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Submission date: 16th June,2020

Capstone Project: Observing data of 2 cities along with foursquare api

Project: Anchorage and Missoula- Examining for preference on business or residence

Introduction:

Background:

Alaska and Montana are 2 states in United States which are quite similar compared to location and weather conditions. Although the states may differ considering few other features. For the project, 2 important cities, each from both states would be used for observation which may be useful for finding answers to some questions involving choice. The cities are: Anchorage(Alaska) and Missoula(Montana).

Anchorage is the largest city in Alaska located in south-central part of the state on the Cook Inlet. It's known for its cultural sites, including the Alaska Native Heritage Center, which displays traditional crafts, stages dances, and presents replicas of dwellings from the area’ s indigenous groups.

Missoula is a city in the U.S. state of Montana; it is the county seat of Missoula County. It is located along the Clark Fork River near its confluences with the Bitterroot and Blackfoot Rivers in western Montana and at the convergence of five mountain ranges, thus it is often described as the "hub of five valleys".

Both cities may be considered an option to set up business, start residence or a choice for tourism. Both cities have impressive records on education, economy,history,etc. Some the data would be used for modelling to have a clear idea about the cities and decide what would be better regarding the location.

Problem:

For the project, 2 problems are included for examining the data.
1) Which city would be better for setting up a business
2) Which city would be better for residence

Both the problems would require the use of foursquare api since both involves dealing with location data.

Who may be interested:

As the questions show, the project results may be helpful for business owners, researchers or anyone planning to move to the cities.

Data collection and processing:

Data:

Relevant datasets which seemed useful for project are:

1) Temperature or weather conditions
2) Household income
3) Economy
4) Employment rate
5) Transportation
6) Education
7) Crime
8) Health
9) Poverty

Most of the datasets have been taken from ‘datausa.io’ while other datasets have been taken from ‘wikipedia.org’ and ‘microtrends.net’. The datasets were cleaned and filtered, comparing the 2 cities.

Data processing:

For processing the data python(jupyter notebook) was used using foursquare and other packages including folium for mapping of data with location. Foursquare would be used for filtering the locations and examining the dataset with the location values. Clustering was also performed to rank the neighborhood regarding relevant fields.

Methodology:

Problems and solutions:

For both the problems, most of the datasets would be used. Some of the data models have not been modelled using python since the models were already available, while other models have been prepared and included in the jupyter notebook. Most of the datasets were shaped and filtered for simplicity. Also, along with the model, the foursquare api has been used to verify few results. Also, some clustering techniques have been used to filter the results. Many machine learning techniques have also been used which would be mentioned while displaying the results.

For both the problems, the foursquare api was used to verify the results.

<u>So, starting with the first question:</u>

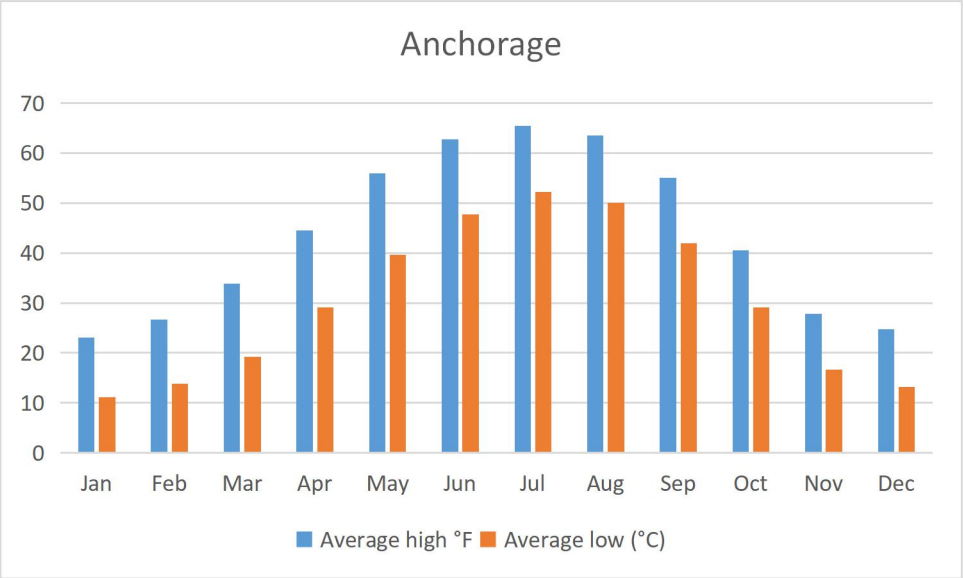
Which city would be a better place for residence?

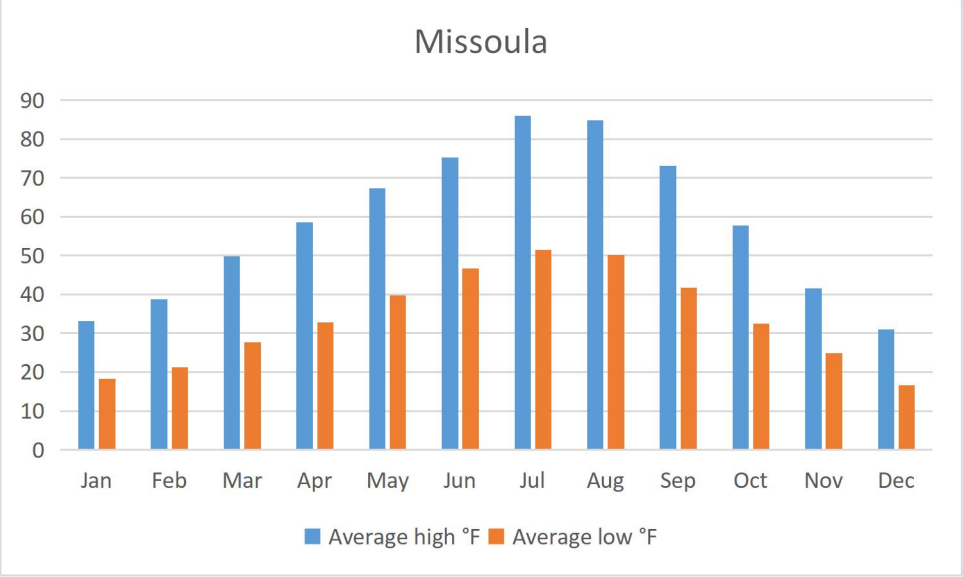
For the problem, several factors may be considered, for example: how is the weather condition. Is it cold or very cold, or warm? How is the neighborhood(household income). Is job available in the area? Is the transportation suitable? What is the progress of education in the place? How secure is the city? Or is the medical service good in the city?

For the several questions which may be factors affecting residency, the data was visualized for understanding the effects more clearly.

1) Temperature and weather conditions

Data shows that temperature is generally larger for anchorage

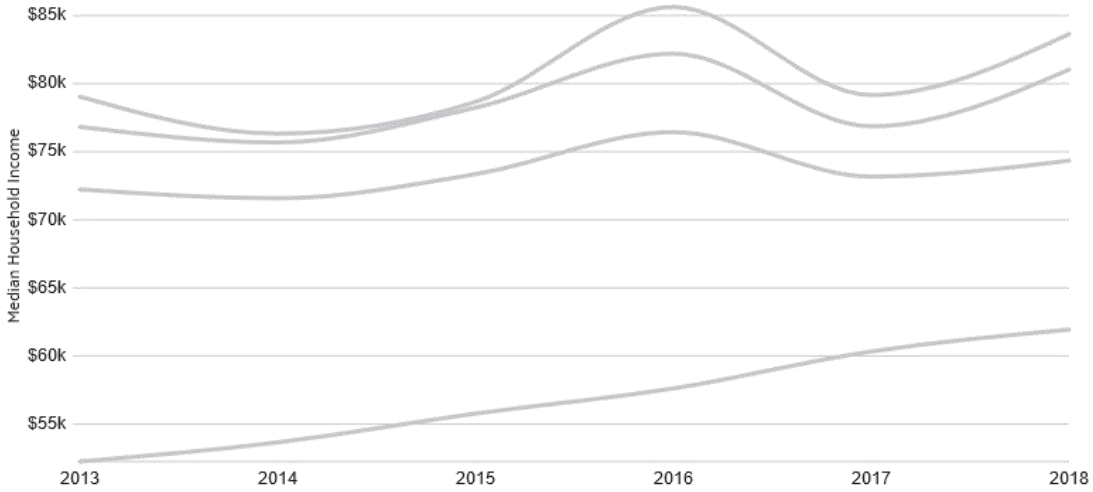


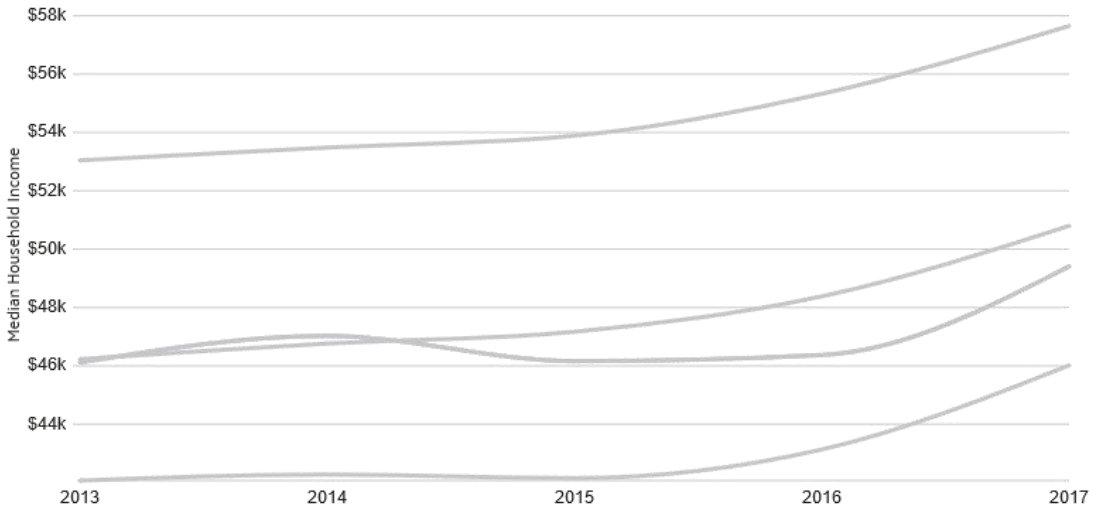


2) Household income(Anchorage vs Missoula)

Median household income

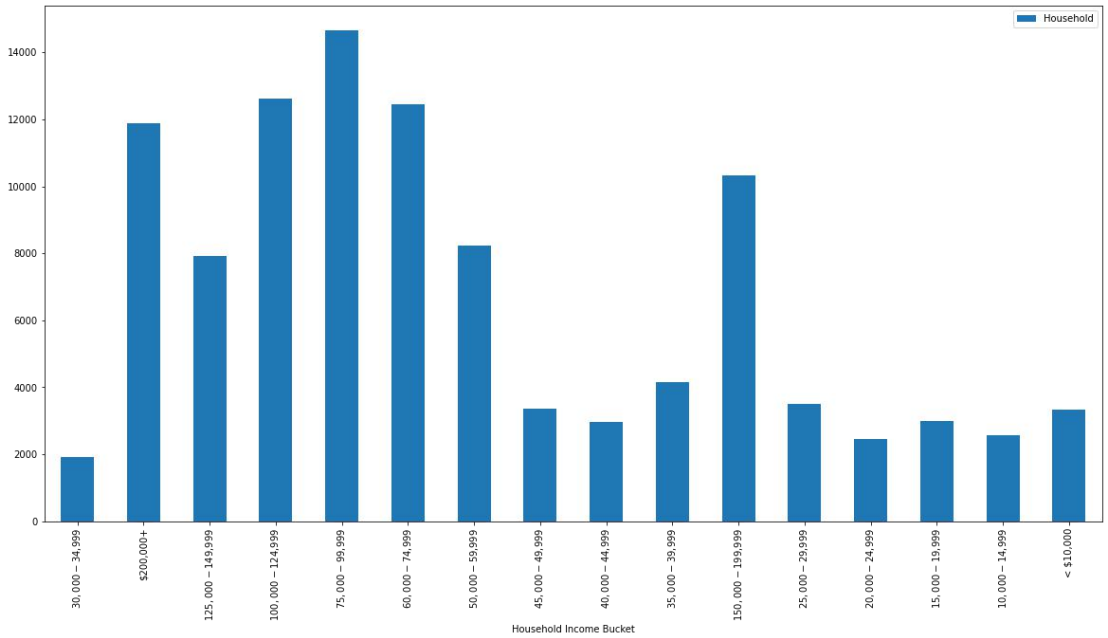
Data shows that median household income is generally higher in Anchorage compared to Missoula

