

# CS506 Deliverable 2

## Group Members

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## Secondary Batch of Data:

Dataset Name	Source
<p>2019 Census Data on Age groups of total population in MA, and population of different ethnic groups and their subgroups.</p> <p>2019 Census Data on Age groups of Asian Population alone in MA.</p> <p>2019 Census Data on Ethnic groups in MA, including multiple aspects: age groups, household type, school enrollment, employment status and so on. (limited on Asian Indian and Chinese only)</p>	<p><a href="https://data.census.gov/cedsci/table?q=Race&amp;t=-03%20-%20All%20available%20basic%20race%20combinations%3A-04%20-%20All%20available%20detailed%20Asian%20races%3AALanguage%20Spoken%20at%20Home%3ARace%20and%20Ethnicity&amp;g=0400000US25&amp;y=2019&amp;tid=ACSSP1Y2019.S0201&amp;hidePreview=true">https://data.census.gov/cedsci/table?q=Race&amp;t=-03%20-%20All%20available%20basic%20race%20combinations%3A-04%20-%20All%20available%20detailed%20Asian%20races%3AALanguage%20Spoken%20at%20Home%3ARace%20and%20Ethnicity&amp;g=0400000US25&amp;y=2019&amp;tid=ACSSP1Y2019.S0201&amp;hidePreview=true</a></p>
<p>2017 Census Data population in MA of different Asian ethnic groups.</p> <p>2019 Census Data population in MA of different Asian ethnic groups.</p> <p>2000 &amp; 2010 U.S. Census Data.</p>	<p><a href="https://www.populationu.com/us/massachusetts-population">https://www.populationu.com/us/massachusetts-population</a></p> <p><a href="https://www.pewresearch.org/fact-tank/2021/04/29/key-facts-about-asian-americans/">https://www.pewresearch.org/fact-tank/2021/04/29/key-facts-about-asian-americans/</a></p> <p><a href="https://scholarworks.umb.edu/iaas_publications/31/">https://scholarworks.umb.edu/iaas_publications/31/</a></p>
<p>2013 - 2019 Asian Population Change</p> <p>2013 - 2019 MA Income Change</p>	<p><a href="https://www.census.gov/data/developers/data-sets/acs-1year.html">https://www.census.gov/data/developers/data-sets/acs-1year.html</a></p> <p><a href="https://datausa.io/profile/geo/boston-ma/#economy">https://datausa.io/profile/geo/boston-ma/#economy</a></p>

## Preliminary Analysis:

In deliverable 1, we found the overall trend that Asian American population in MA continuously increases from 2000 to 2020. To discover some more specific information related to Asian American in MA, we look at different ethnic groups within Asian American, including: Chinese, Indian, Korean, and etc. Figure 1 below displays the population of 21 ethnic groups within Asian American in MA in 2000 and 2010, and their population percentage change in the two years. Looking at all the valid statistics on Figure 1, we found there is only one group's population -Hmong- decreases from 2000 to 2010. All other groups follow the overall trend we discovered in deliverable 1. By only considering increasing speed, we found Bangladeshi population triples in 10 years, which represents the fastest growing speed. By considering the number of population, we found Chinese is the group that has increased the most with its population increasing 42,352 in 10 years.

By looking at Figure 1, we notice five top Asian subgroups that can make up more than 80% of all Asian Americans, they are Chinese, Indian, Filipino, Vietnamese, Korean. Therefore, we decided to take a deeper look at the five major groups to look for more information about population change within Asian Americans.

	Race	2000	2010	%change
0	Chinese	89,521	131,846	47.3%
1	Indian	48,588	85,441	75.8%
2	Vietnamese	36,685	47,636	29.9%
3	Korean	19,469	28,904	48.5%
4	Cambodian	22,886	28,424	24.2%
5	Filipino	11,661	18,673	60.1%
6	Japanese	13,997	15,358	9.7%
7	Other Asian, not specified	9,025	14,256	160.0%
8	Pakistani	2,864	7,071	146.9%
9	Taiwanese	2,859	5,353	87.2%
10	Thai	2,747	4,712	71.5%
11	Laotian	4,449	4,530	1.8%
12	Nepalese	-	2,865	-
13	Bangladeshi	784	2,387	204.5%
14	Indonesian	1,063	1,379	29.7%
15	Sri Lankan	771	1,254	62.6%
16	Hmong	1,303	1,080	-17.1%
17	Burmese	-	1,072	-
18	Malaysian	346	593	71.4%
19	Bhutanese	-	544	-
20	Other Asian, specified	1,025	490	-

