CS506-Project

BCNC - Asian Impact & Equity – Team1

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Motivation: Better understanding of living conditions of Asians in Massachusetts
Goals: Finding out correlation between employment and other features in Asians in MA
Background: Lack of access and understanding around Asian data

Data

Data used

- What data?
  - ACS (American Community Surveys) from 2015 to 2019
  - CPS (Current Population Survey) from 2015 to 2019
  - Dataset that merges ACS and CPS together
    - Total number of rows in the dataset(Asians in MA): 23830
    - Number of people in labor force: 16983
    - Number of people who reported their income: 20000
    - Number of people who reported their wage/salary: 13273

- How did we collect and handle data?
  - Tried many datasets websites, finally locating ACS and CPS
  - Choose useful features
  - Change reserved features codes into meaningful words
  - Merge ACS and CPS

SAMPLES:	5	(hide)	Change

Sample	Density	Note
2015 ACS	1.0%	
2016 ACS	1.0%	
2017 ACS	1.0%	
2018 ACS	1.0%	
2019 ACS	1.0%	

VARIABLES:	24	(hide)	Change

Type	Variable	Label	Case Selection
H	YEAR	Census year	--
H	SAMPLE	IPUMS sample identifier	--
H	CBSERIAL	Original Census Bureau household serial number	--
H	STATEFIP	State (FIPS code)	details
H	COUNTYFIP	County (FIPS code)	--
H	CITY	City	--
P	SEX	Sex	--
P	AGE	Age	--
P	RACE (general)	Race [general version]	--
P	RACED (detailed)	Race [detailed version]	details
P	RACASIAN	Race: Asian	details
P	EDUC (general)	Educational attainment [general version]	--
P	EDUCD (detailed)	Educational attainment [detailed version]	--
P	EMPSTAT (general)	Employment status [general version]	--
P	EMPSTATD (detailed)	Employment status [detailed version]	--
P	OCC2010	Occupation, 2010 basis	--
P	IND	Industry	--
P	WKSWORK2	Weeks worked last year, intervalled	--
P	UHRSWORK	Usual hours worked per week	--
P	INCTOT	Total personal income	--
P	INCWAGE	Wage and salary income	--
P	INCBUS00	Business and farm income, 2000	--
P	PWSTATE2	Place of work: state	--
P	PWCOUNTY	Place of work: county	--

Data

Data used

- What data?
  - ACS (American Community Surveys) from 2015 to 2019
  - CPS (Current Population Survey) from 2015 to 2019

- How did we collect and handle data?
  - Choose features -> Features codes to words -> Merge

Challenges encountered

- Dataset is small
- Dataset is skewed – most samples are Chinese then Indian
- CPS dataset is a voluntary survey, so it is biased on the sample selection
- Data are based on multiple years, possibly some people responded the surveys multiple times
- ACS and CPS use different columns names for same information, which causes difficulty when merging

```
Classify by Asian Subgroups:
Chinese         9316
Indian          5627
Other           3265
Vietnamese      2445
Korean          1468
Filipino         800
Japanese         627
Thai             186
Indonesian        96
```

Analyses & Methods

Analyses

- What affects Asian Salary?
  - Difference in Asian subgroups
  - Sex
  - Education
  - Age