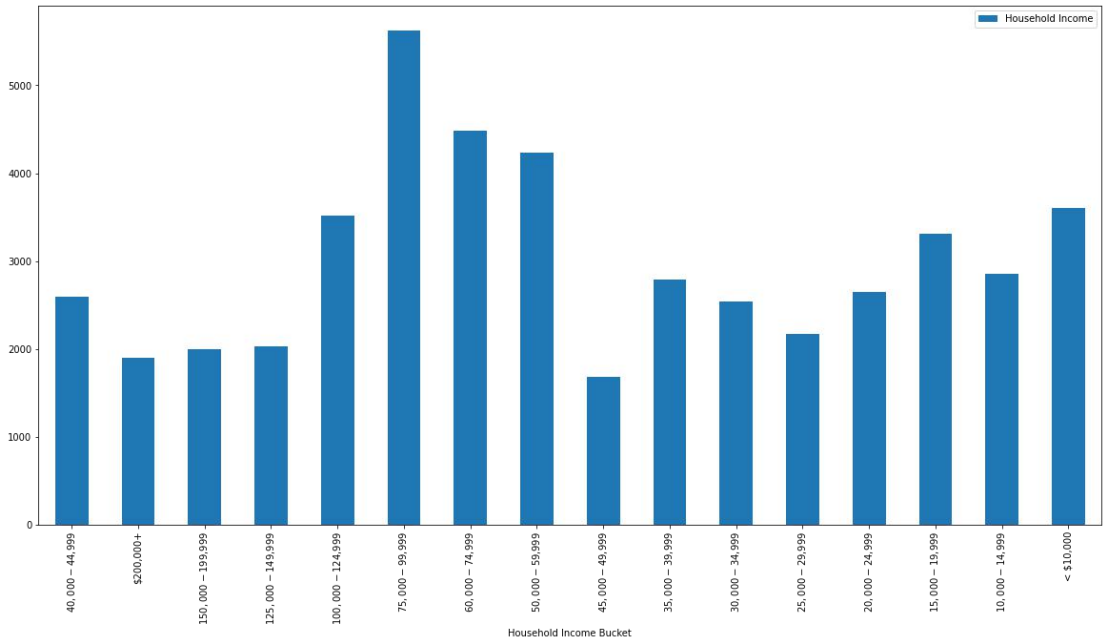




3) Household income(Anchorage vs Missoula)

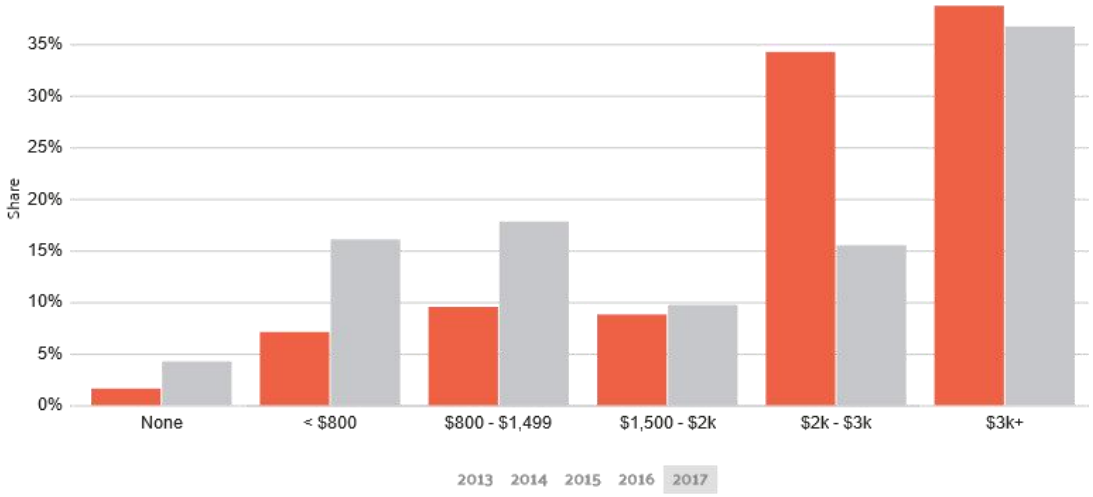
The household income is also higher in Anchorage for higher ranges of income





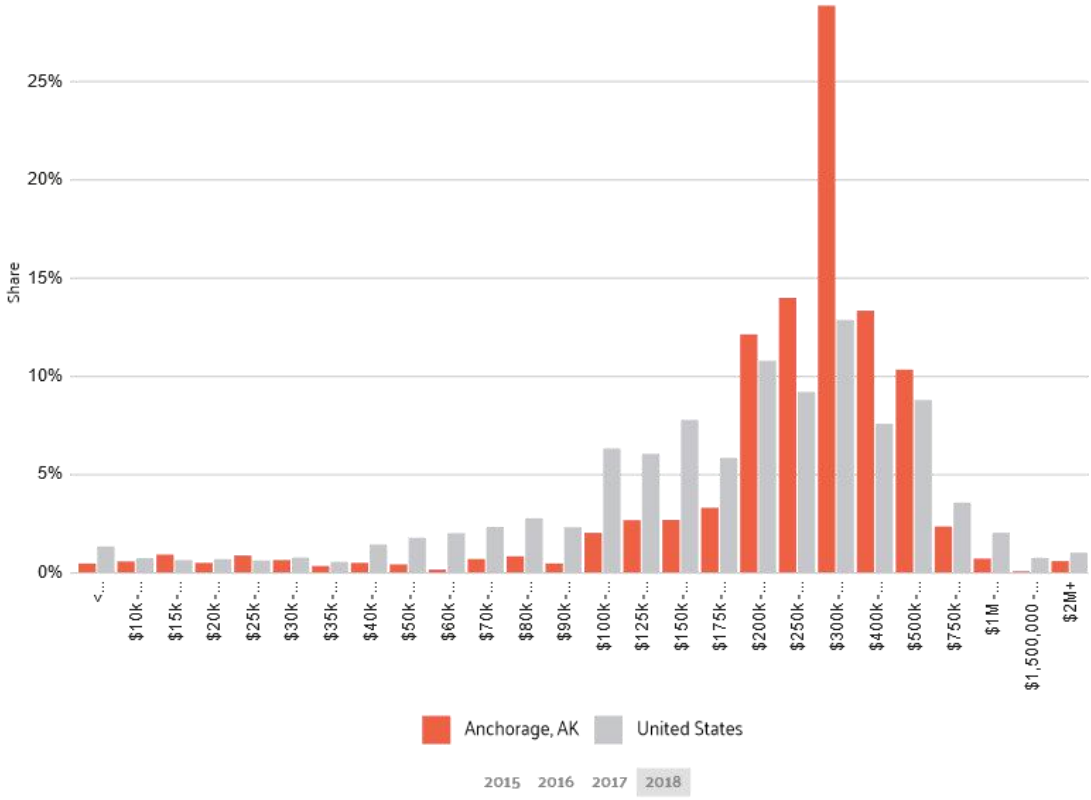
Property tax(Anchorage vs Missoula)

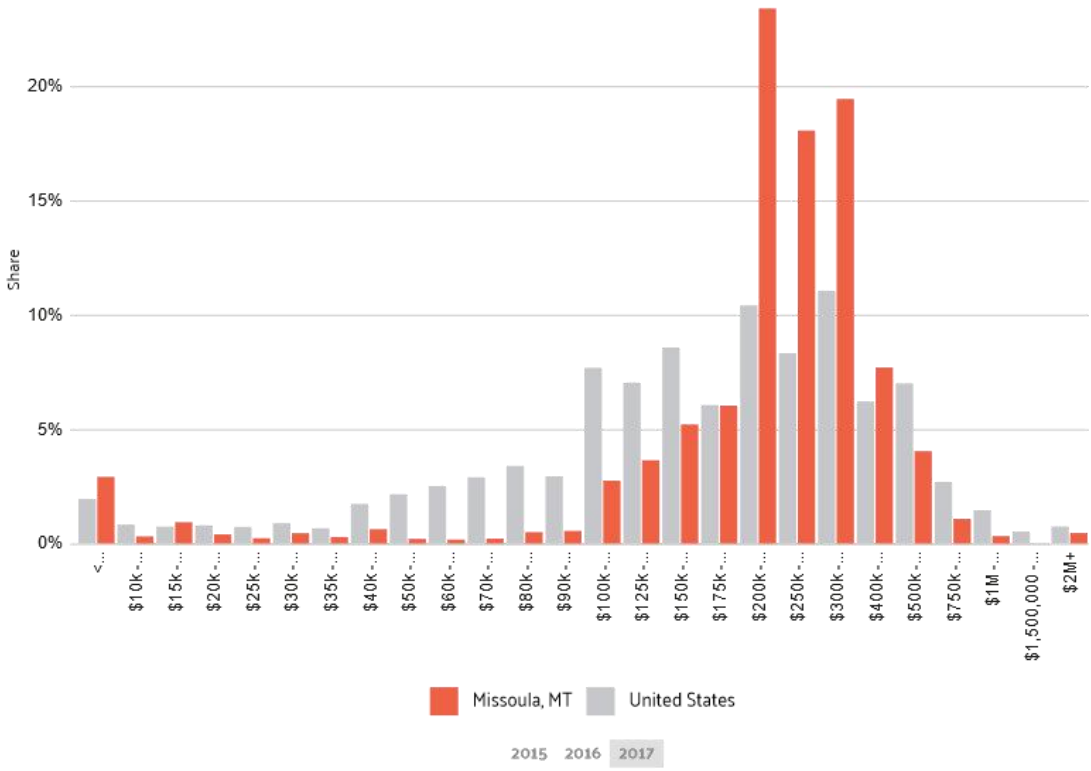
Property tax is generally lower for Anchorage if range is from 0-$2k but higher for amount more than $2k



Property value(Anchorage vs Missoula)

Property value is a little higher in Anchorage compared to Missoula

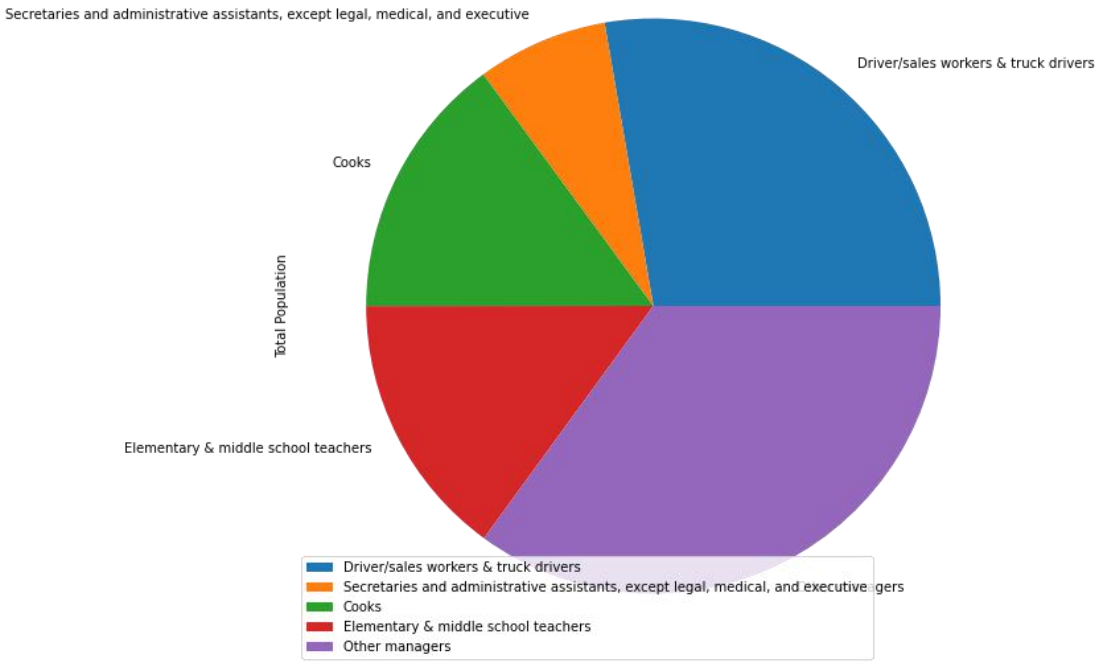


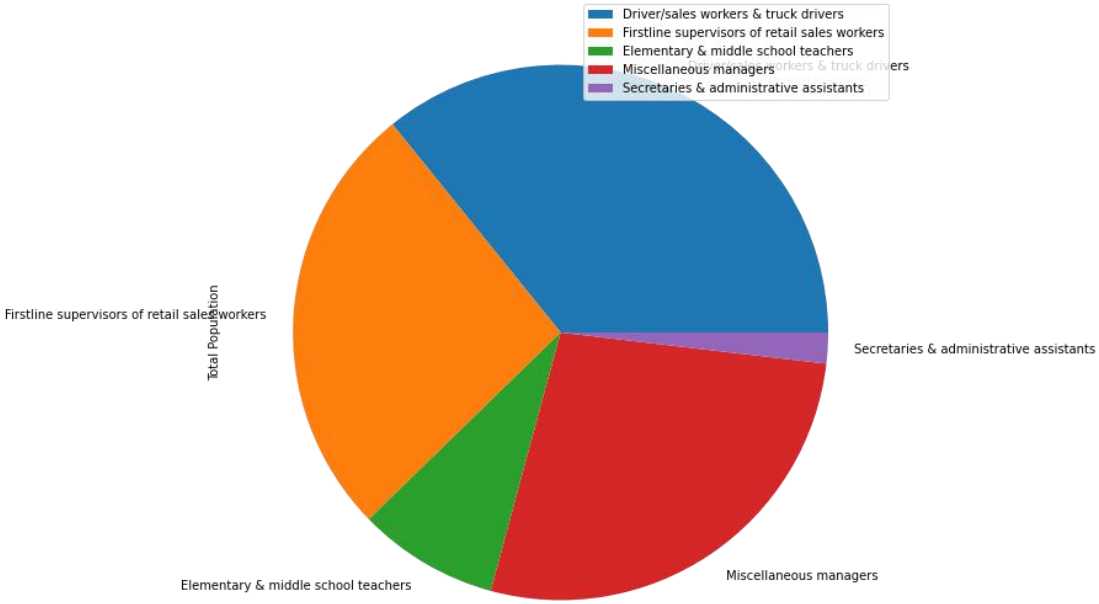


4) Employment rate(Anchorage vs Missoula)