Figure 1: Asian American Ethnic Groups' Population in MA in 2000 and 2010

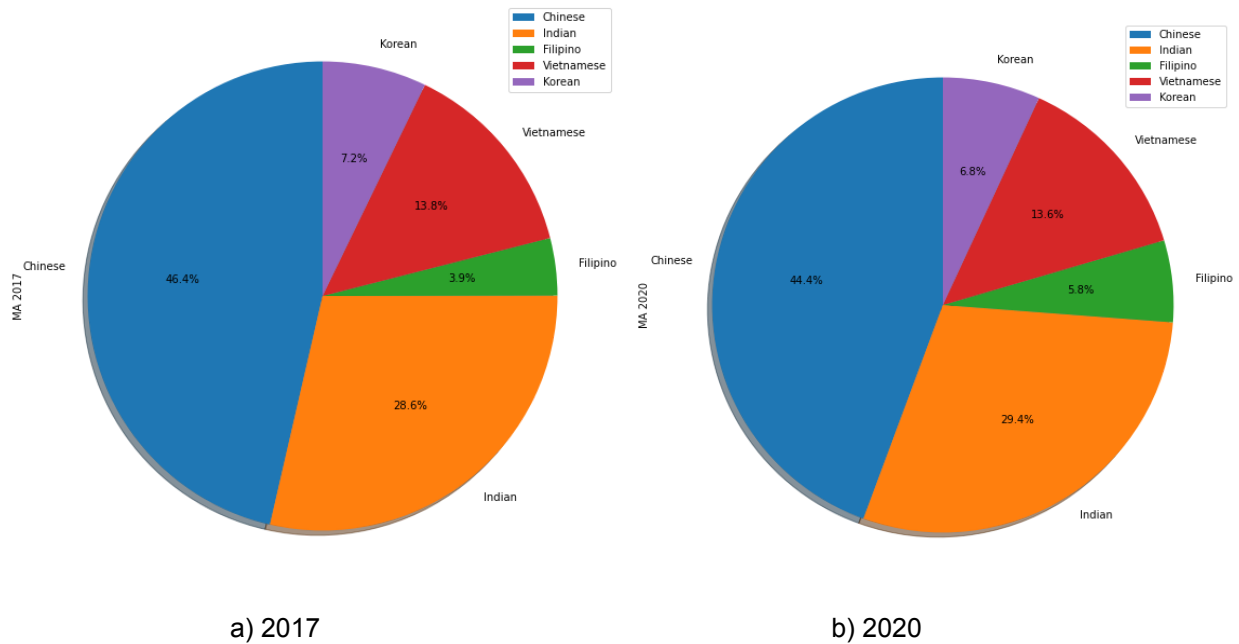


Figure 2: Percentage of Top 5 Asian American Ethnic Groups Population in MA in 2017 and 2020

In Figure 2, we try to see, within the top 5 Asian American subgroups, the percentage they individually take. As we can see, in both Figures, Chinese take the majority percentage, up to 50%. The second majority is Indian, up to 30%. By comparing Figure 2 and 3, we found Chinese took less percentage from 2000 to 2010, from 46.4% to 44.4%, whereas, Indian, Korean, Filipino all increased their percentage, and Vietnamese stayed almost the same. Although there is only a 2% decrease for the Chinese population, since the population base is quite large, 2% can somehow mean something as a trend of decrease. Therefore, we want to explore possible reasons for decrease later on.

After digging into top Asian American ethnic groups, we also look at whether there is a trend within different age groups of Asian American. In figure 3, we notice that the age group from 25 to 34 years old take the lead in percentage in MA in 2019. And the top three population groups have ages from 25 to 54, which are basically middle-aged crowd groups. It can fits to our discovery in the immigrant trend that a huge amount of immigrants come for jobs which are possibly in the middle-aged group.

