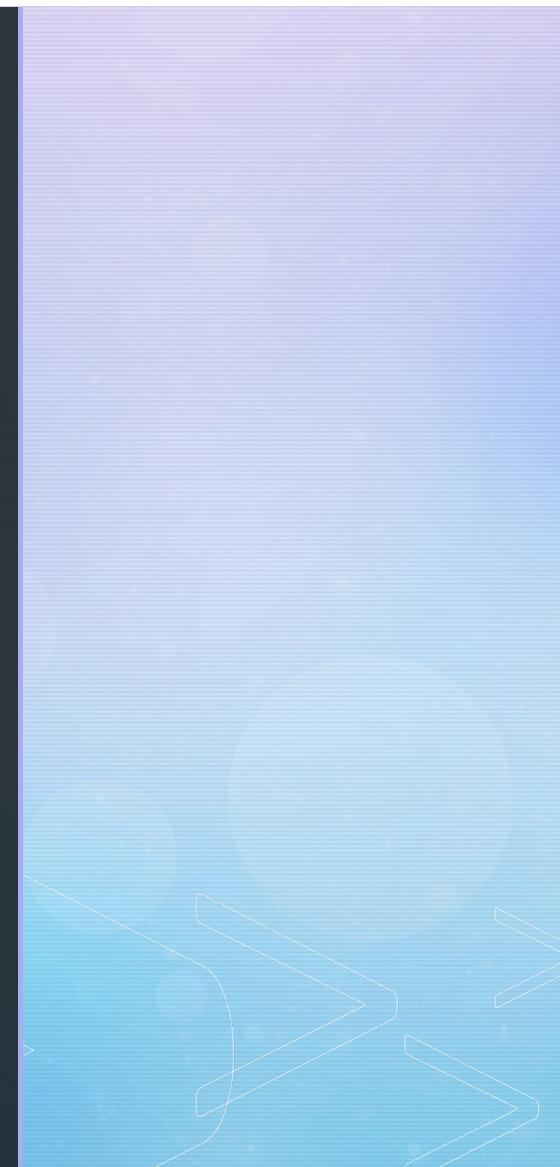


Capstone Project - The Battle of the Neighborhoods





Where to live?

- This is one of the biggest concerns students have when attending college because of the many expenses college students/families have to pay (tuition, parking, school supplies, etc.)
- Receiving a degree with the least amount of debt possible is a significant goal of every college student.
- Figuring out a place to live that help save money is of importance to all students and families that support students
- Project focused on identifying the most cost-efficient neighborhoods around the University of Washington within the city of Seattle for incoming students who are interested in living off campus.



Data Acquisition

- List of neighborhoods retrieved from UW website
(<https://blogs.uw.edu/esom/seattle-living/housing-neighborhoods/>)
- Average rent cost of the listed neighborhoods
(<https://www.rentcafe.com>)
- Crime data from the city of Seattle (: <https://data.seattle.gov>)
- Geopy library for neighborhood coordinates.
- Foursquare API for top venues in each neighborhood

Data Processing

- Data contains 8 features.
(Neighborhood data and crime data)
- Average rent totals and Neighborhood names taken from source(s) and put into data frames.
- Geopy library used to retrieve coordinates

	Neighborhood	City	State	Latitude	Longitude	Avg. rent
1	University District	Seattle	Washington	47.661298	-122.313152	1931
2	Wallingford	Seattle	Washington	47.659463	-122.334342	1997
3	Laurelhurst	Seattle	Washington	47.663432	-122.277070	1931
4	Ravenna	Seattle	Washington	47.675654	-122.297626	1922
5	Roosevelt	Seattle	Washington	47.677305	-122.313807	1909
6	Eastlake	Seattle	Washington	47.643145	-122.326172	2357
7	Wedgwood	Seattle	Washington	47.690253	-122.290811	1909
8	Capitol Hill	Seattle	Washington	47.623831	-122.318369	2052
9	Fremont	Seattle	Washington	47.650453	-122.349986	2072
10	Green Lake	Seattle	Washington	47.680155	-122.324094	2003
11	Mapleleaf	Seattle	Washington	47.701368	-122.294561	1727
12	Lake City	Seattle	Washington	47.719162	-122.295494	1727
13	Central District	Seattle	Washington	47.603110	-122.308270	2484
14	Greenwood	Seattle	Washington	47.690981	-122.354877	1798
15	Ballard	Seattle	Washington	47.676507	-122.386223	2036
16	Montlake	Seattle	Washington	47.641408	-122.303044	1956
17	Sand Point	Seattle	Washington	47.682359	-122.264312	1909

► Data Processing cont.