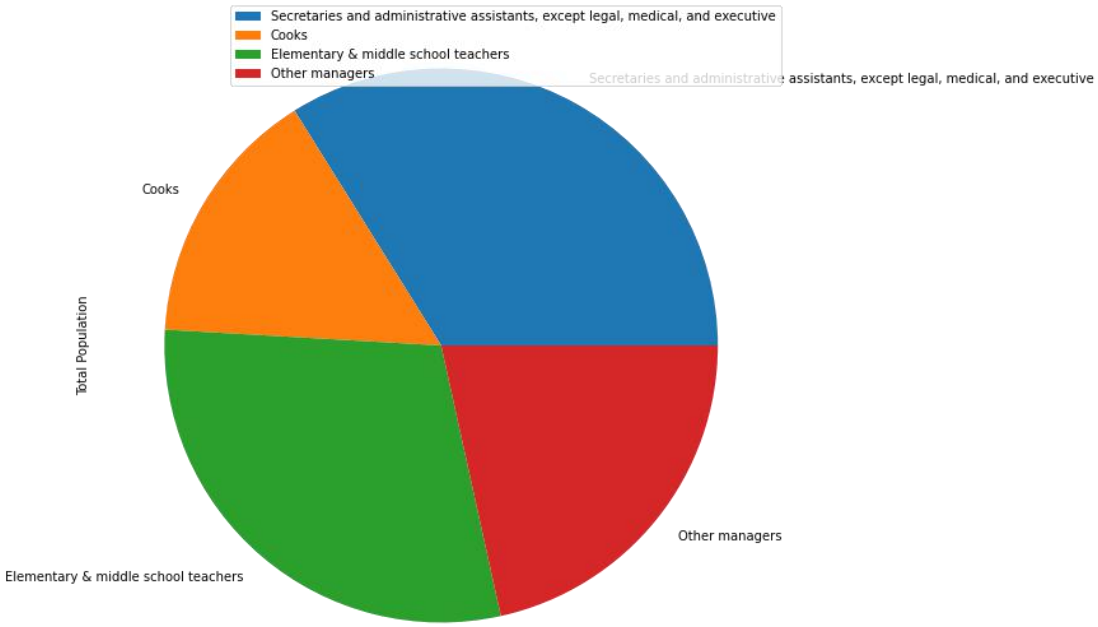
Employment distribution is different for the two cities. The gender gap is larger for miscellaneous managers, first line supervisors of retail workers and secretaries and administrative assistants in Missoula

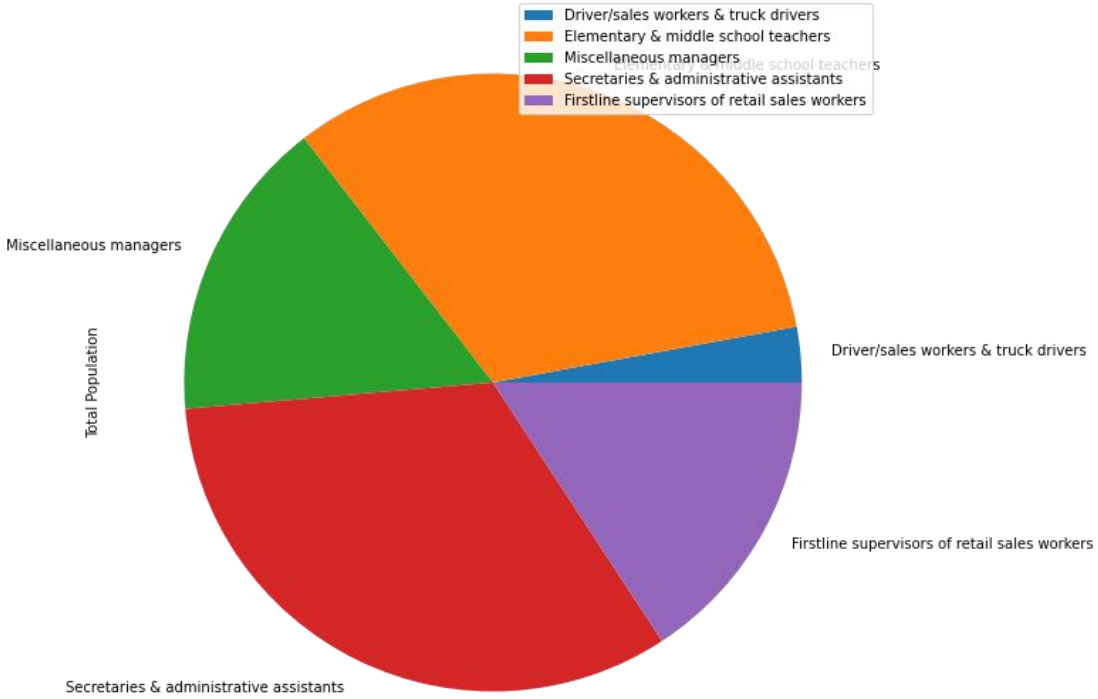
Male employment





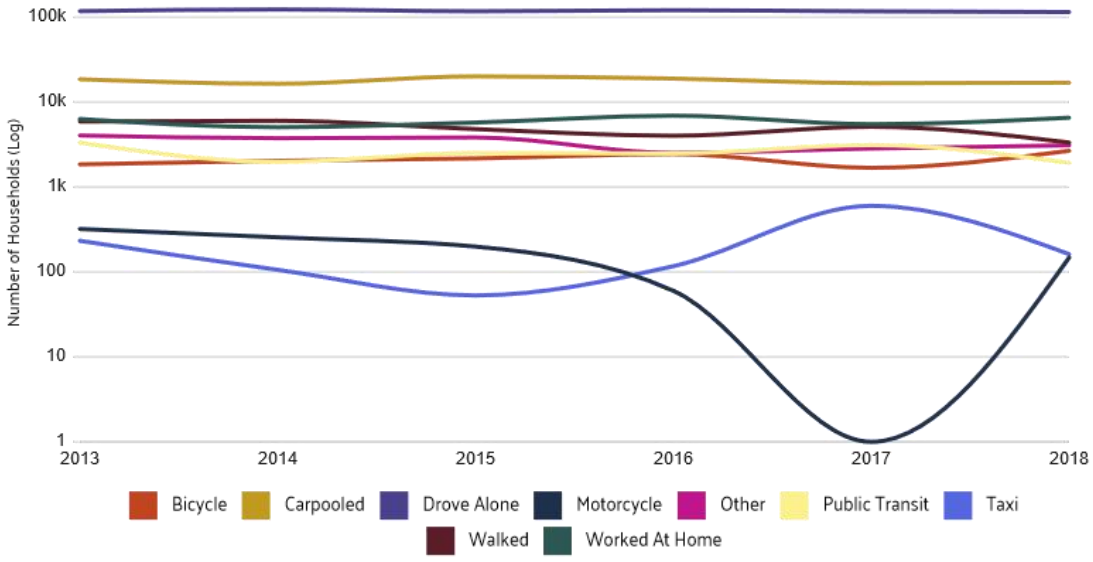
Female employment

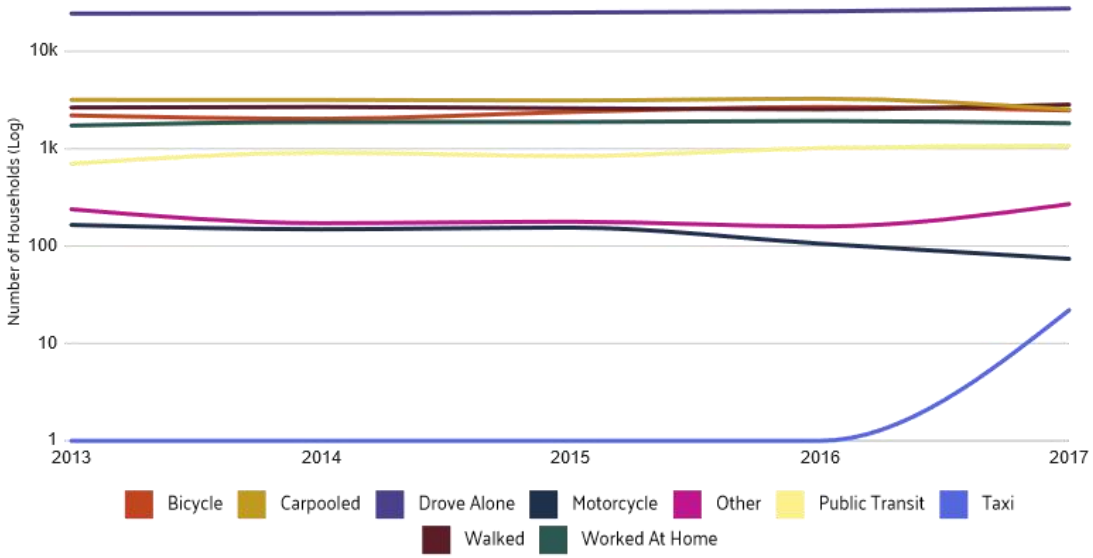




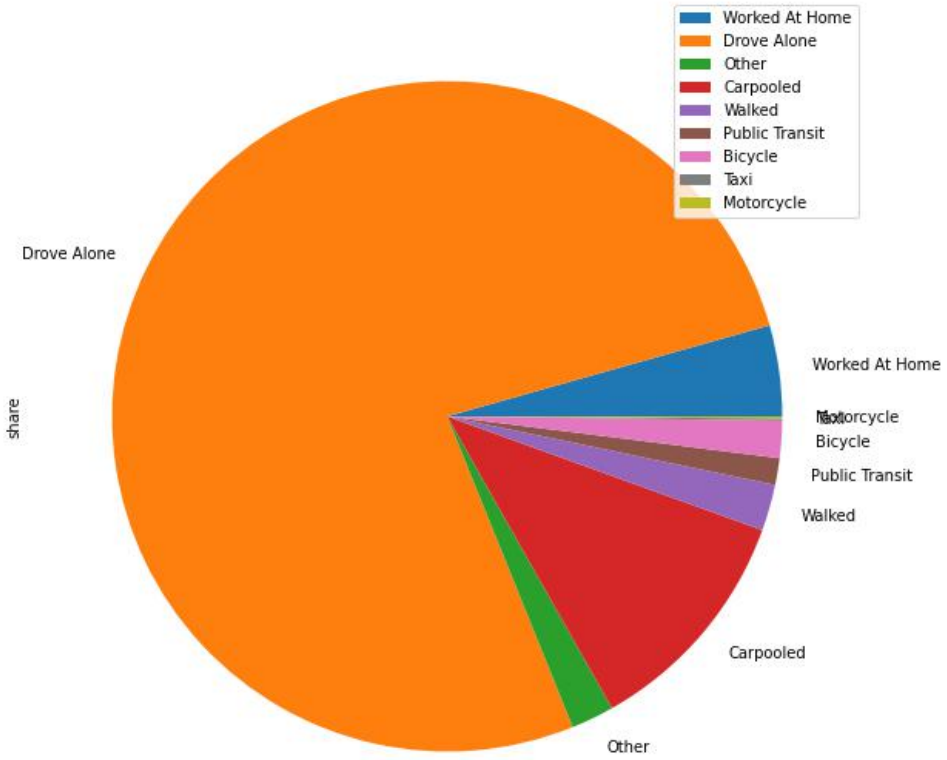
5) Transportation(Anchorage vs Missoula)

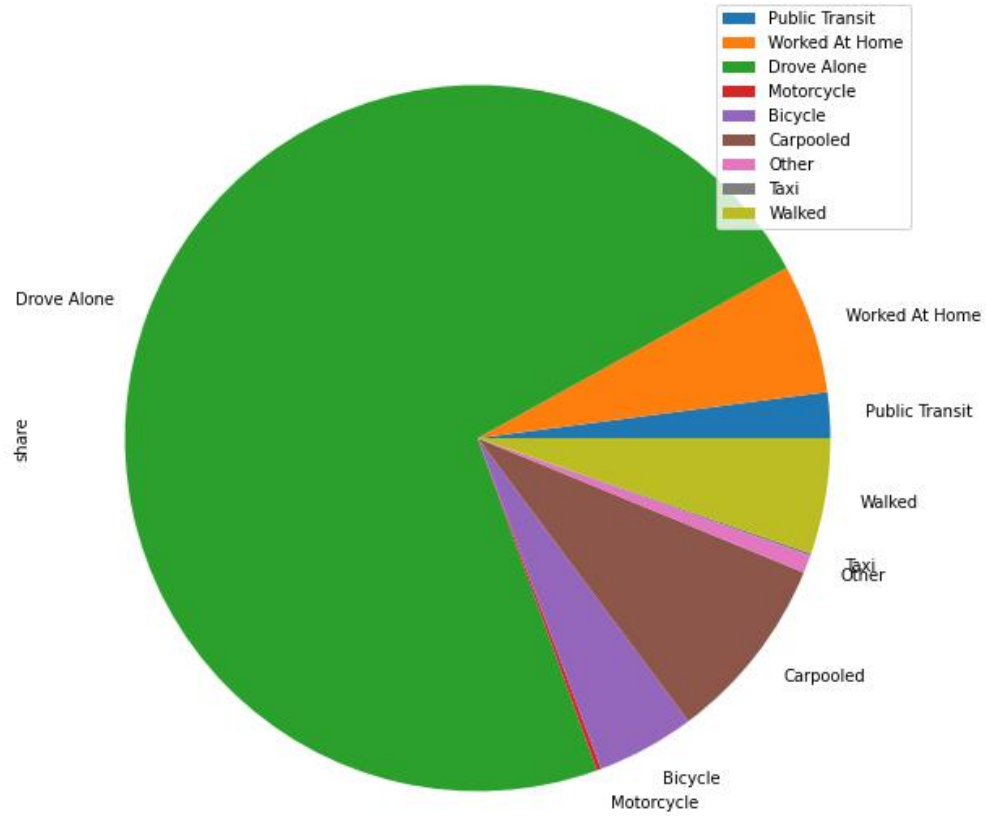
Data is quite similar for both the cities, only difference is that in Anchorage taxi was used and use of motorcycle decreased in 2017 while in Missoula, taxi was probably being used for transportation and the use of motorcycle remained consistent.