- What affects Asian Employment?
  - Majors
  - Culture
  - Salary

Methods

- Models to see the correlation among salary and factors

- Various charts for Visualization of trends and correlations

```
Total num of rows in the dataset: 23830

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Classify by City:
Unknown          17202
Boston            3611
Lowell            1080
Cambridge         1076
Worcester          663
Springfield        198
Name: CITY, dtype: int64

Classify by Sex:
Female    12607
Male      11223
Name: SEX, dtype: int64

Classify by Asian Subgroups:
Chinese        9316
Indian         5627
Other          3265
Vietnamese     2445
Korean         1468
Filipino        800
Japanese        627
Thai            186
Indonesian       96
Name: RACED, dtype: int64

Classify by Employment Status:
Employed            12337
Not in labor force   6847
Unemployed            573
Unknown              4073
Name: EMPSTAT, dtype: int64
```
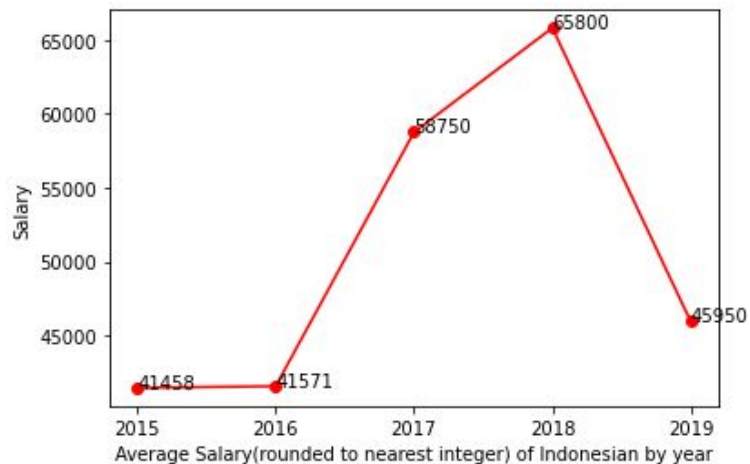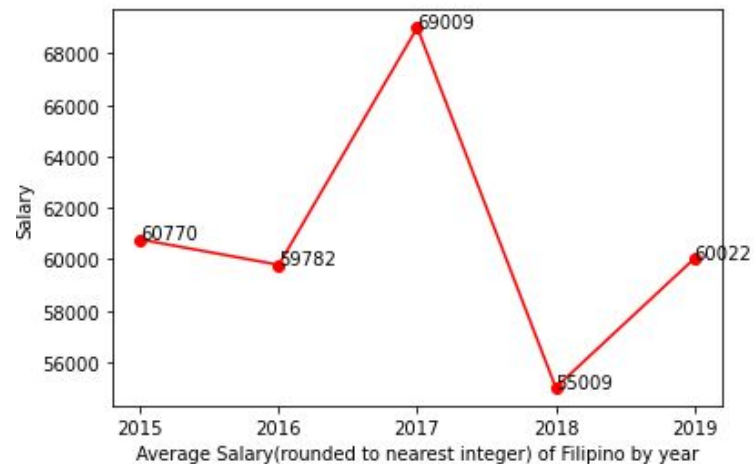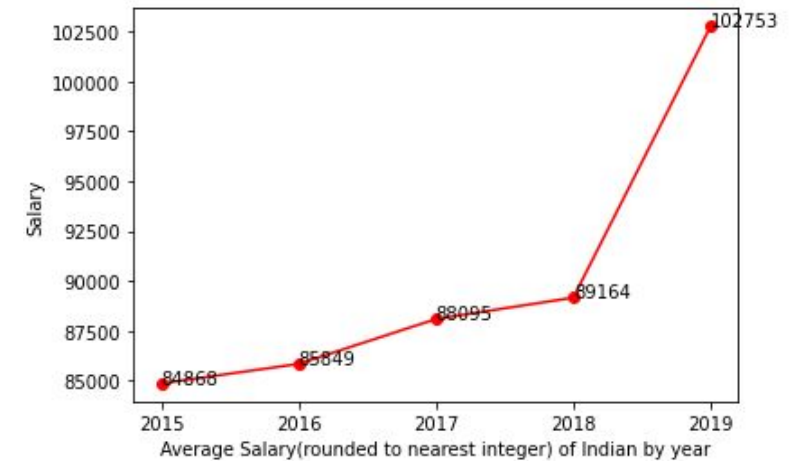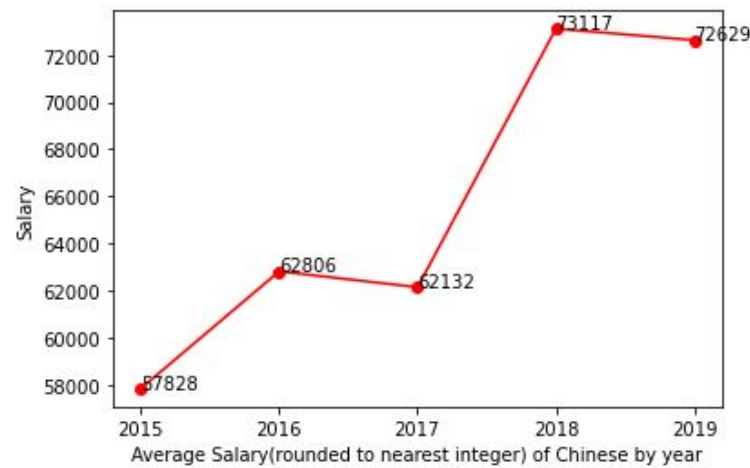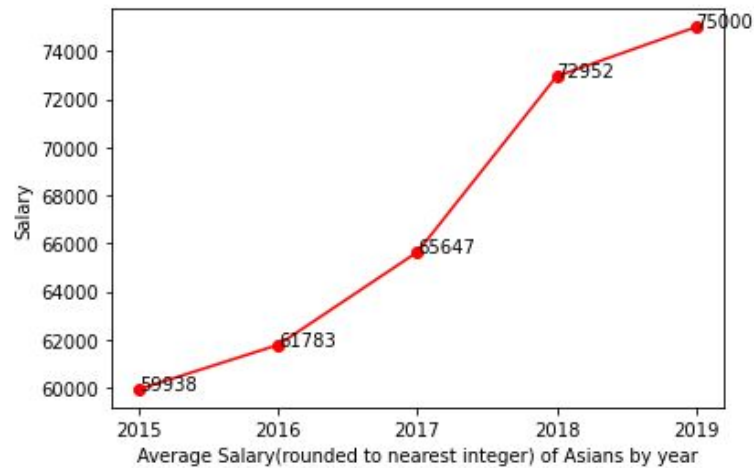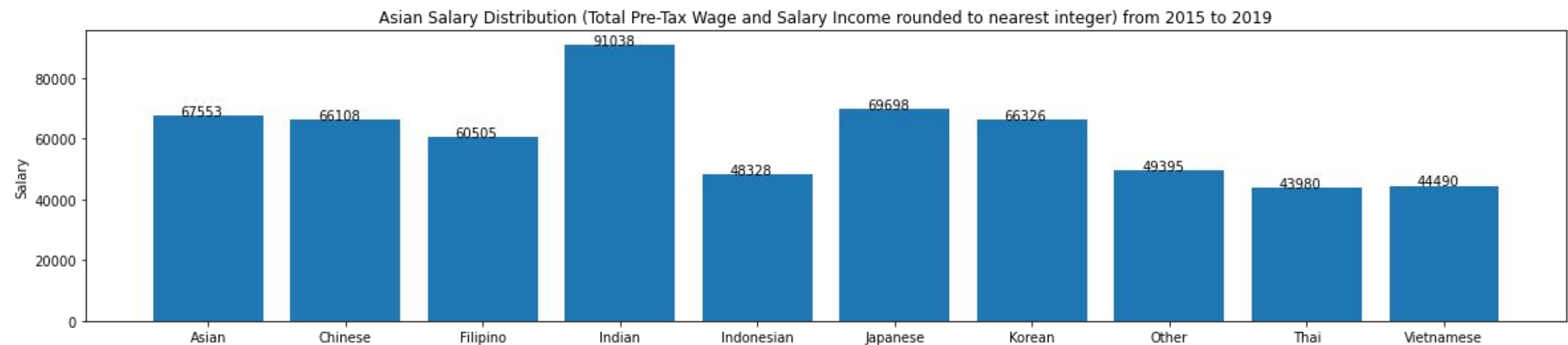
Results - Salary & Occupation distribution