- Crimes committed before 2018 were dropped.
- Crimes committed at unknown locations were removed.
- Individual crimes condensed into total crimes per neighborhood.
- Neighborhoods relabeled to incorporate all of the neighborhoods that resided in that area

	Neighborhood	Total Crimes
1	ALASKA JUNCTION	273
2	ALKI	47
3	BALLARD	959
4	BEACON HILL	560
5	BELLTOWN	340
6	BITTERLAKE	298
7	BRIGHTON/DUNLAP	177
8	CAPITOL HILL	884
9	CENTRAL DISTRICT	312
10	CHINATOWN/INTERNATIONAL DISTRICT	472
11	CLAREMONT/RAINIER VISTA	57
12	COLUMBIA CITY	82
13	COMMERCIAL DUWAMISH	4
14	COMMERCIAL HARBOR ISLAND	6
15	DELRIDGE	158
16	DOWNTOWN COMMERCIAL	1465

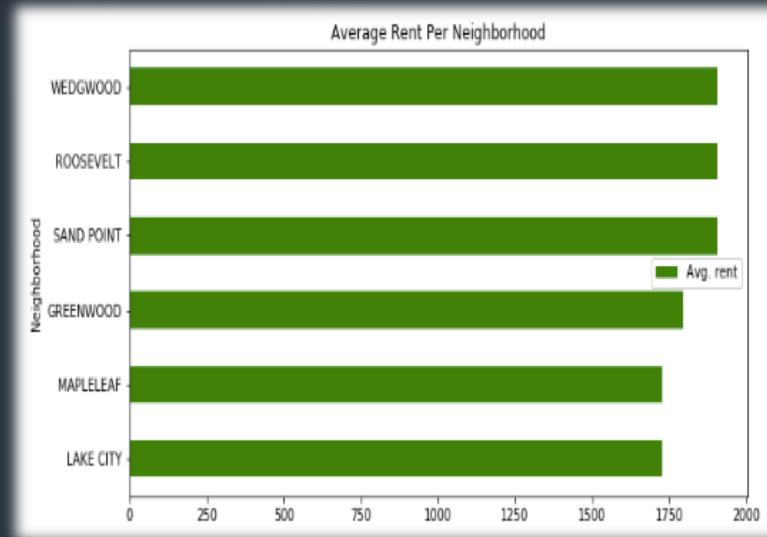
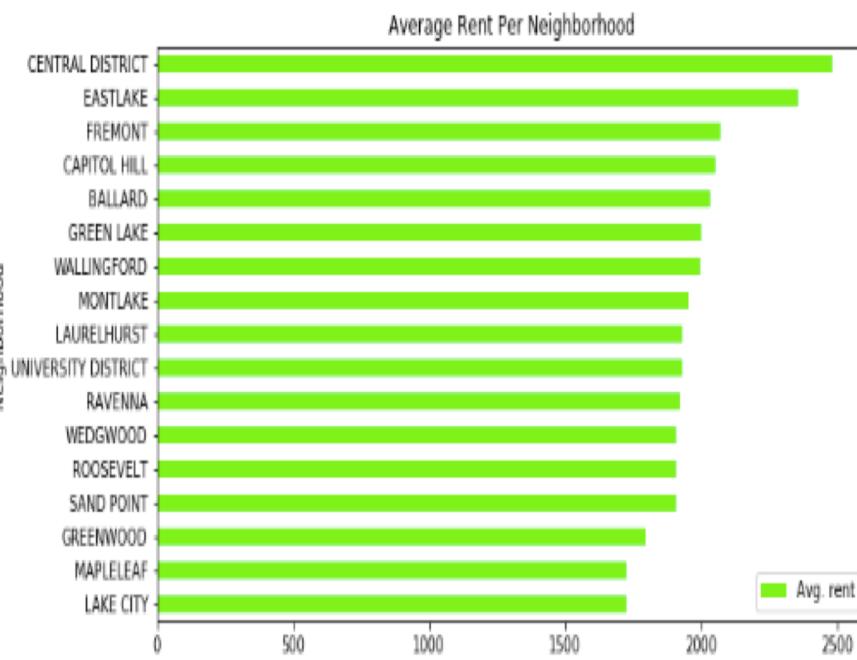
Foursquare

- Used neighborhoods' geographical coordinates and Foursquare API to get information on the venues within them
- Foursquare was used to find venues in each neighborhood within a 700 meter radius.
- Top 10 venues within each neighborhood were found