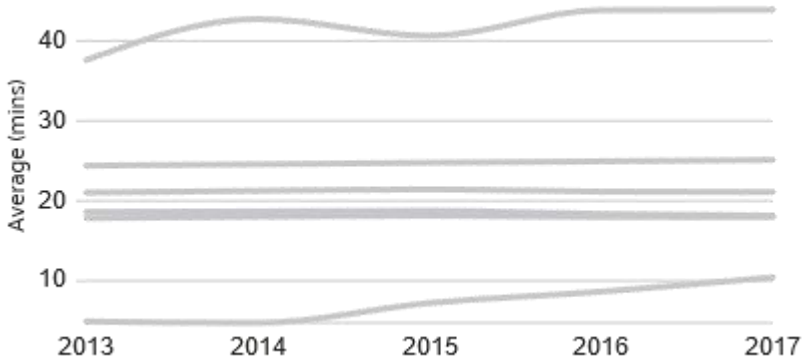
A clearer comparison can be seen viewing the pie charts provided

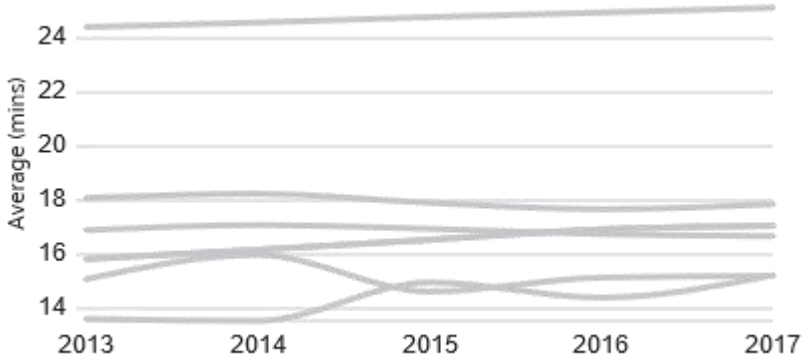

Worked At Home
Drove Alone
Other
Carpooled
Walked
Public Transit
Bicycle
Taxi
Motorcycle
Drove Alone
share
Worked At Home
Bicycle
Public Transit
Walked
Carpooled
Other


Public Transit
Worked At Home
Drove Alone
Motorcycle
Bicycle
Carpooled
Other
Taxi
Walked
Drove Alone
share
Worked At Home
Public Transit
Walked
Taxi
Other
Carpooled
Bicycle
Motorcycle

Commute time(Anchorage vs Missoula)

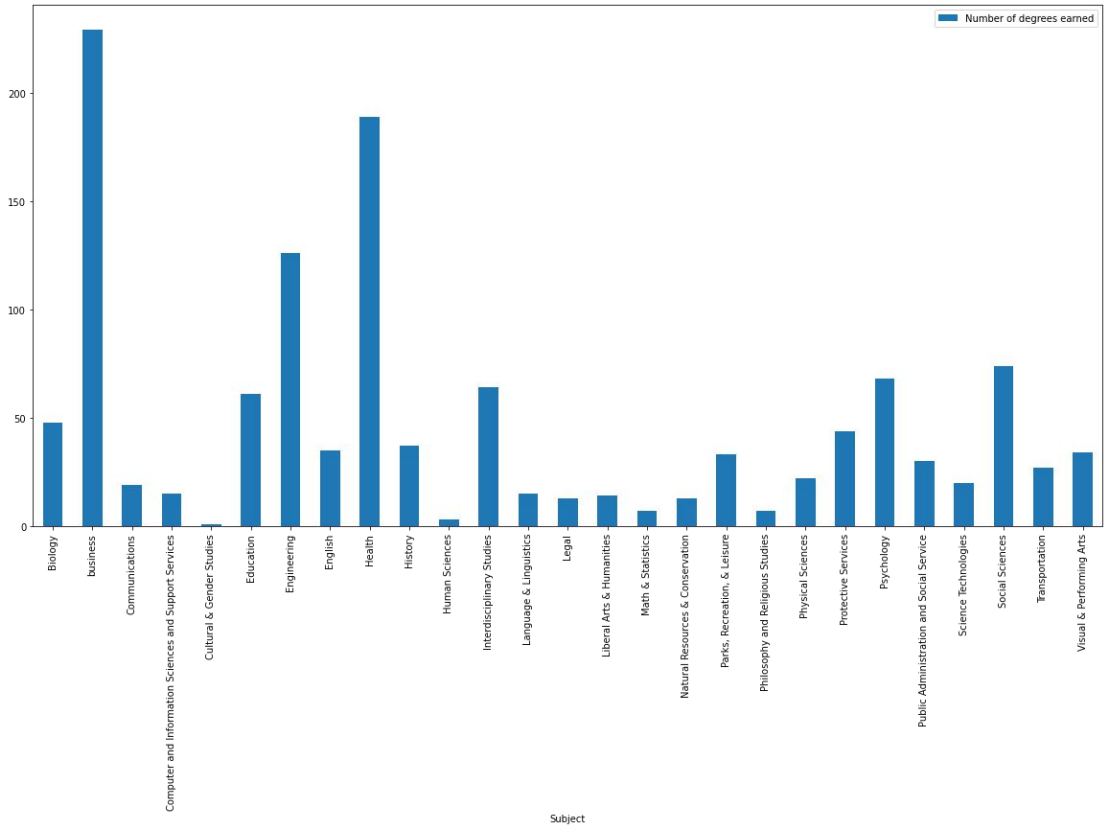
Commute time for Anchorage is generally higher compared to Missoula.

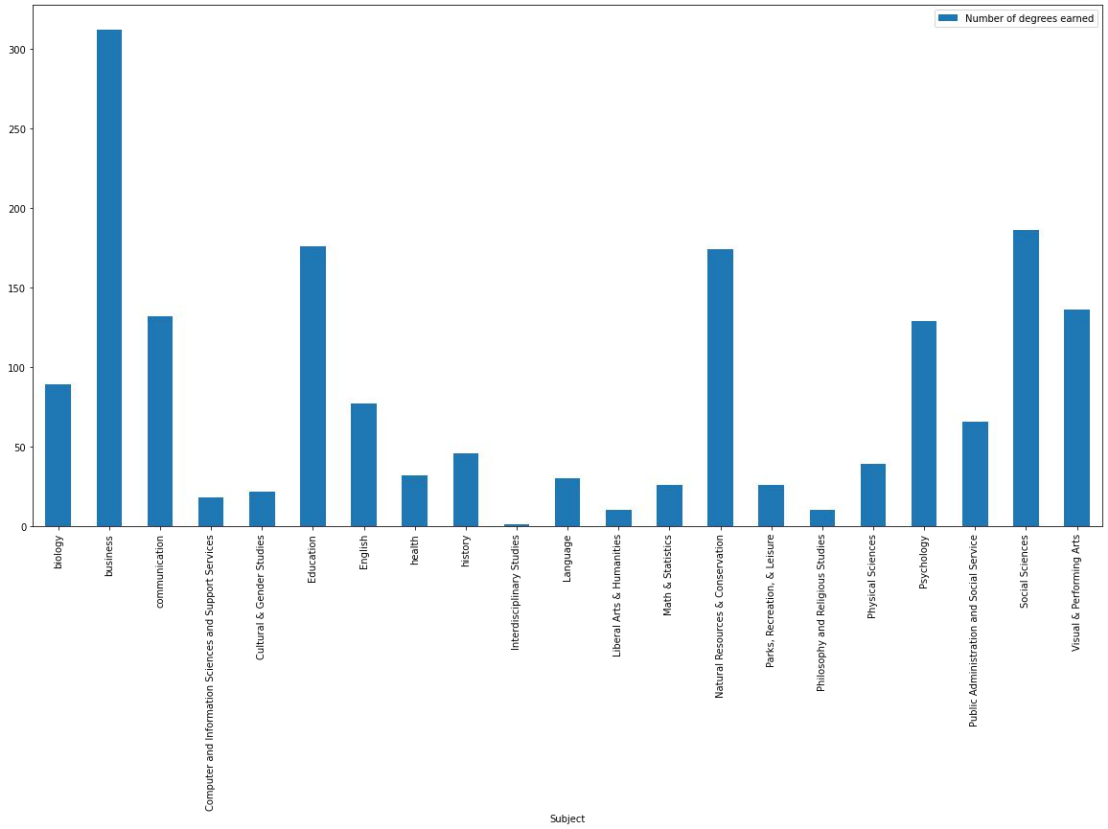




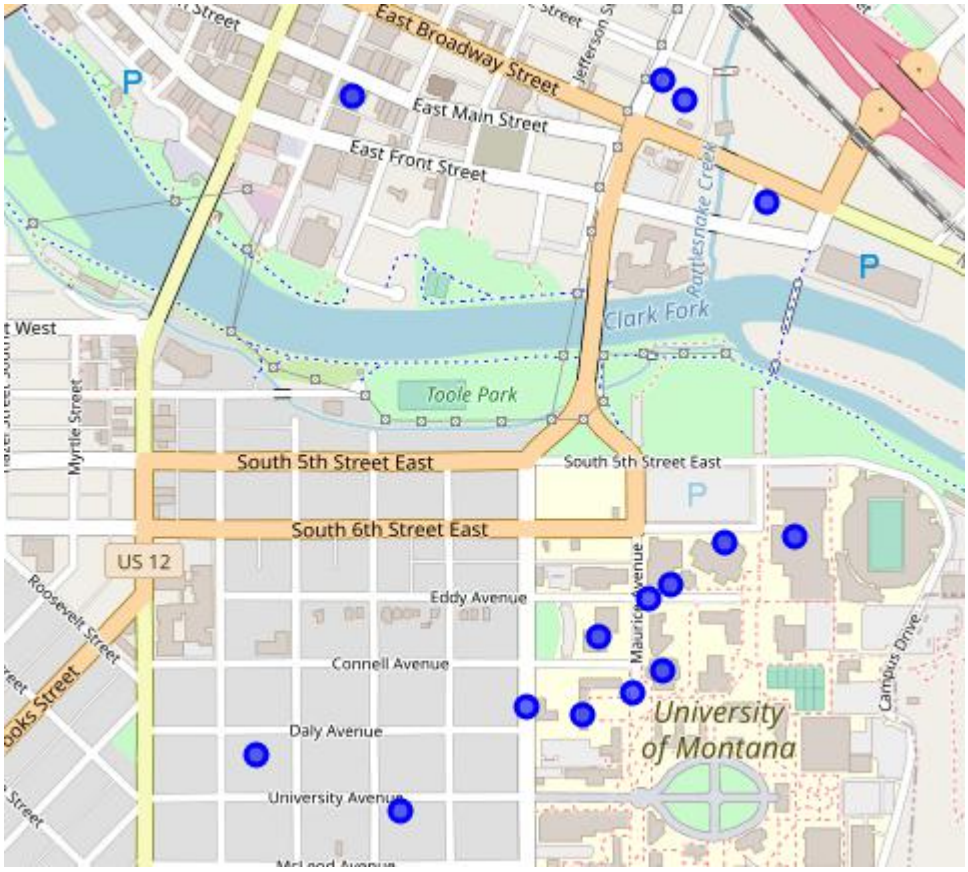
6) Education(Anchorage vs Missoula)

Health and commerce are 2 focus areas for study in Anchorage while commerce and social sciences are the focus areas of study in Missoula