Average Salary for Asians and Asian Subgroups
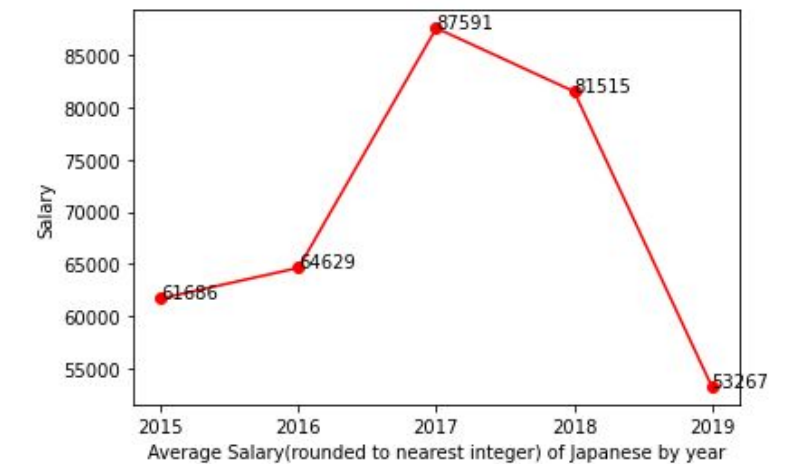
Results - Salary & Occupation distribution