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	LAKE CITY	47.719162	-122.295494	Elliott Bay Public House & Brewery	47.720373	-122.295006	Pub
1	LAKE CITY	47.719162	-122.295494	Dick's Drive-In	47.718225	-122.296776	Burger Joint
2	LAKE CITY	47.719162	-122.295494	2C Thai	47.719528	-122.295030	Thai Restaurant
3	LAKE CITY	47.719162	-122.295494	Thai One On	47.718673	-122.295689	Thai Restaurant
4	LAKE CITY	47.719162	-122.295494	Korochka	47.718594	-122.295475	Gastropub

Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
BALLARD	18	18	18	18	18	18
CAPITOL HILL	100	100	100	100	100	100
CENTRAL DISTRICT	45	45	45	45	45	45
EASTLAKE	38	38	38	38	38	38
FREMONT	100	100	100	100	100	100
GREEN LAKE	50	50	50	50	50	50
GREENWOOD	55	55	55	55	55	55
LAKE CITY	38	38	38	38	38	38
LAURELHURST	16	16	16	16	16	16

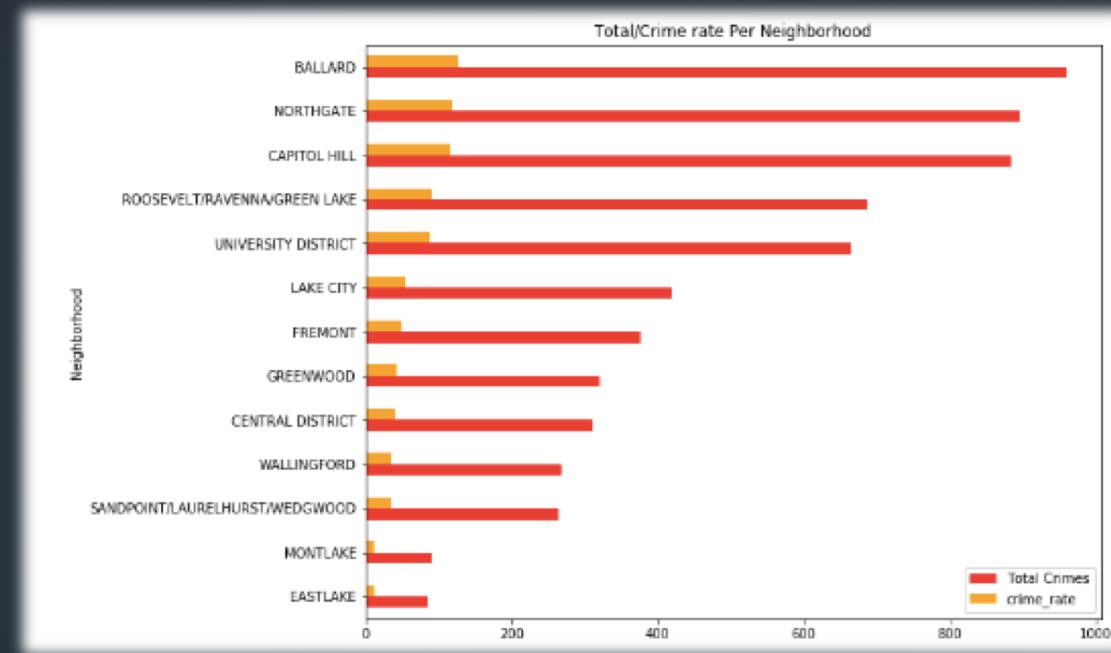
Comparison of Average Rent costs



- Lake City, Mapleleaf, Greenwood, Sand Point, Roosevelt and Wedgwood were the cheapest out of the group of neighborhoods compared

Crime rate/total as a basis neighborhood safety

- Crime rate/totals varied significantly amongst neighborhoods
- More crimes committed in areas with a dense population (possible influence)
 - 30,908 residents in Capitol Hill
 - 24,384 residents in Ballard
 - 50,289 residents in the Northgate area