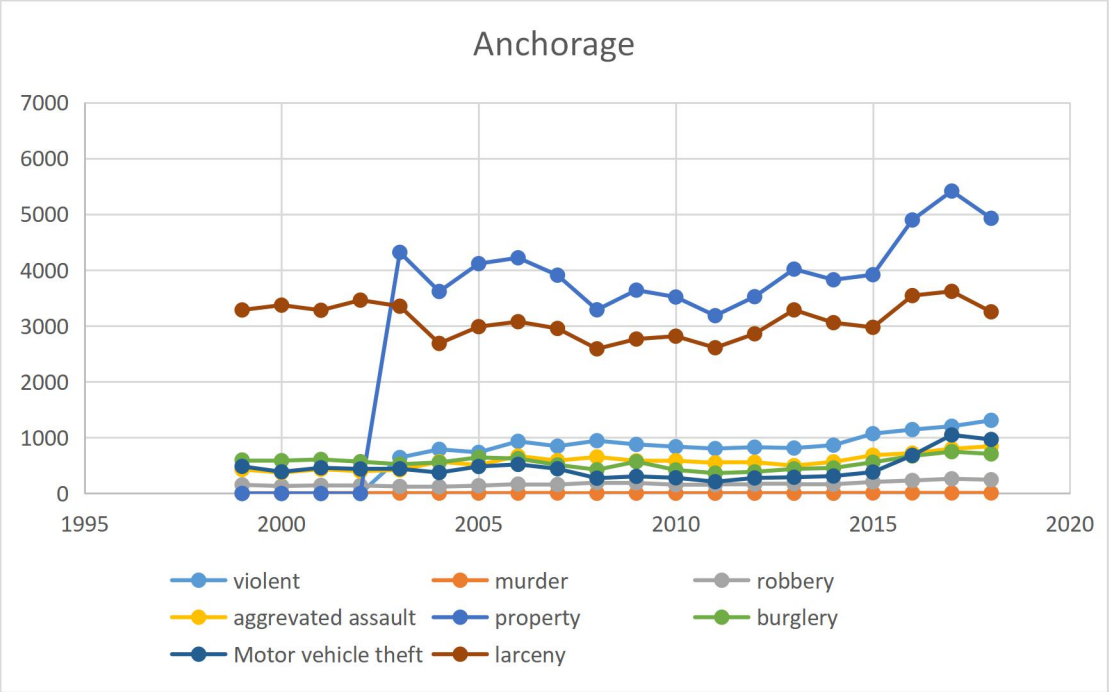


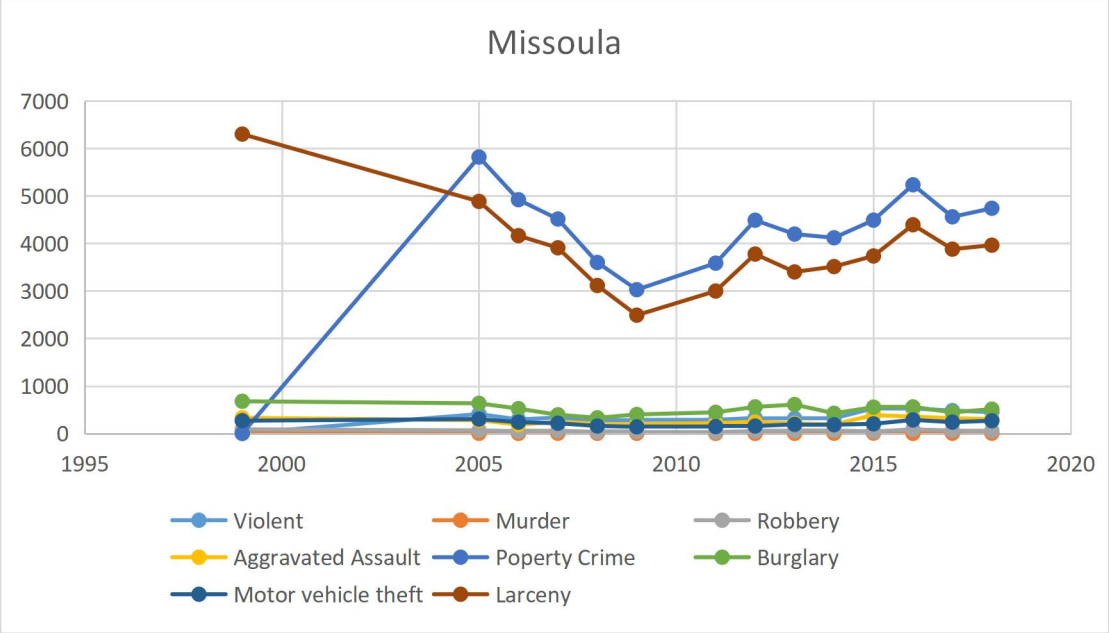
For further examination of the results foursquare was used for finding colleges or universities available in the 2 cities. Missoula seems to have more colleges.



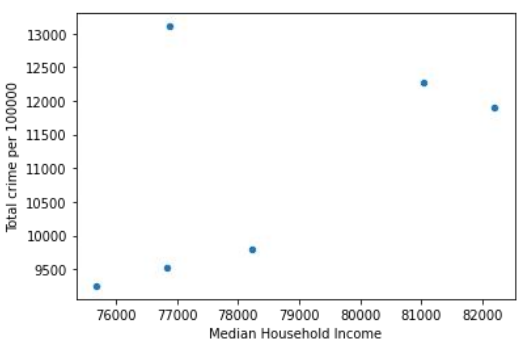
7) Crime(Anchorage vs Missoula)

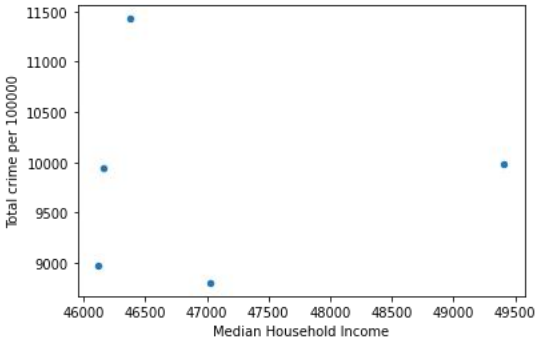
The crime records show that in Anchorage violent crimes reached to top during 2003 and remained at top followed by larceny while in Missoula, violent crimes reached to top during 2005 and remained at top followed by larceny

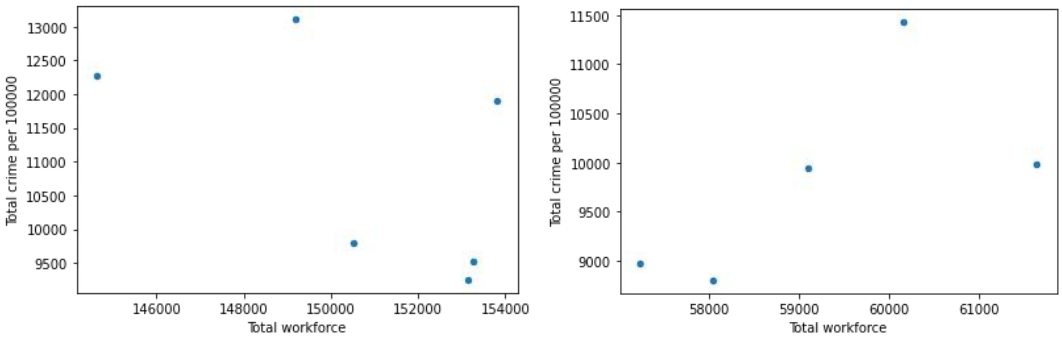




Plots showing correlation of employment, income with crime is displayed

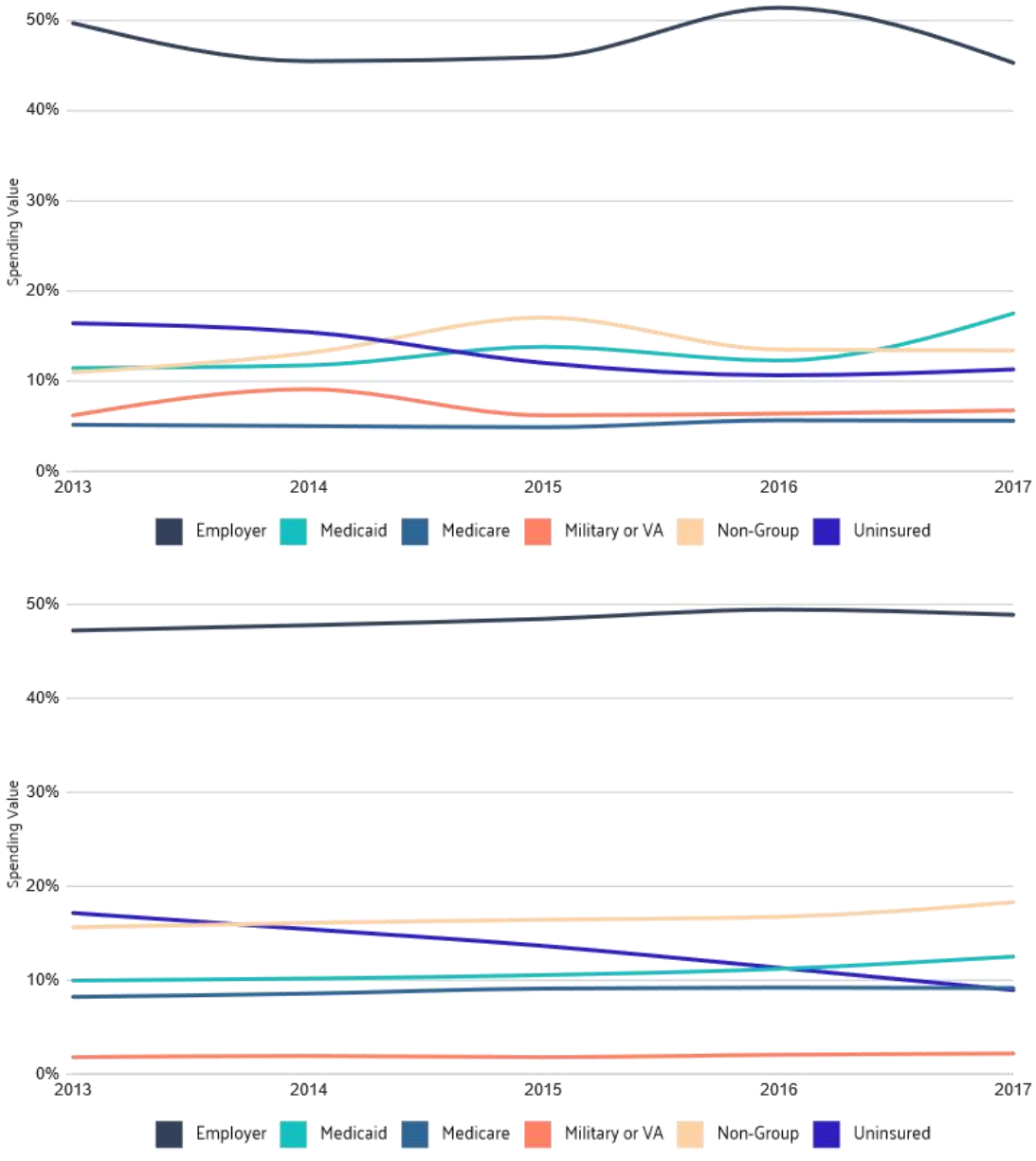


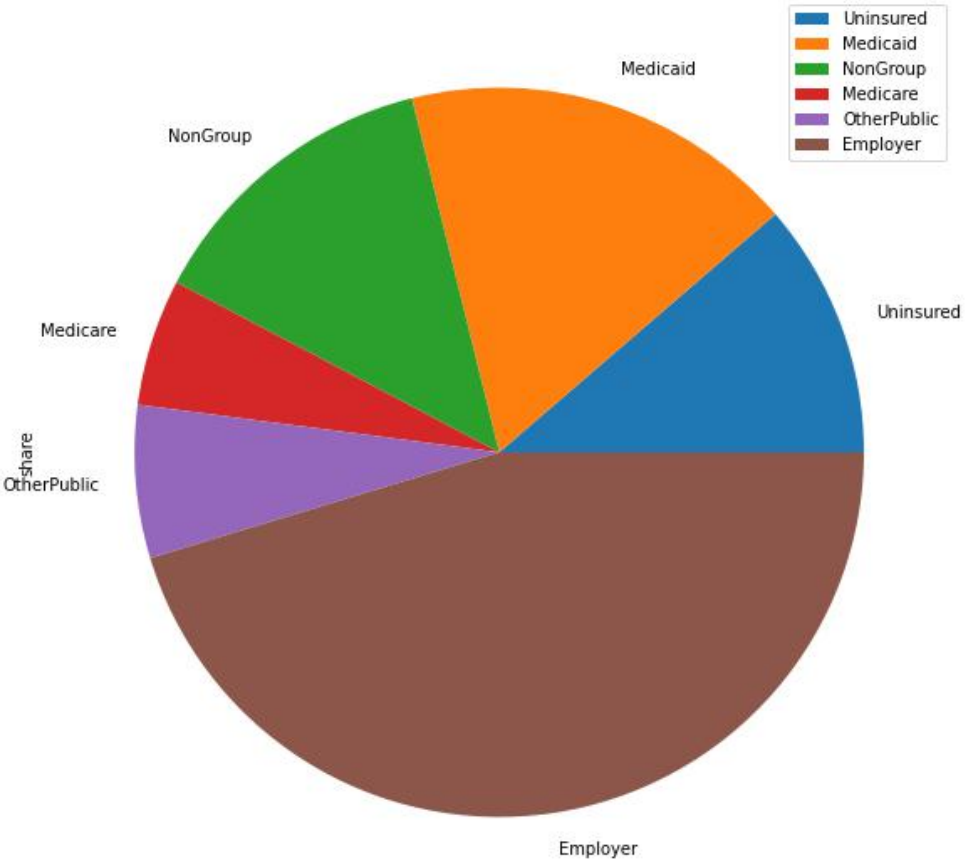


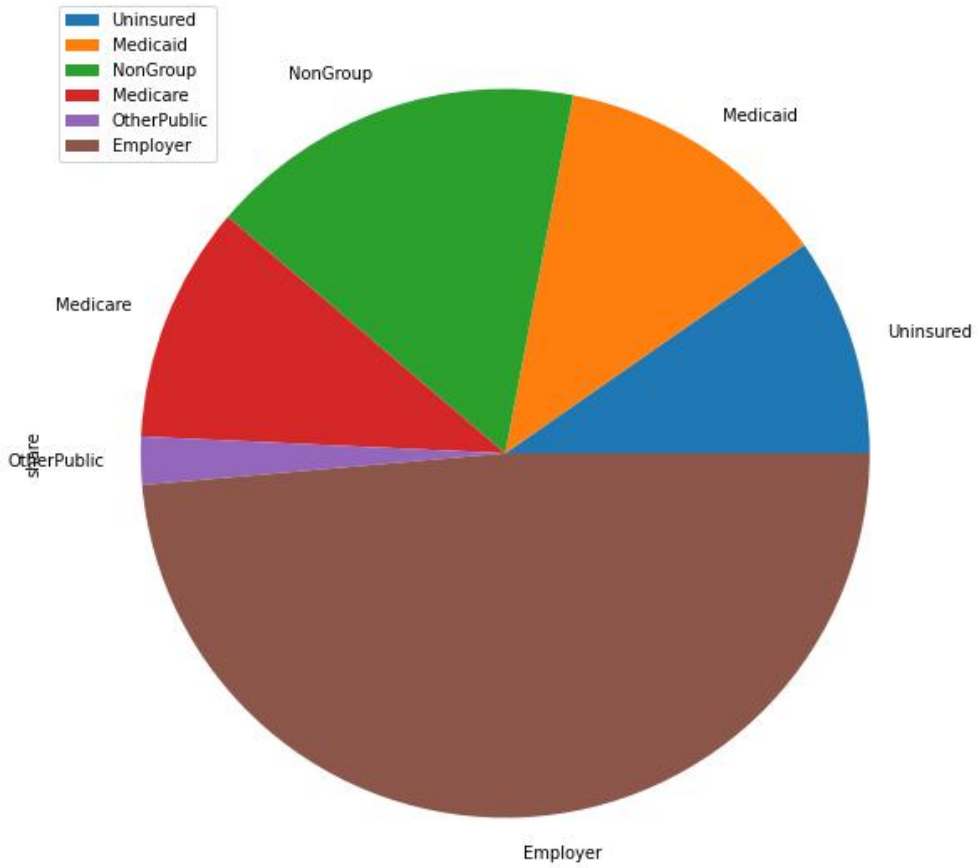


8) Health(Anchorage vs Missoula)