Asian Salary Distribution

Asian Salary Distribution (Total Pre-Tax Wage and Salary Income rounded to nearest integer) from 2015 to 2019
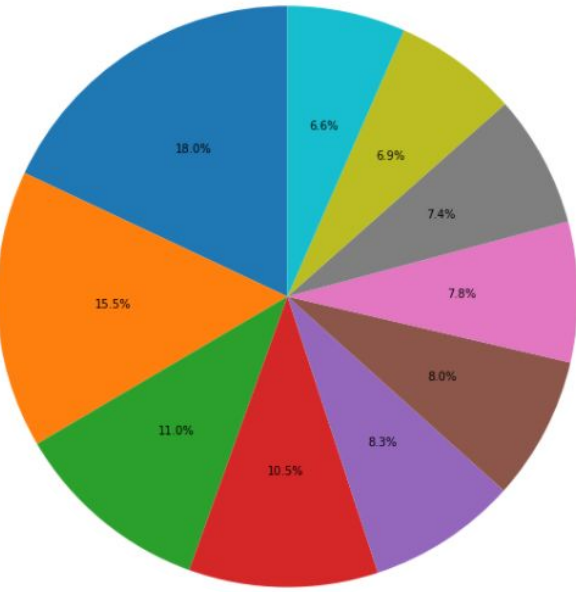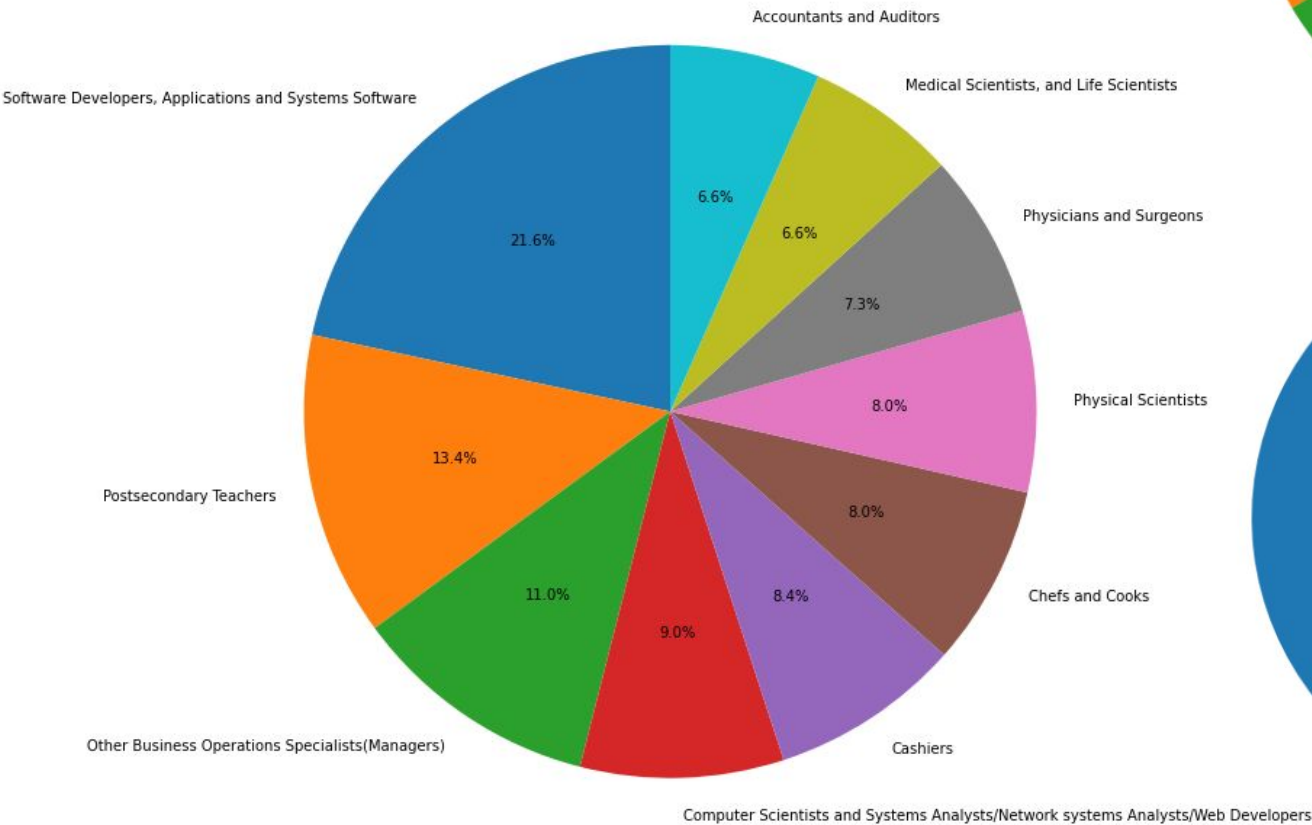
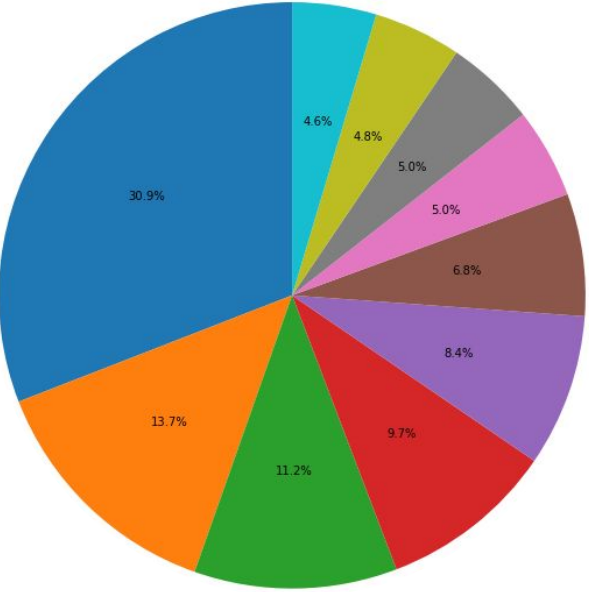# Results - Salary & Occupation distribution