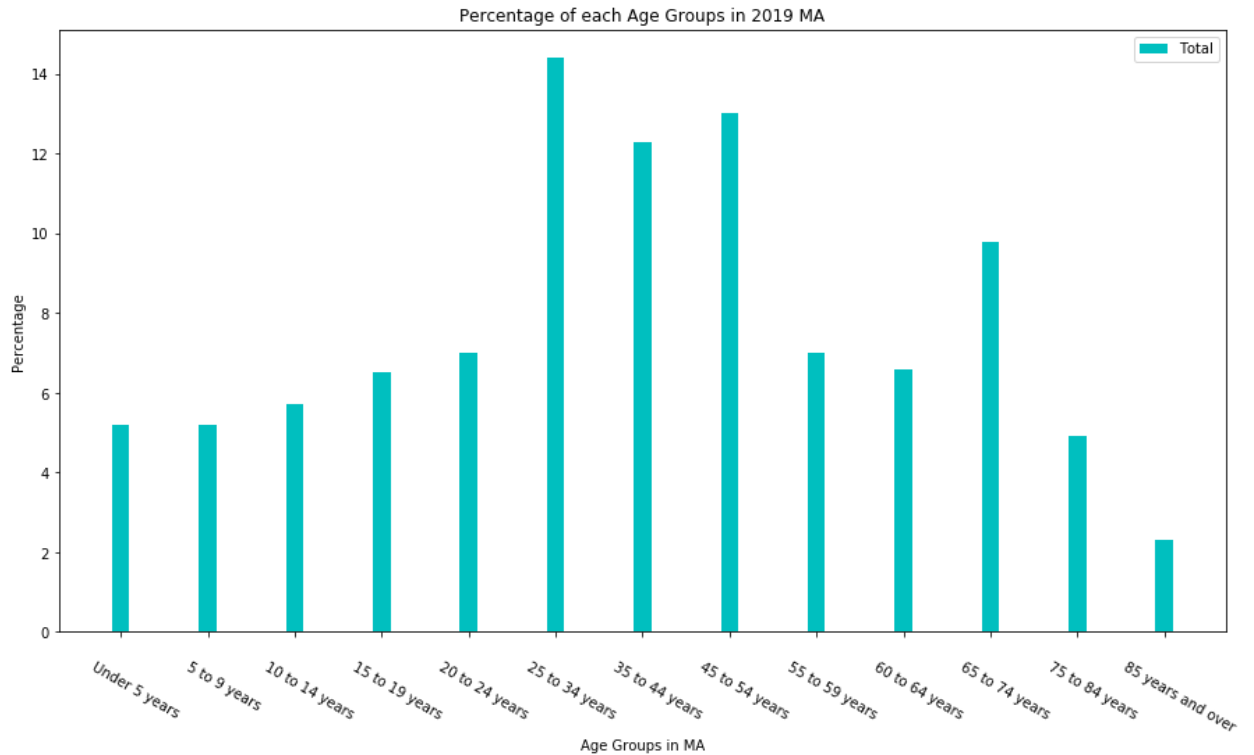


Figure 3: Asian Population Percentage of Different Age Groups in MA in 2019

To be more specific, we want to take a look at sex category of Asian American within different age groups. From figure 4, we could infer that from age 15 to 85 (teenagers and adults), the number of Asian females is greater than the number of Asian males. While for newborns and children from under 5 to 14 years old, the number of males is slightly greater than the number of females. Based on this trend, we can conclude that in MA 2019, the female Asian population is more than male Asian population. Since we only look at one year 2019, this trend might not be representative, so it makes sense to look for more data about Asian population of different sex in other years in order to get a more reliable trend about sex age distribution. Then we can draw some conclusions and analyze some reasons for the trends. Here, we only take a brief look and start to realize there might be some trends within sex-age of Asian population in MA.