Health service is quite similar for the 2 cities

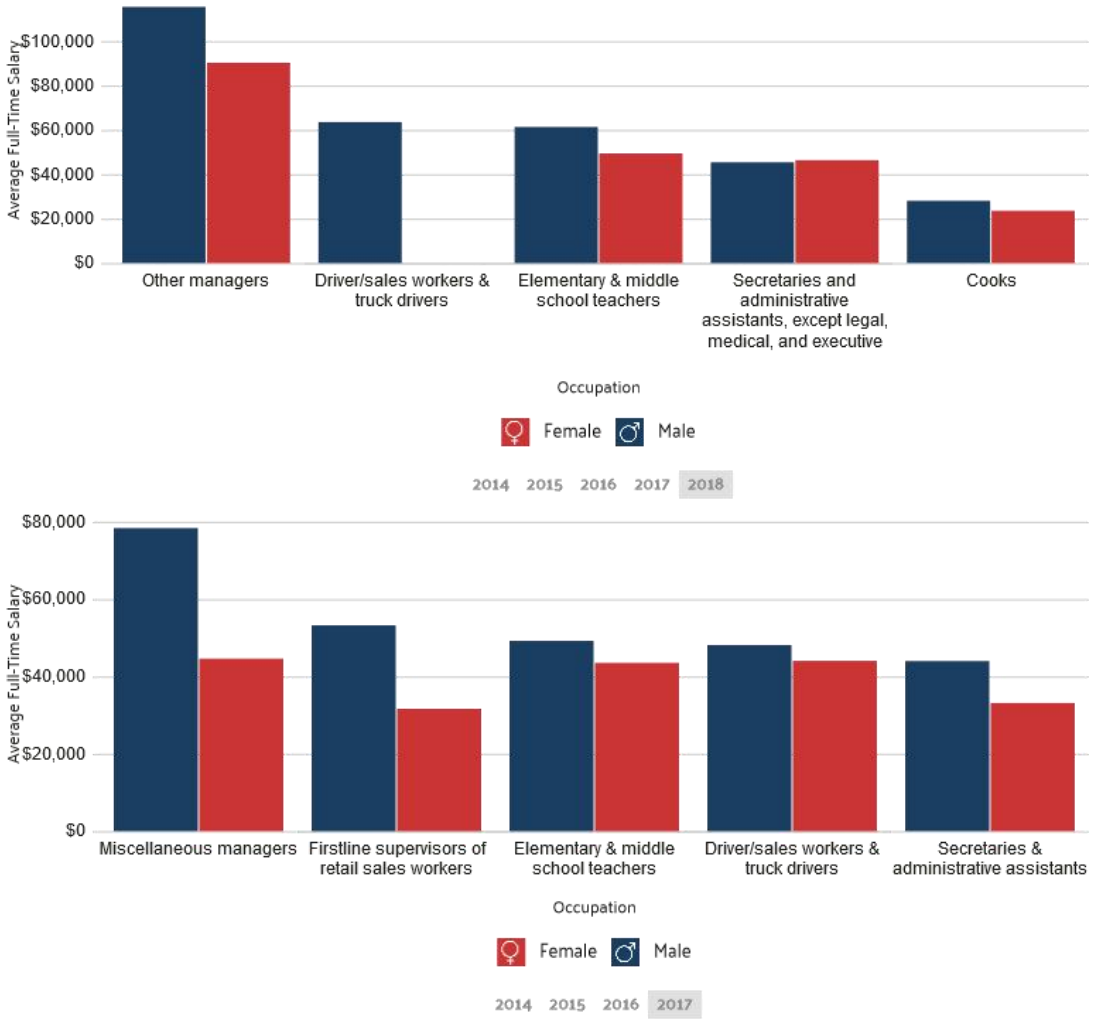



Uninsured
Medicaid
NonGroup
Medicare
OtherPublic
Employer
Medicaid
NonGroup
Uninsured
Medicare
share
OtherPublic
Employer

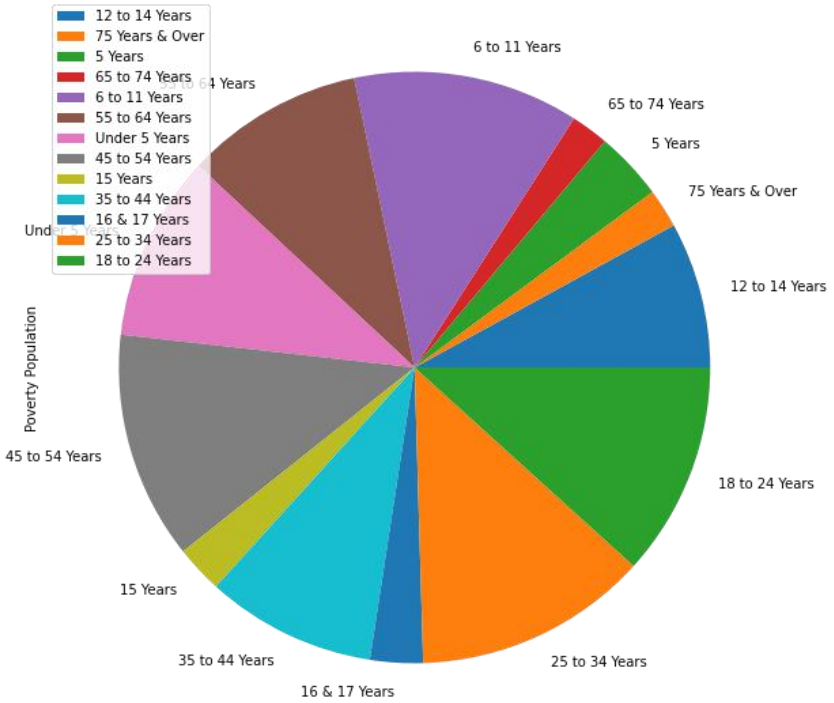

Uninsured
Medicaid
NonGroup
Medicare
OtherPublic
Employer
NonGroup
Medicaid
Medicare
Uninsured
share
OtherPublic
Employer

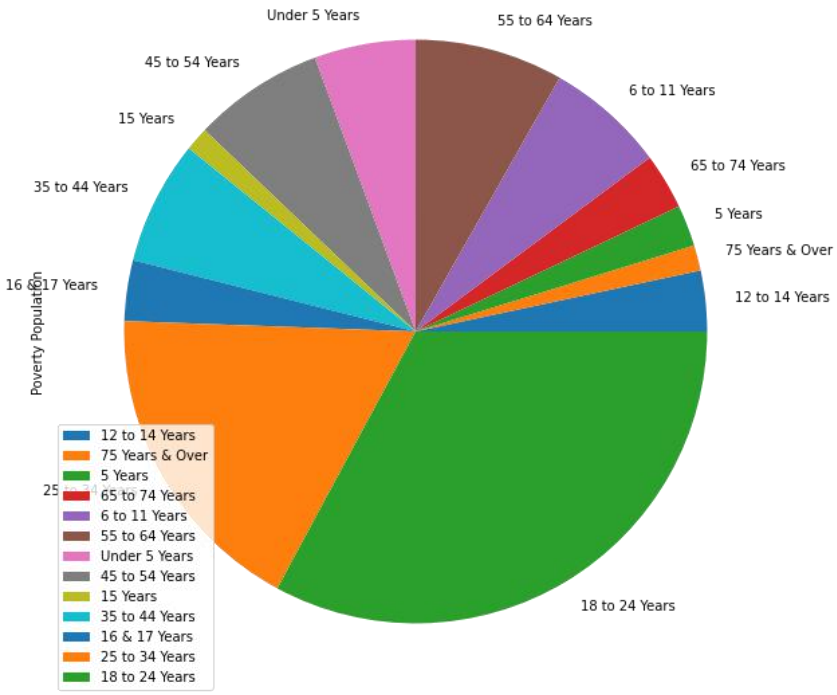
9) Poverty(Anchorage vs Missoula)

Poverty rate for both cities quite similar except for age range 18-24, poverty rate is higher in Missoula compared to Anchorage