Distribution of Asians and Asian Subgroups

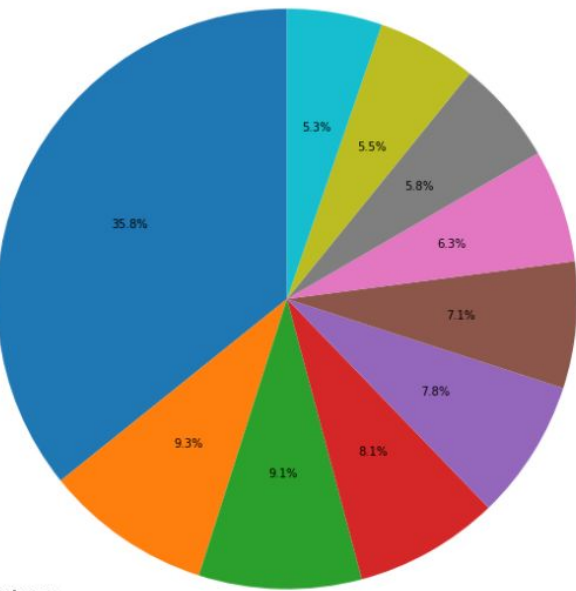There are 4210 people work as top 10 occupations, about 0.3171852633165072 of the total laborforce

Distribution of Top 10 Occupations among Asian

Accountants and Auditors

Medical Scientists, and Life Scientists

Physicians and Surgeons

Physical Scientists

Chefs and Cooks

Cashiers

Computer Scientists and Systems Analysts/Network systems Analysts/Web Developers

Other Business Operations Specialists(Managers)

Postsecondary Teachers

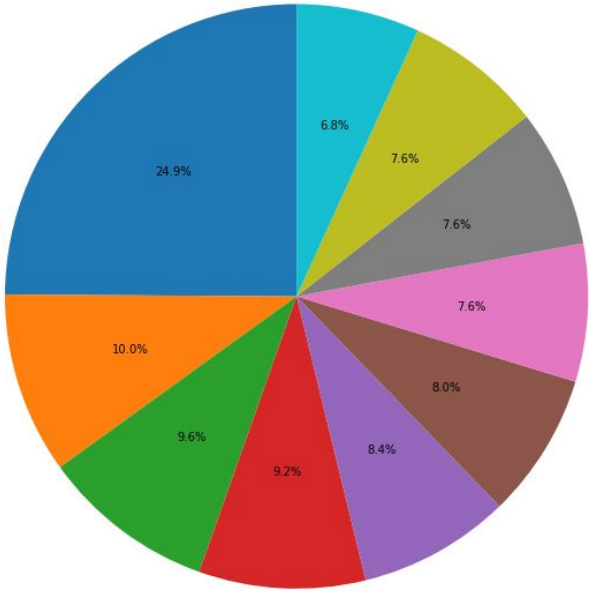Software Developers, Applications and Systems Software