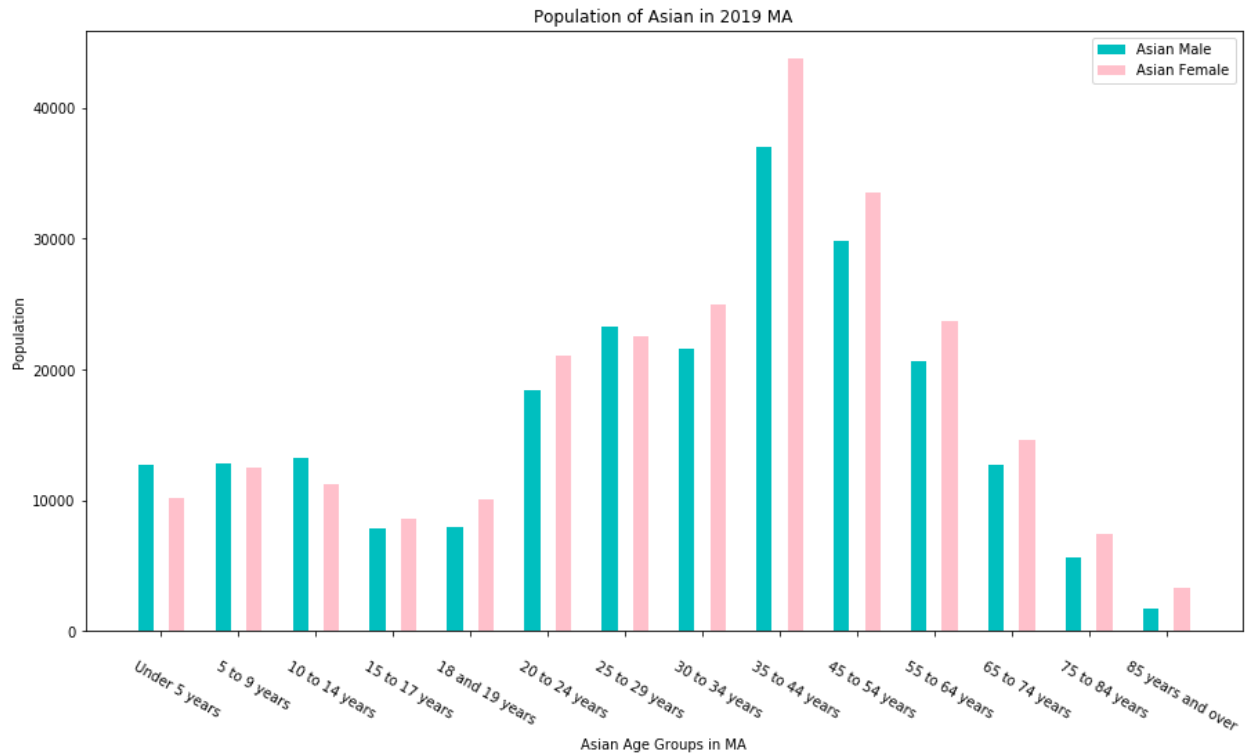


Figure 4: Asian Population Percentage of Different Age Group in 2019 MA (Category by sex)

Moreover, in deliverable 1, more than finding that Asian population has increased over the past 10 years, we also answered part of the question: why Asian population has increased over the time. Our answer is because of immigration from Asia. Now we want to find more reasons. And our follow up question is: does the economy play an important role in the population increase? From Figure 5, we used median household income data that was collected from Massachusetts, Boston and the United States. According to the line chart, we can see that people who live in Massachusetts and Boston have more average household income than the U.S. average household income. Therefore, we conclude that the economy might be an important reason that attracts the Asian population and immigrants.

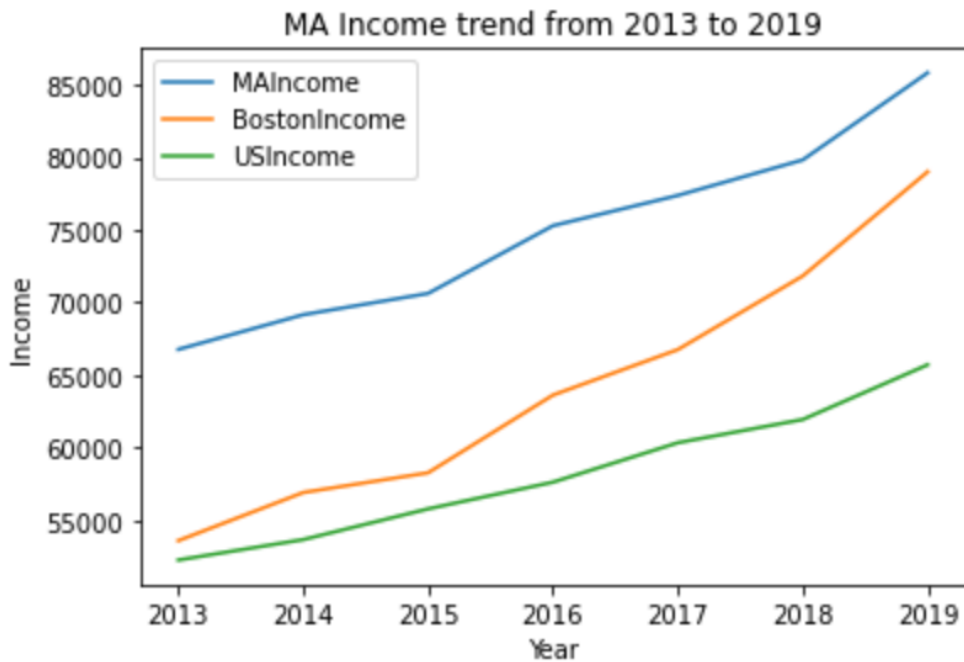


Figure 5: Total MA Income Change from 2013 to 2019

In Figure 6, we use Asian population as primary Y axis (left), MA median household Income as secondary Y axis (right) and time (2013 to 2019) as X axis. Based on the graph, we can see that both Asian population and median household income have steadily grown over time. From 2013 to 2015 and 2017 to 2018, the Asian population grew rapidly. In the following years 2015 to 2016 to 2018 to 2019, MA household income increased tremendously followed by Asian population increase. We might be able to conclude that Asian population growth drives MA income growth.