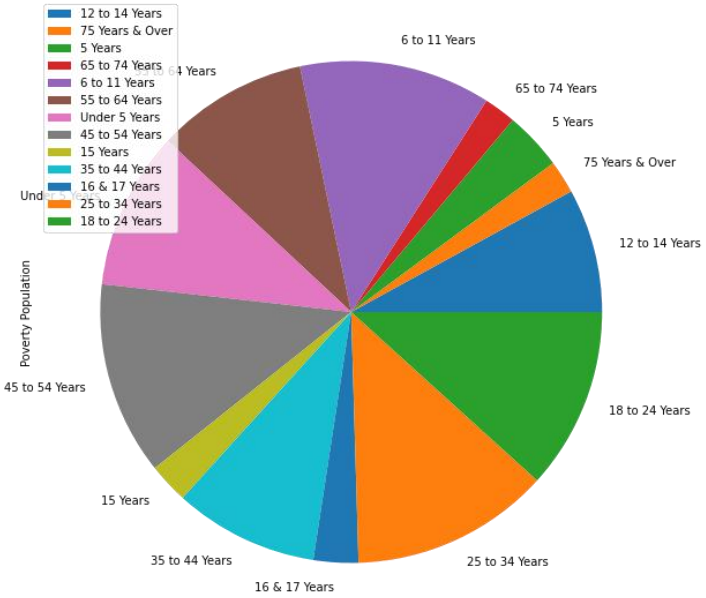


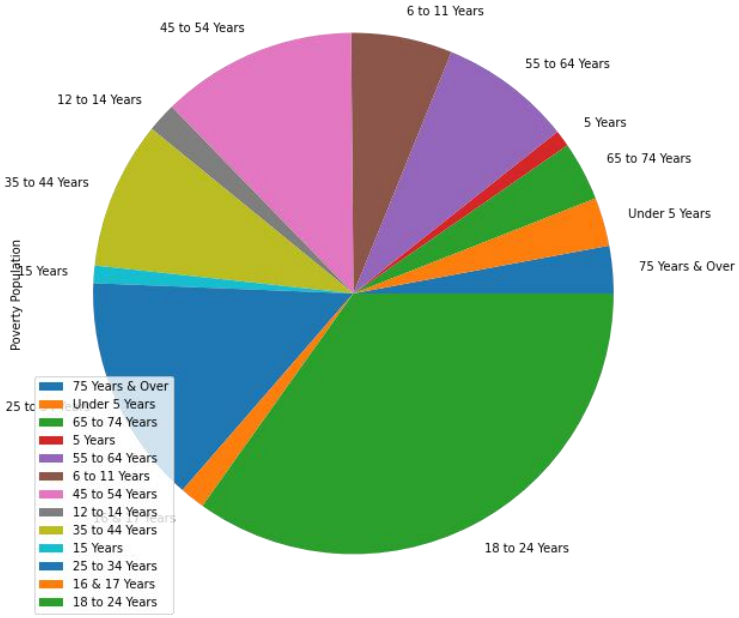
Male poverty





Female poverty





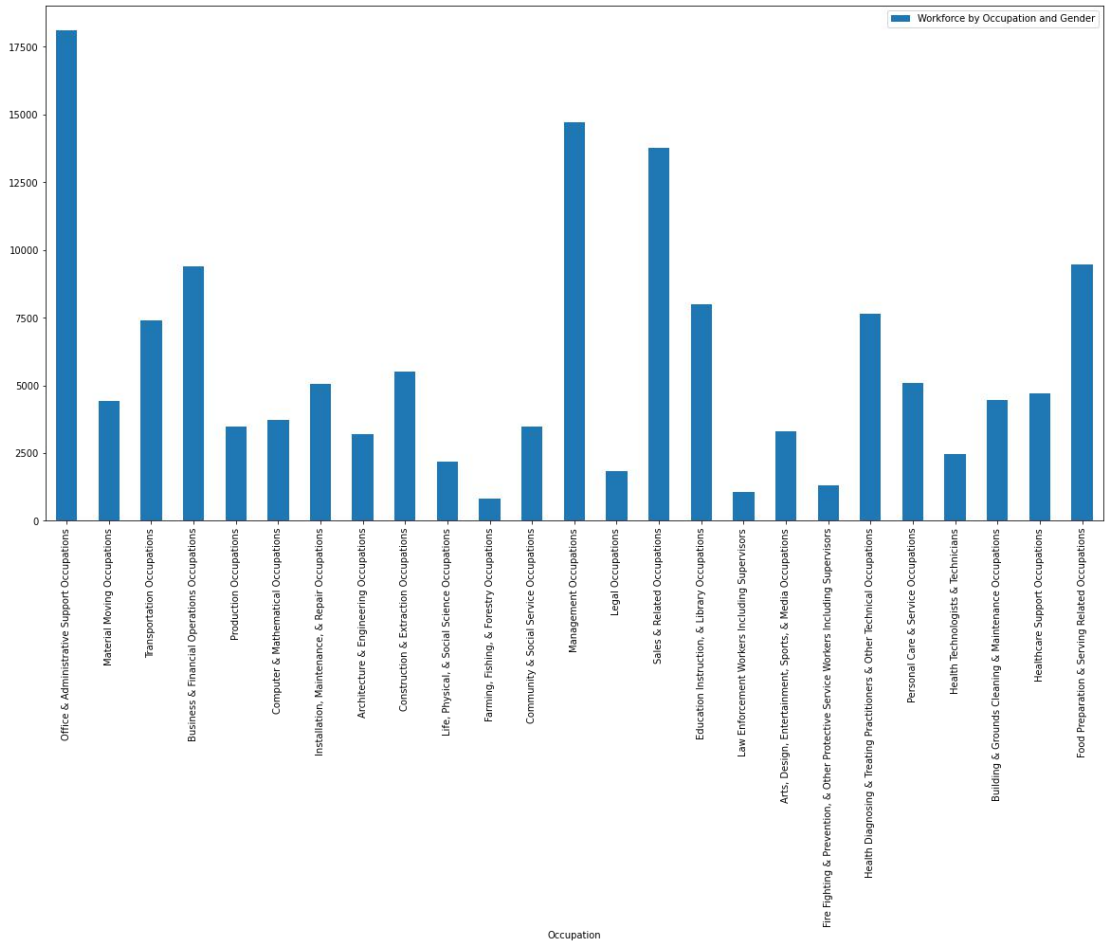
<u>For the second question:</u>

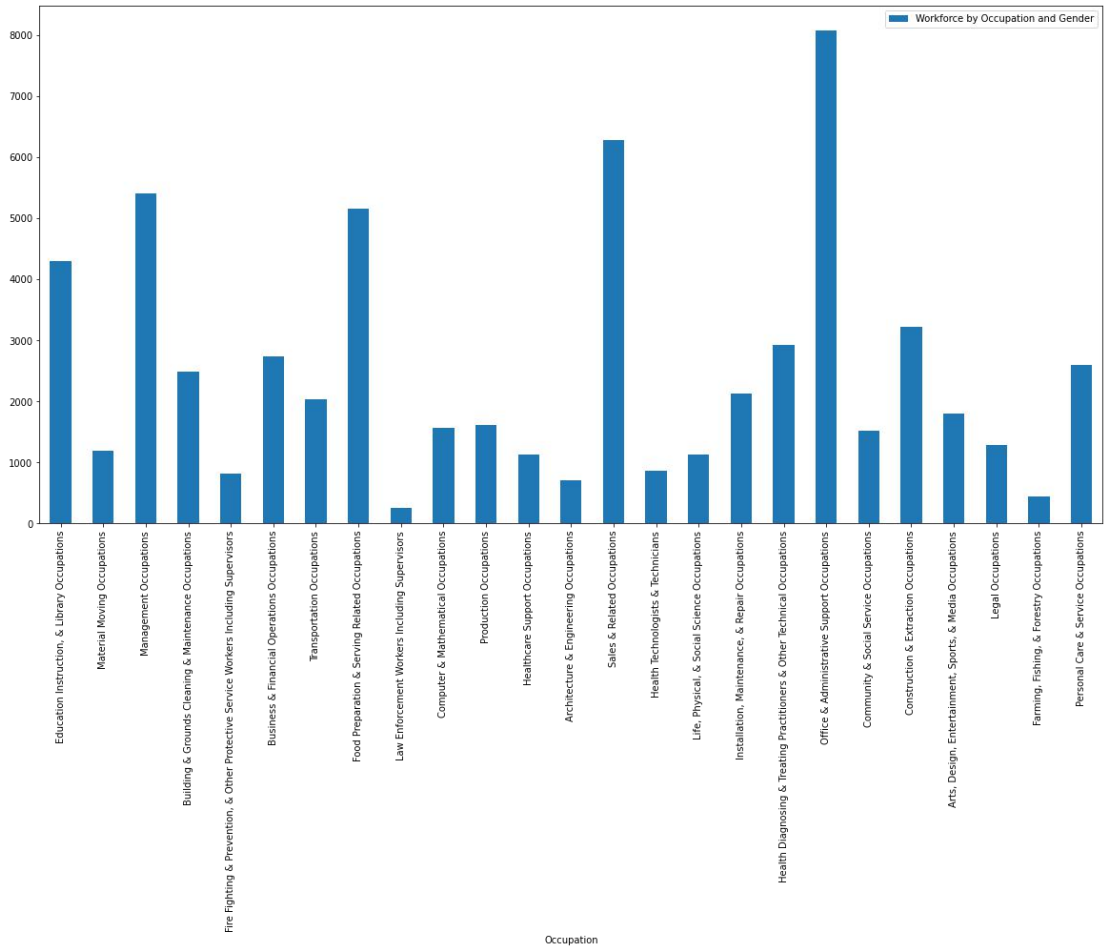
Which city would be better for setting up a business?

For this problem also, most of the features are needed for observation. Only the new feature which needs to be included now is economy of the city which includes:

1) employment by occupation(Anchorage vs Missoula)

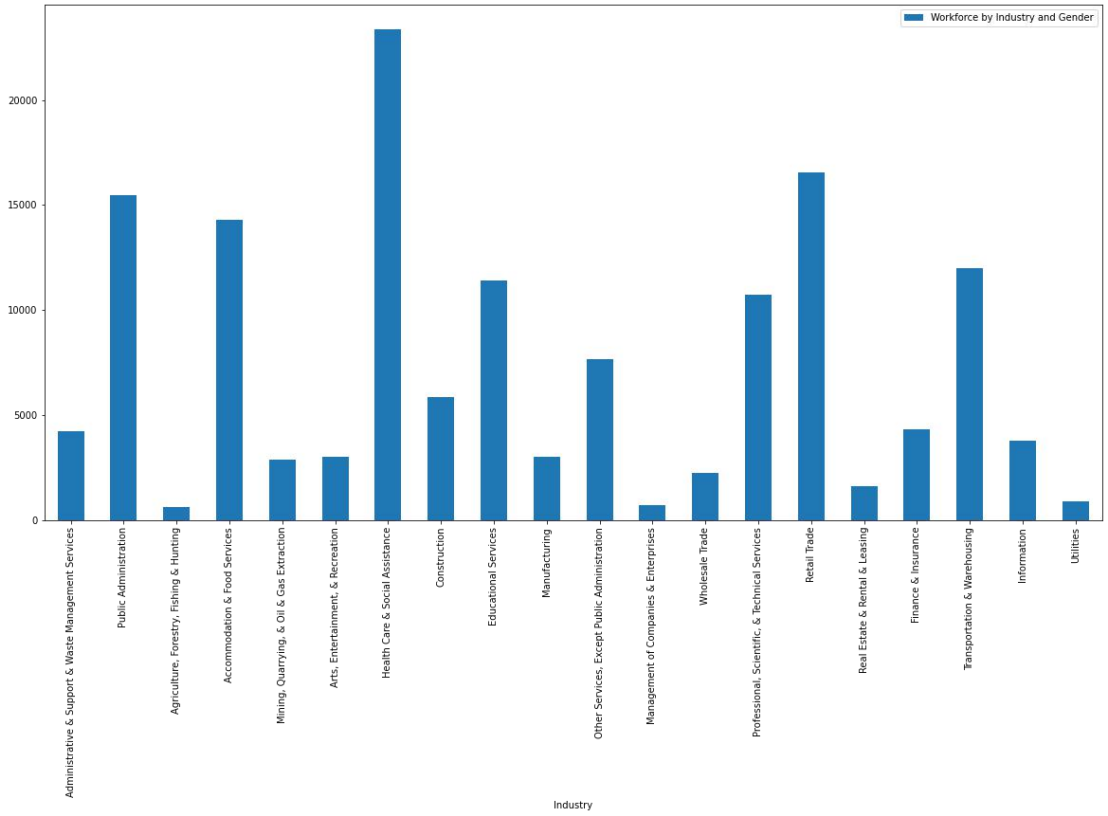
The management sector seems quite demanding for both the cities. Specifically, office and administrative support are the most common occupations

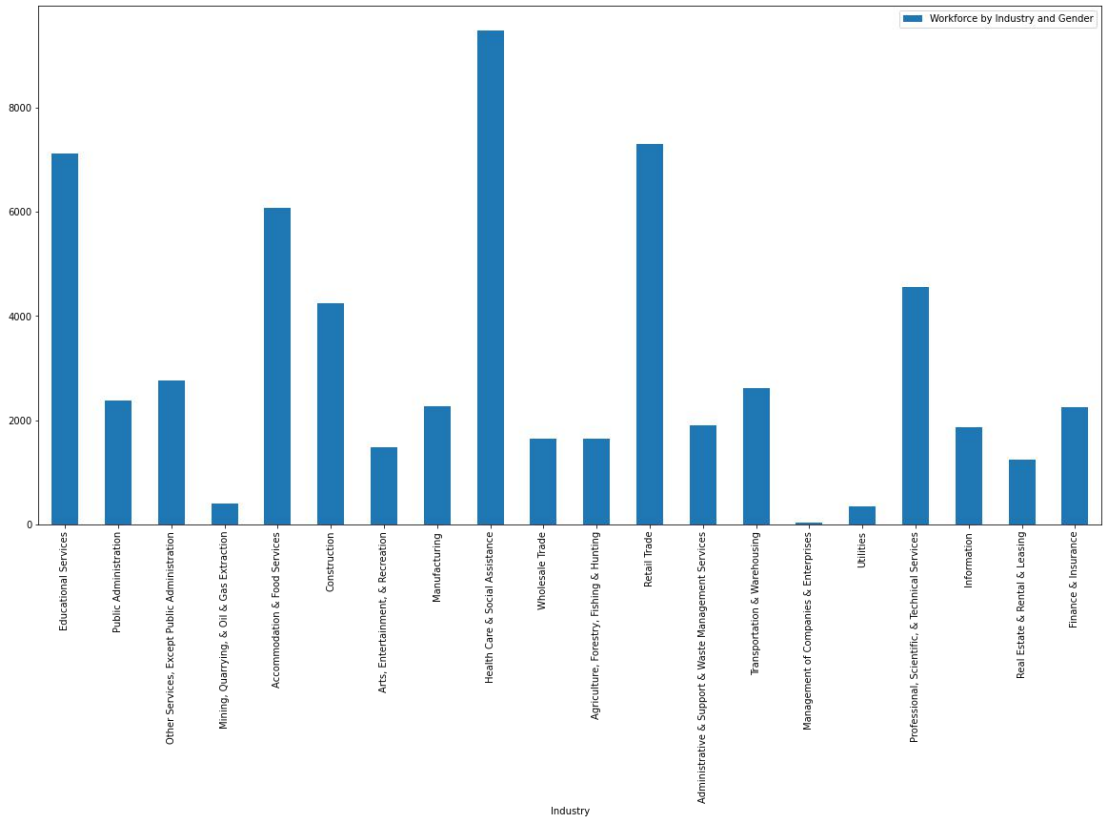

Workforce by Occupation and Gender
17500
15000
12500
10000
7500
5000
2500
0
Office & Administrative Support Occupations
Material Moving Occupations
Transportation Occupations
Business & Financial Operations Occupations
Production Occupations
Computer & Mathematical Occupations
Installation, Maintenance, & Repair Occupations
Architecture & Engineering Occupations
Construction & Extraction Occupations
Life, Physical, & Social Science Occupations
Farming, Fishing, & Forestry Occupations
Community & Social Service Occupations
Management Occupations
Legal Occupations
Sales & Related Occupations
Education Instruction, & Library Occupations
Law Enforcement Workers Including Supervisors
Arts, Design, Entertainment, Sports, & Media Occupations
Fire Fighting & Prevention, & Other Protective Service Workers Including Supervisors
Health Diagnosing & Treating Practitioners & Other Technical Occupations
Personal Care & Service Occupations
Health Technologists & Technicians
Building & Grounds Cleaning & Maintenance Occupations
Healthcare Support Occupations
Food Preparation & Serving Related Occupations
Occupation



Using foursquare api, few buildings were located relevant to ‘management’, the counts are more for missoula.