Distribution of Top 10 Occupations among Chinese

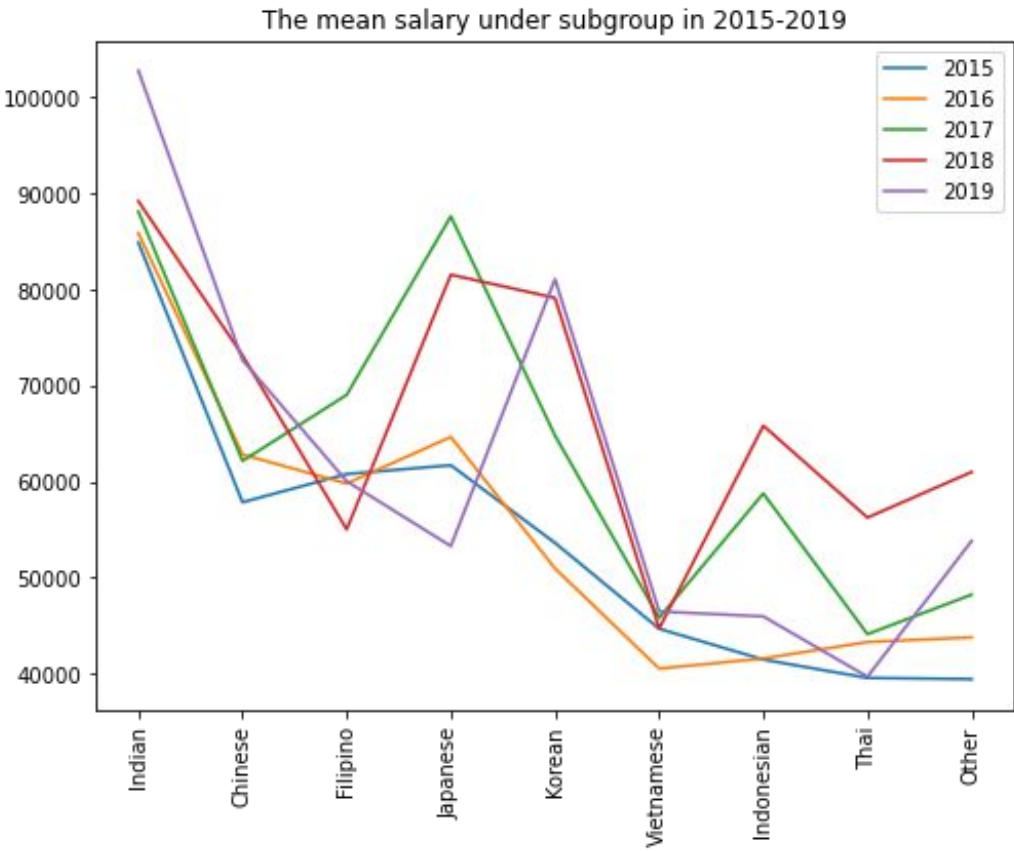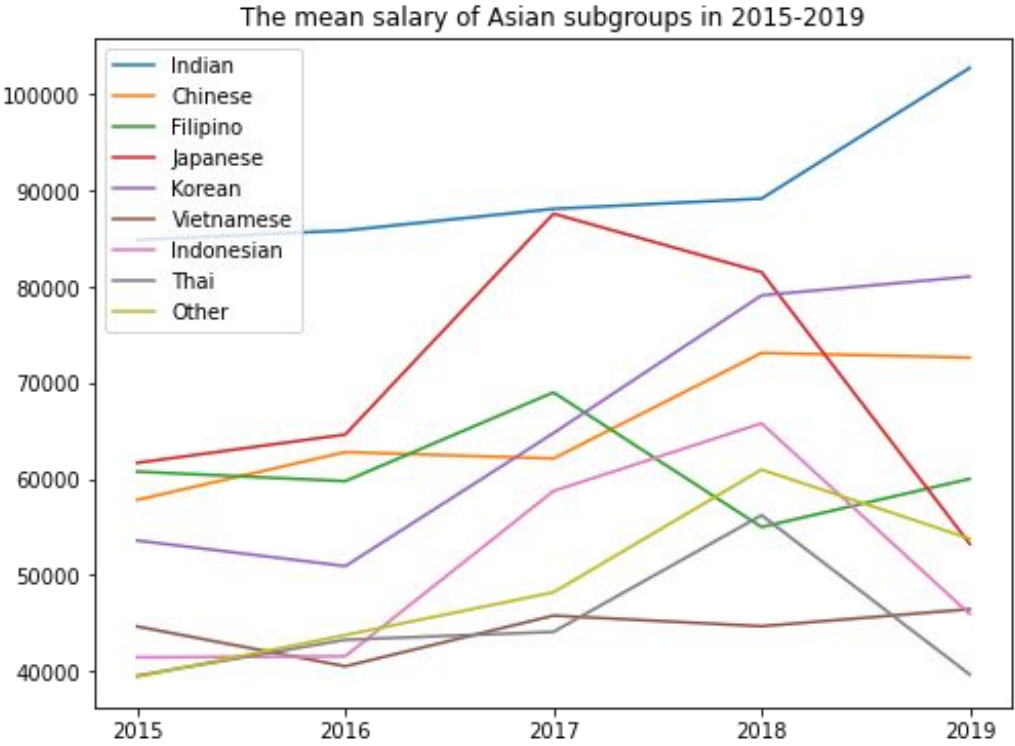Distribution of Top 10 Occupations among Indian

