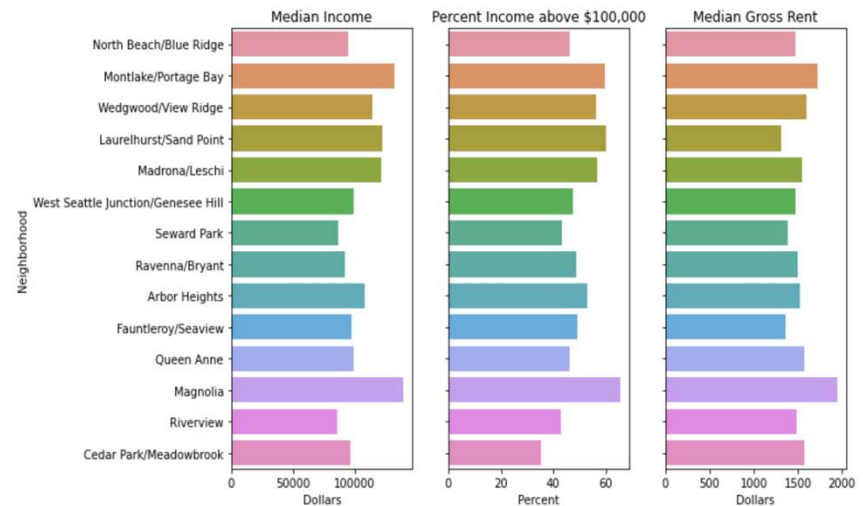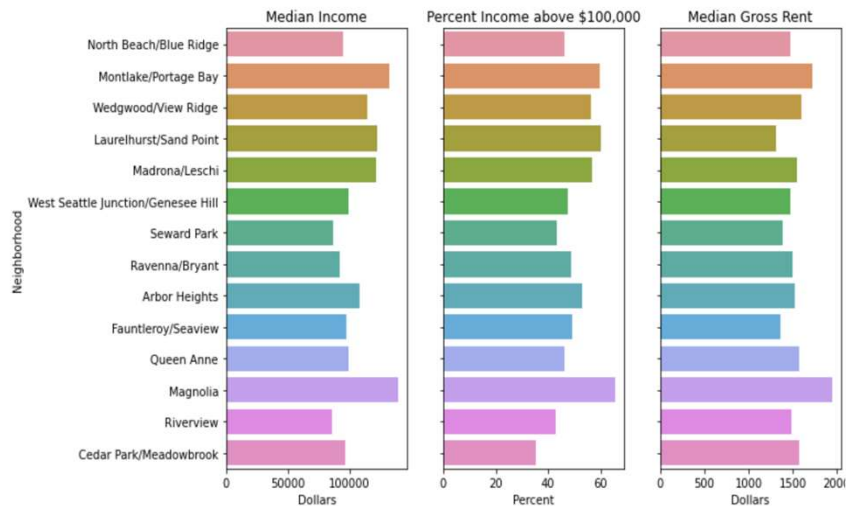| Cluster	Area (Acres)	Area (Sq. Mi.)	Population	Median Income	Median Rent	% HH Income Below $50,000	% HH Income Between $50,000 and $100,000	% HH Income Above $100,000	Population Density (per acre)	Bars	Bar Density
0	1319	2.06	11646	66859	1254	39.3	30.1	30.5	9.4	7.7	0.195
1	1215	1.90	14809	105784	1500	24.7	24.9	50.5	11.8	6.1	0.038
2	518	0.81	8168	38089	983	59.5	20.8	19.8	17.7	9.4	0.141
3	530	0.83	13573	85226	1516	31.0	27.0	42.0	28.0	27.1	0.260

- Initial k-means results (above) indicate Cluster 3 is not a good candidate (over 27 bars / breweries in the area on average)

- Clusters 0 and 2 have a bit higher bar density (Bars / Population)

- Cluster 1 has the largest population, highest median income (but highest median rent)

- Based on the analysis, Cluster 1 neighborhoods were explored further

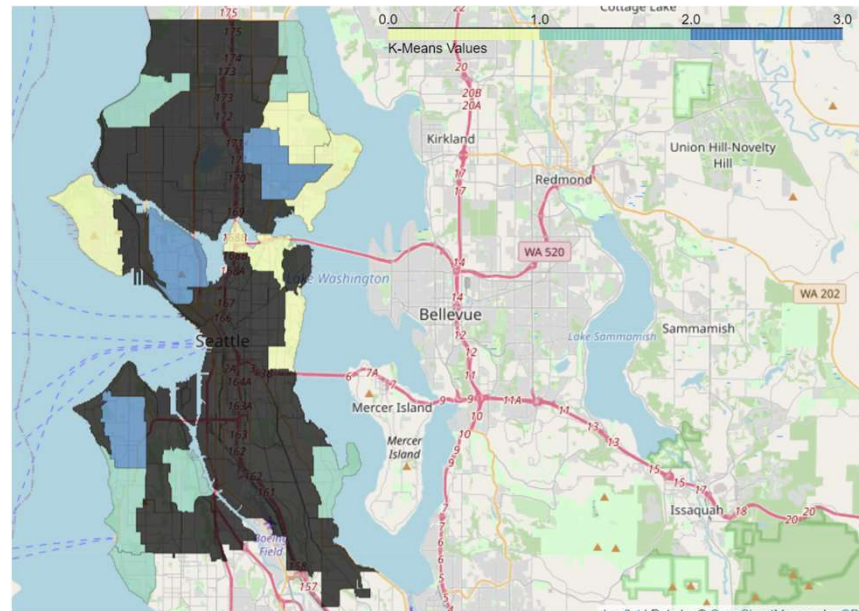Cluster 1 neighborhoods (light green)