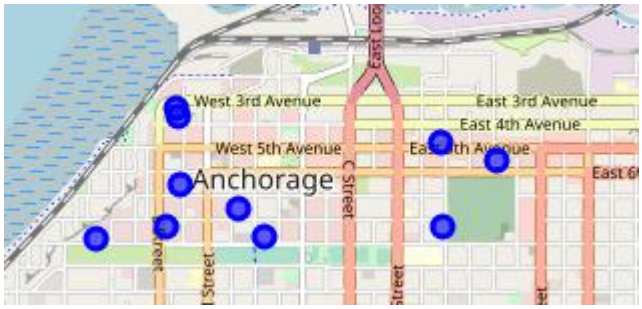
2) industry distribution(Anchorage vs Missoula)

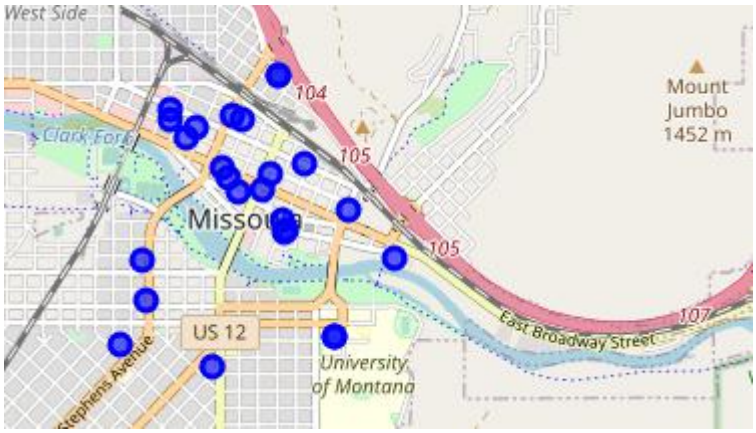


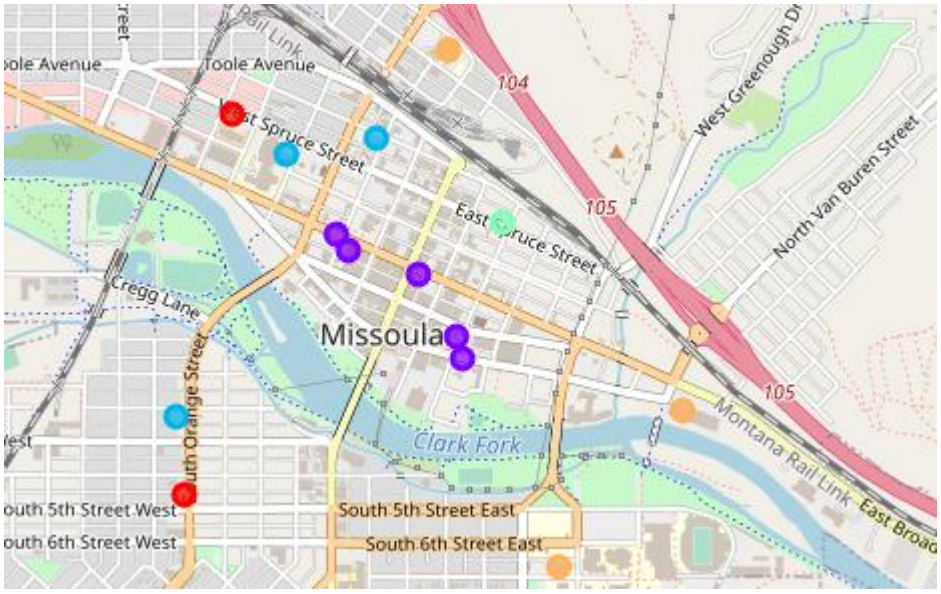


Using foursquare api, the few buildings relevant to health care service were obtained, the results seem to be consistent with the map data.

k-means clustering was used for finding locations which may be popular for the relevant industry.







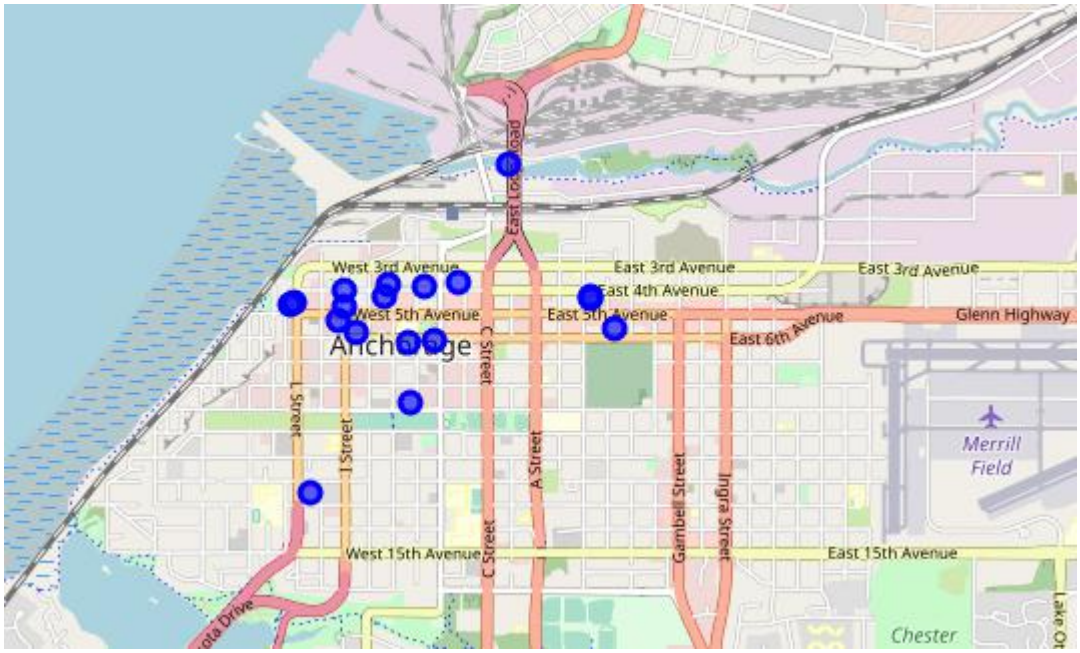
3) wage distribution(Anchorage vs Missoula)

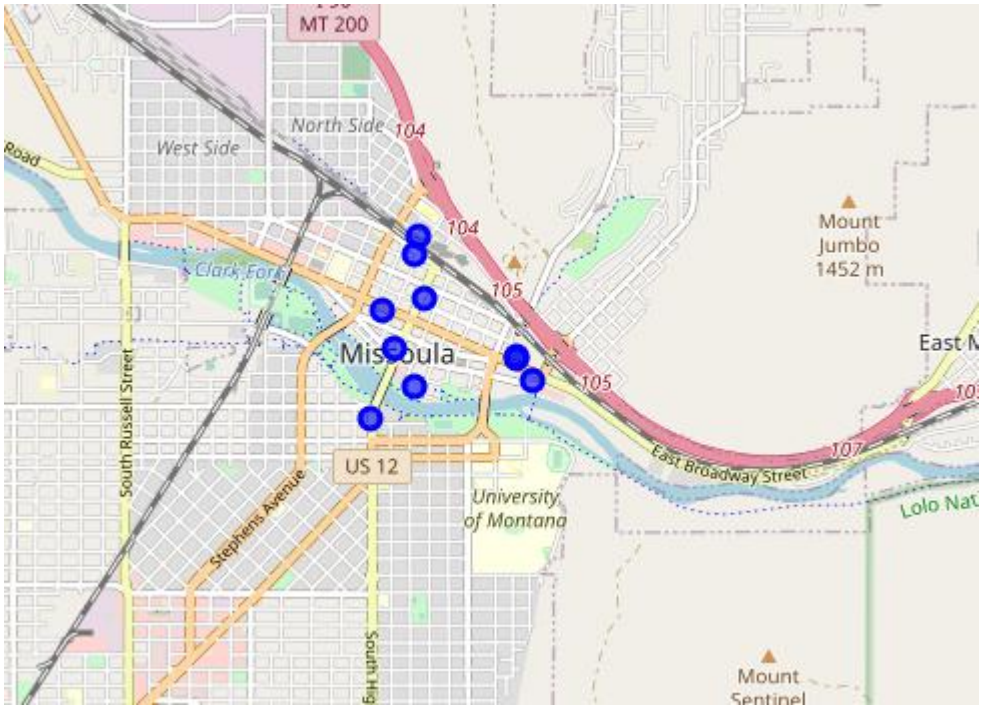
Wage share seem to be lower for low income ranges in Anchorage but higher for high income ranges compared to missoula.

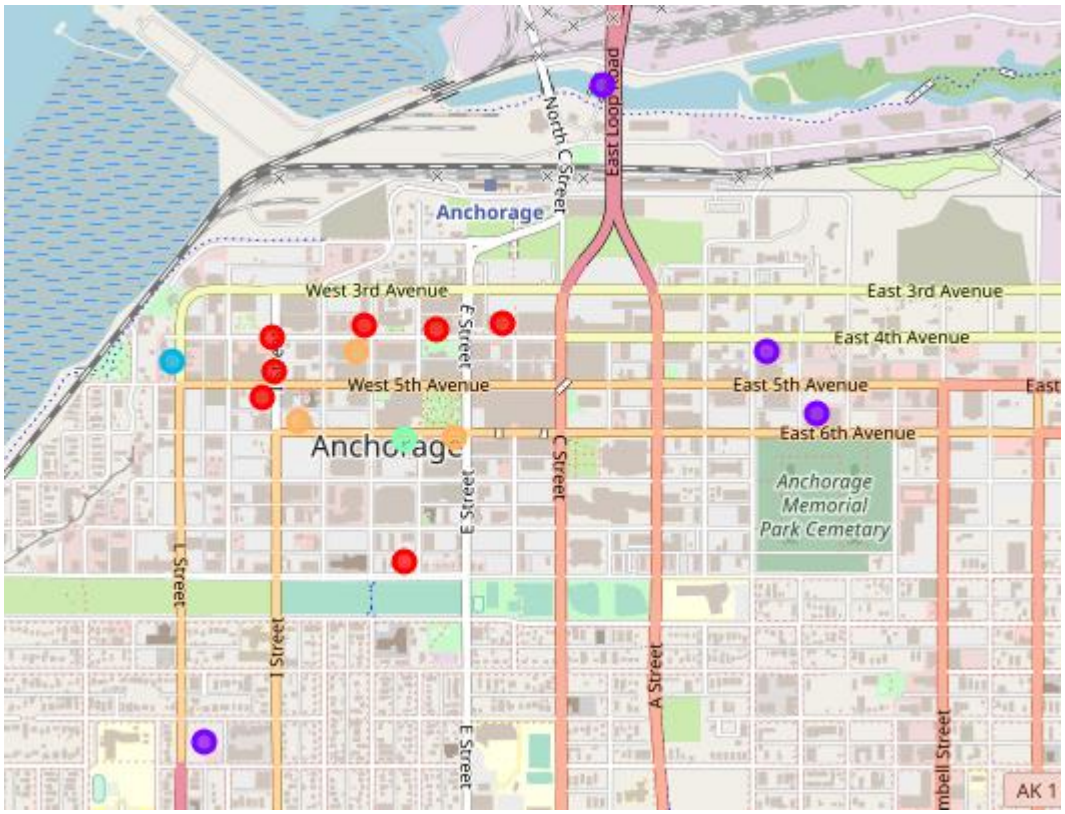
Additional information:

Additionally for people interested to open up a restaurant can view the provided data to have an idea on the different types of restaurants available in 2 different cities. Foursquare api was used to display the data.

The 2 images show few restaurant distributions across anchorage and missoula. Anchorage has more restaurants compared to missoula. Clustering was done using k-means to find the locations which may be the hotspot for restaurants.




MT 200
North Side
West Side
104
105
107
Mount
Jumbo
1452 m
Clark Fork
Missoula
South Russell Street
US 12
Stephens Avenue
University
of Montana
East Broadway Street
Mount


North C Street
East Loop Road
Anchorage
West 3rd Avenue
East 3rd Avenue
East 4th Avenue
West 5th Avenue
East 5th Avenue
East 6th Avenue
E Street
C Street
Anchorage
Memorial
Park Cemetary
L Street
I Street
A Street
AK 1

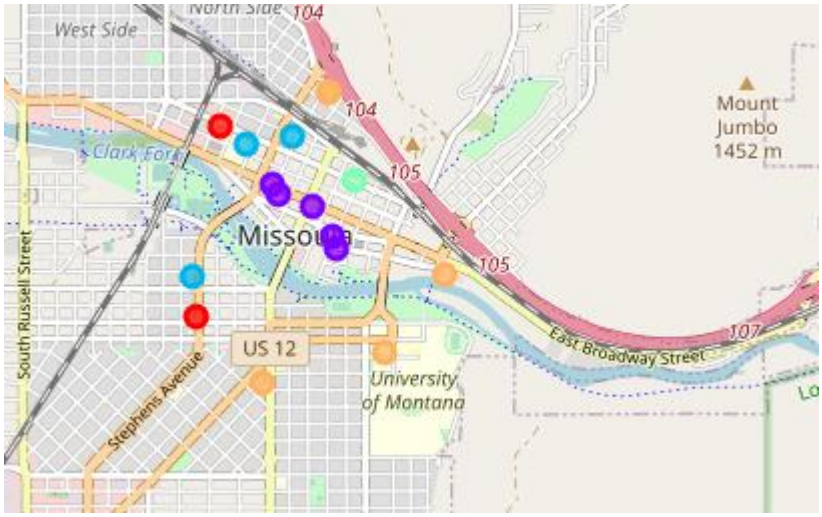
	address
3	343 W 6th Ave
5	401 I St
6	411 W 4th Ave
9	533 W 4th Ave
11	611 W 9th Ave
14	930 W 5th Ave
15	939 W 5th Ave

	address
0	1200 L St
1	221 Ship Creek Ave
2	312 E 4th Ave
4	401 E 6th Ave

	address
8	508 W 6th Ave
12	712 W 4th Ave
13	825 W 6th Ave

	address
7	420 L St

	address
10	610 W 6th Ave



	address
10	509 S 5th St W
12	601 W Spruce St Ste K

	address
2	101 East Broadway Street
3	219 E Main St
4	225 W Broadway St
6	300 W Broadway St Ste 2
8	323 East Front Street

	address
7	301 W Alder St
9	500 W. Broadway St
11	521 S 2nd St W

	address
5	228 E Spruce St

	address
0	1001 E Broadway St
1	1001 S Higgins Ave Ste B2
13	634 Eddy Ave
14	900 N Orange St Ste 102
15	902 N Orange St

The data may be useful for both who are willing to open up business or planning for residence. Person willing to reside may find one city useful for availablity of restaurants, better lunch,dinner while person willing to open up business may or may not open the restaurant to the given city considering the customer demand and competition.

Conclusion:

Both the cities may be good option for residence or setting up business. Considering employment, poverty, wage distribution, Anchorage may be a good option while considering education, property tax, gender gap in employment, property value, Missoula would be a good option.

For people planning to study commerce or planning to open a commerce institution, Missoula would be a good option while for people interested in jobs relevant to health sectors or willing to open health institution, Anchorage would be better.

For business owners interested to open restaurants in a less busy area, Missoula would be a good choice while owners planning to open business to join the competition, Anchorage would be better.

To conclude, choice depends on consideration of factors.

Reference:

Few resources have been used from:

1) https://datausa.io/profile/geo/missoula-mt
2) https://www.wikipedia.org/
3) https://datausa.io/profile/geo/anchorage-ak
4) https://microtrends/