Distribution of Top 10 Occupations among Vietnamese

Distribution of Top 10 Occupations among Korean

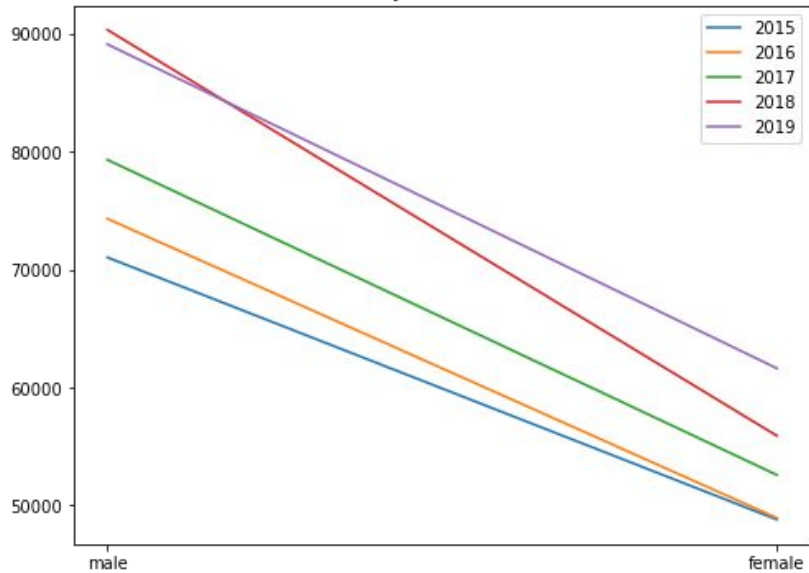# Results - Correlation between salary and some features
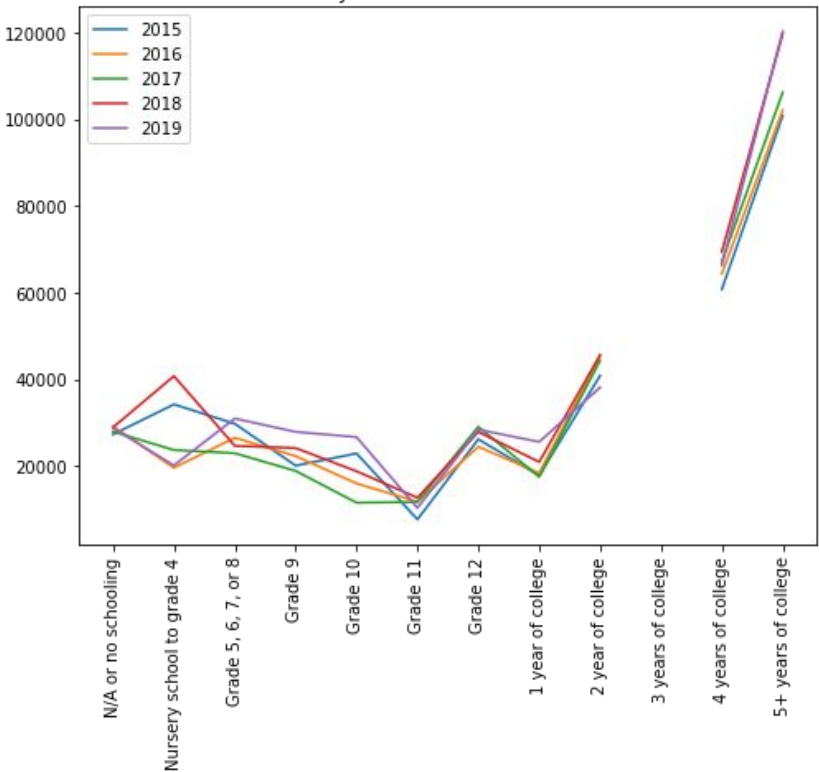
Mean salary of Asian subgroups