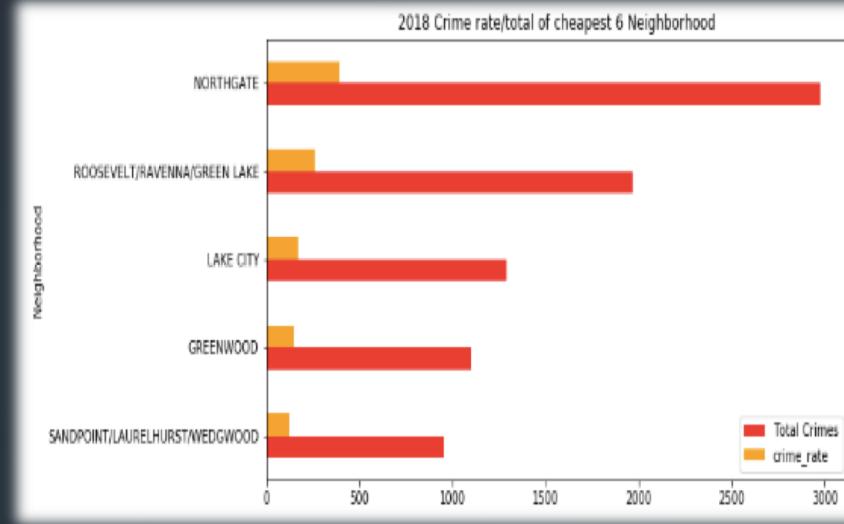
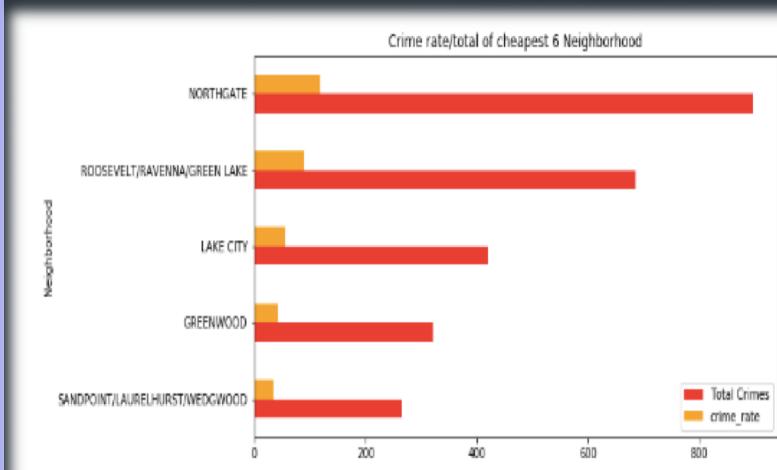


Results

- Narrowed focus to six cheapest neighborhoods
- Clusters:
 - Cluster 1(0): common venue were places that sell food.
 - Cluster 2(1): common venue were recreational venues.
 - Cluster 3(2): No common venue.
 - Cluster 4(3): Common venue were places of food
- Four out of the six neighborhoods placed in cluster 1 (0) ,

Neighborhood	LAKE CITY	MAPLELEAF	GREENWOOD	SAND POINT	ROOSEVELT	WEDGWOOD
City	Seattle	Seattle	Seattle	Seattle	Seattle	Seattle
State	Washington	Washington	Washington	Washington	Washington	Washington
Latitude	47.7192	47.7014	47.691	47.6824	47.6773	47.6903
Longitude	-122.295	-122.295	-122.355	-122.264	-122.314	-122.291
Avg. rent	1727	1727	1798	1909	1909	1909
Cluster Labels	0	2	0	1	0	0
1st Most Common Venue	Pharmacy	Bus Line	Coffee Shop	Park	Coffee Shop	Park
2nd Most Common Venue	Bank	Marijuana Dispensary	Mexican Restaurant	Soccer Field	Bar	Coffee Shop
3rd Most Common Venue	Mexican Restaurant	Liquor Store	Spa	Playground	Vegetarian / Vegan Restaurant	Pub
4th Most Common Venue	Thai Restaurant	Furniture / Home Store	Bookstore	Tennis Court	Burger Joint	Pharmacy
5th Most Common Venue	Pub	Tennis Court	Mediterranean Restaurant	Trail	Gym / Fitness Center	Supermarket
6th Most Common Venue	Pizza Place	Automotive Shop	Playground	Indie Movie Theater	Grocery Store	ATM
7th Most Common Venue	Shipping Store	Auto Garage	Pizza Place	Rugby Pitch	Rental Car Location	Grocery Store
8th Most Common Venue	Sandwich Place	Lake	Bar	Dog Run	Pub	Video Store
9th Most Common Venue	Breakfast Spot	Pub	Sandwich Place	Food Truck	Pizza Place	Gym
10th Most Common Venue	Brewery	Pool	Lounge	Theater	Pet Store	Italian Restaurant

Crime rate of six cheapest neighborhood



- The crime rate in the six cheapest neighborhoods currently and previously year are characteristically consistent.
- Sand Point/Laurelhurst/Wedgwood had the lowest crime rate whereas Northgate obviously having the largest.

Conclusion and future directions

- Identified the most cost-efficient neighborhoods within a four-mile radius (North, South, East, West) of the UW Medical Center/UWSOM on campus in the city of Seattle.
- More factors can be under scope of analysis:
 - Travel Distance
 - Travel times during usual class hours
 - Historical economy data on neighborhood average rent characteristics