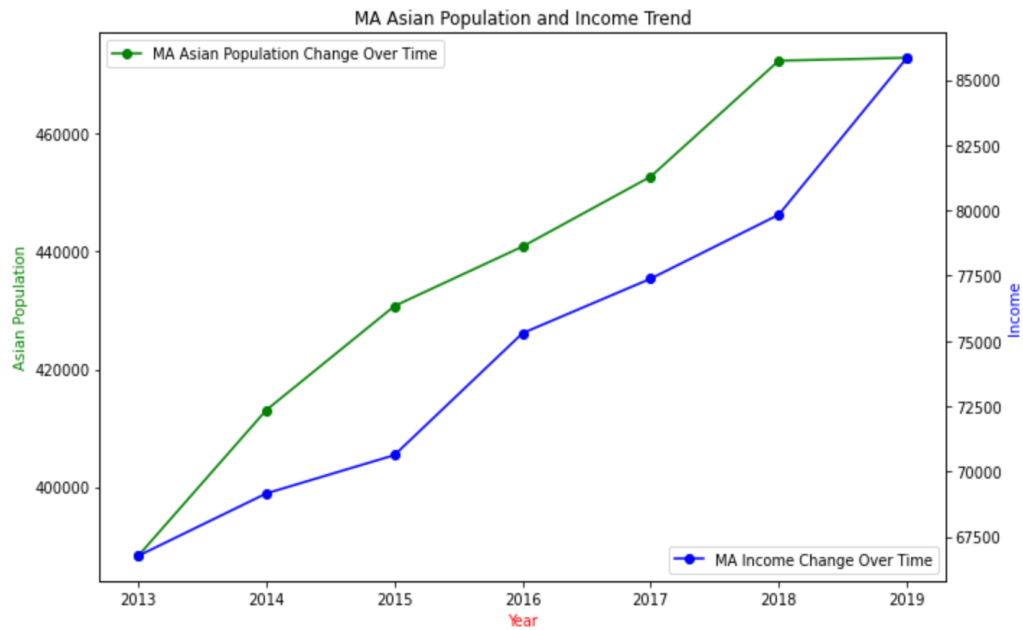


Figure 6: Total MA Asian Population Change and their Income Change from 2013 to 2019

We also noticed that there was a mass increase of the asian population over the years. We wanted to notice the wages overall for all of the races and try to find out the correlation between wages and demography. As we see that most of the jobs are under 6000. That follows our common sense that high wages jobs are limited. We can see that there is a large amount of wages under 20000. Mass jobs that are available for small wages, which might be a reason for the population increase in the nation.

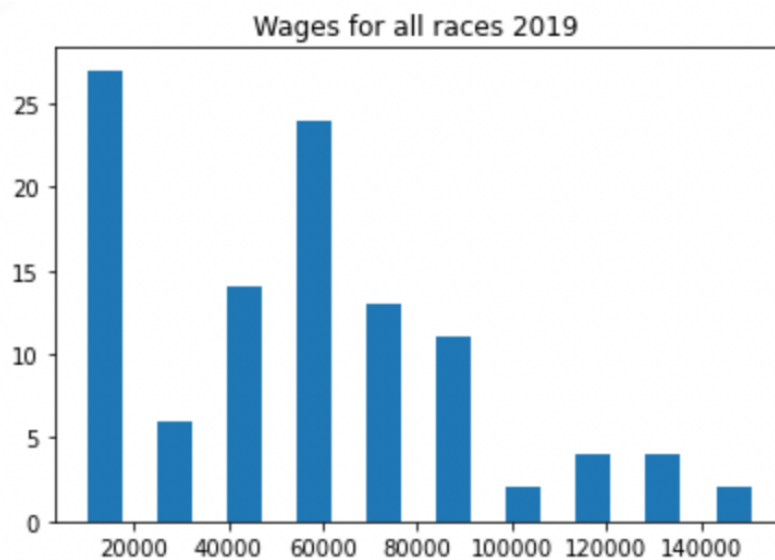


Figure 7:

The graph shows that asian make up most of the population in Massachusetts for higher incomes for minorities compared to other races. They make the most amount of money compared to the other races. Their income is mostly around 20000 and 90000 which is a lot compared to other races. This might indicate that Asians tend to have jobs that are about low-paid and mid-rated. This shows that there are only a few Asians who can have high wages. Most of Asian population got a middle range wage. This relates to the income analysis of Asian and we will continue to do some research and try to find out the reason for this observation.