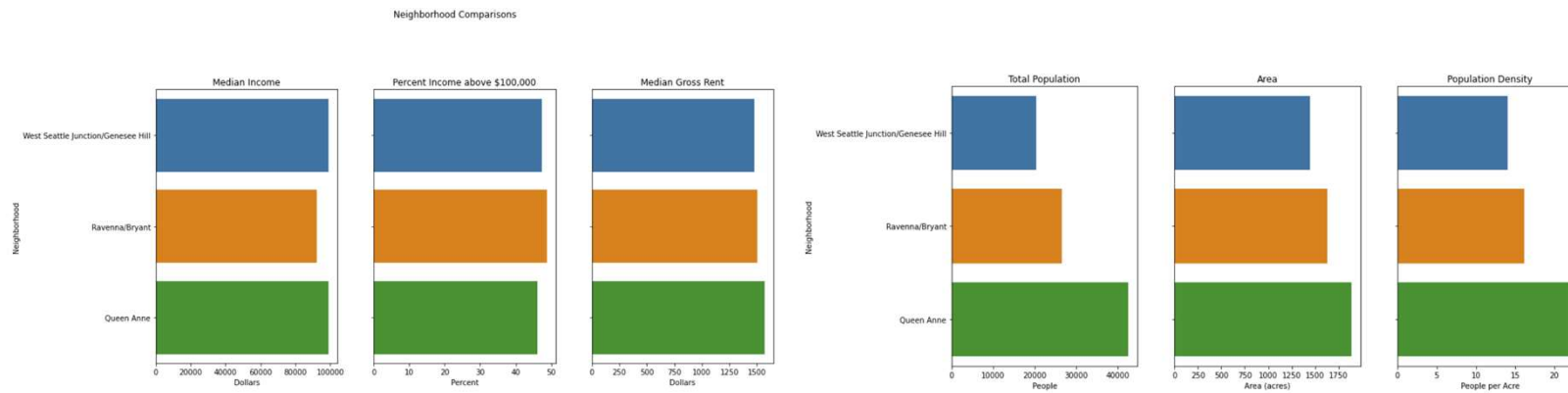Heat map showing bars/breweries in Cluster 1 neighborhoods

- Magnolia is most affluent neighborhood, but most has the most expensive rent

- Montlake/Portage Bay, Wedgewood/View Ridge, Laurelhurst/Sandpoint and Madrona/Leschi share similar qualities

- Queen Anne has high population, population density, but slightly higher rent.

Cluster	Area (Acres)	Area (Sq. Mi.)	Population	Median Income	Median Rent	% HH Income Below $50,000	% HH Income Between $50,000 and $100,000	% HH Income Above $100,000	Population Density (per acre)	Bars	Bar Density
0	1331	2.08	12467	126170	1627	19.2	21.1	59.7	10.0	2.2	0.018
1	1115	1.74	10454	94787	1468	27.0	28.0	45.0	9.1	2.8	0.026
2	1657	2.59	29800	96880	1517	26.0	26.6	47.4	17.6	12.0	0.041

- Since there was no real "slam dunk", k-means clustering was performed again using only Cluster 1 neighborhoods with optimized k=3

- Cluster 0 has highest median income, but much higher rent

- Cluster 1 and 2 have similar economic qualities, but Cluster 2 has much higher population and population density

- Although Cluster 2 has more bars and higher bar density than Cluster 1, we'll explore it further (due to higher population and population density).

Cluster 2 neighborhoods (blue)

Neighborhood Comparisons

- All 3 neighborhoods in Cluster 2 have similar economic characteristics

- Queen Anne has the highest population, area and population density

Results / Conclusion

- Based on the k-means analysis, it is recommended to investigate locations for the brewery further in the Queen Anne neighborhood

- Although more expensive than most Seattle neighborhoods, Queen Anne is a desired neighborhood due to its walkability and proximity to downtown

- Queen Anne is home to "Climate Change Arena", which is currently being renovated to accommodate an expansion NHL hockey team beginning in 2021

- With a renovated arena, there is a high probability that Seattle will attract a relocated or expansion NBA team in the future

- The economic stimulus (sports loving beer drinkers) provided by the renovated arena makes a Queen Anne brewery highly enticing