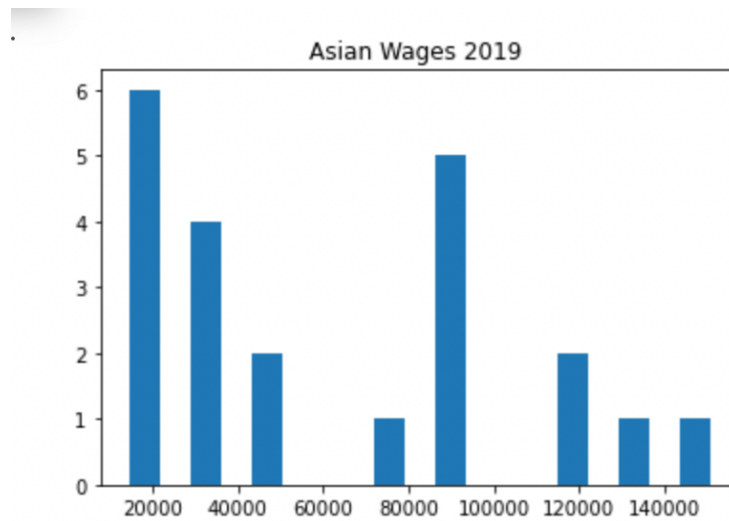


Fig 8



### Key Question:

What might be the reason for the increasing Asian population in Massachusetts and the Boston Area?

### Answer:

Based on the analysis of Asian population and Total population in the Boston Area, we found that the trend of Asian population in the MA and Boston Area is increasing fast. Therefore, we decided to analyze the increasing trend by the factor of wage and income.

The first fact we noticed as one reason for the increase in Asian population in the MA and Boston area is that the average income in these areas is much higher than the average income of the United States. From Fig 5, we can see that the initial average wage in 2013 in MA or Boston is much higher than it of the United States. In addition, the growth rate of the average income is also higher. Thus, the generally high income in MA and Boston could be one reason that attracts so much new Asian residences to MA and Boston.

Another reason for the rising population of Asians in the Boston area could be that the MA is willing to offer more jobs with both low payments and decent payments. From Fig 6 and 7, we could see that most of the jobs with high income are offered to the Asian groups. Thus, with the relatively high wage compared to the whole country and the decent paid jobs, whether old or new residents are willing to stay in the Boston area.

The general trend for Asian population is promising in the Boston area. From Fig 2 and 3, generally each Asian subgroup has experienced an increase in the past few years, and the distribution of the age groups is in good shape. Most people are in the age of workforce, and the aging population is not large.

## Updated Potential Risks and Limitations:

1. The census data is incomplete. Many of the dataset from the census is incomplete and either can not focus on Asian subgroups or can not focus on the Boston area. The datasets found that can focus on the Asian subgroups can only be narrowed down to the MA region. Even with the dataset that can be narrowed down to specific Asian groups, the divisions are still not complete, and may only include one or two subgroups but not all.
2. The features are random for subgroups. Different tables from the census data might have different features. For example, one table I found is about the population of each age and sex group of Asian in MA only. Then I would like find another dataset about population of each age and sex group of total population in MA and make comparisons, but there is only information about population with age groups but no sex group.
3. Some of the project limitations that could be is that we are only looking at the year 2019 and it would vary amongst other years depending on the economy. For example, during 2020 the Coronavirus pandemic happened which would affect job salary. The data is different for each year.
5. From Fig 6 we have an assumption that Asian population growth drives MA income growth. It's true from 2013 to 2019, but since we can only find 7 years Asian Population and Income data, we still don't know if our assumption is just a coincidence or if we can apply it to all the years.
6. The amount of Asian population in Boston is very small compared to other races. It is difficult to see a trend because of so little data compared to if we were analyzing race groups in New York. Boston is not a highly populated Asian area.
7. When looking at the census data and looking at the wages, there are not enough resources that have wages and asian ethnicity participants in the data for Boston. So, it can be difficult to find data for race and wage trends.