Results - Correlation between salary and some features
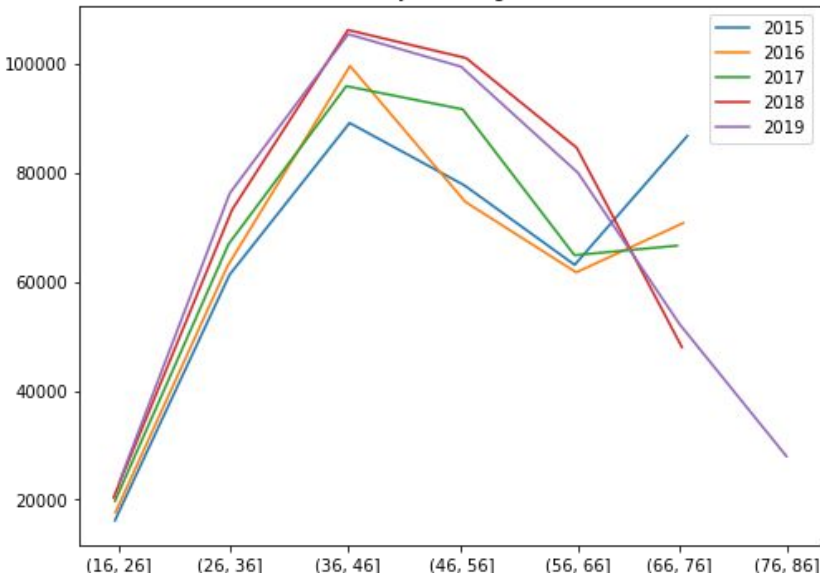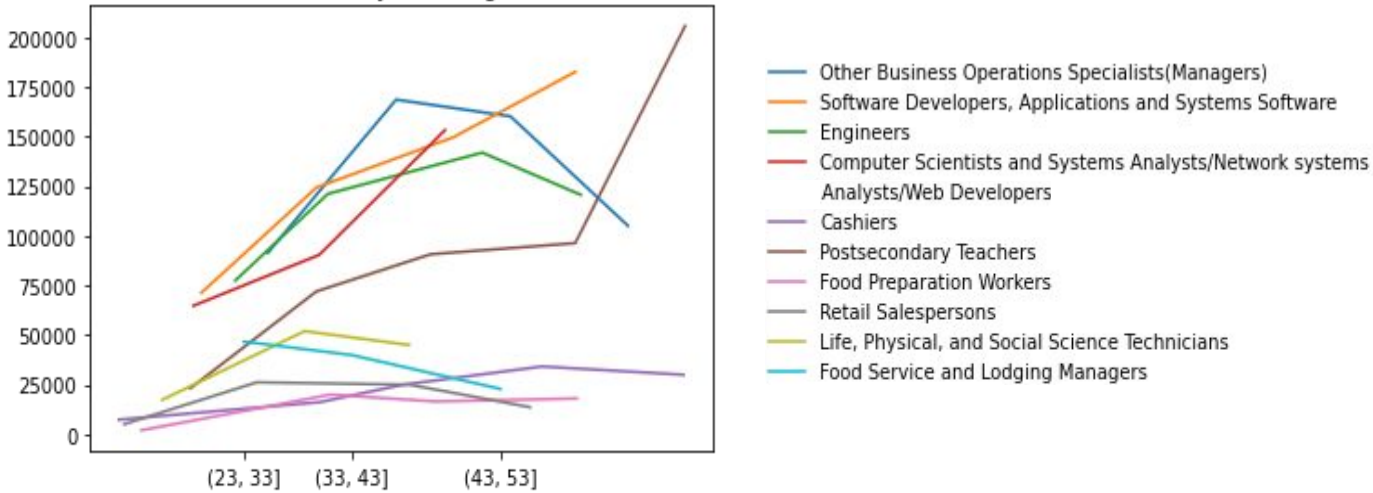
Mean Salary under Sex, Education, Age

Results - Correlation between salary and some features

Mean salary of various job under age

The mean salary under age in 2019

- Other Business Operations Specialists(Managers)
- Software Developers, Applications and Systems Software
- Engineers
- Computer Scientists and Systems Analysts/Network systems Analysts/Web Developers
- Cashiers
- Postsecondary Teachers
- Food Preparation Workers
- Retail Salespersons
- Life, Physical, and Social Science Technicians
- Food Service and Lodging Managers

The mean salary under age in 2019

- Registered Nurses
- Elementary and Middle School Teachers
- First-Line Supervisors of Sales Workers
- Managers in Marketing, Advertising, and Public Relations
- Computer Programmers
- Assemblers and Fabricators
- Financial Managers
- Other Teachers and Instructors
- Customer Service Representatives
- Management Analysts
- Physicians and Surgeons
- Secretaries and Administrative Assistants

The mean salary under occupations in 2015-2019
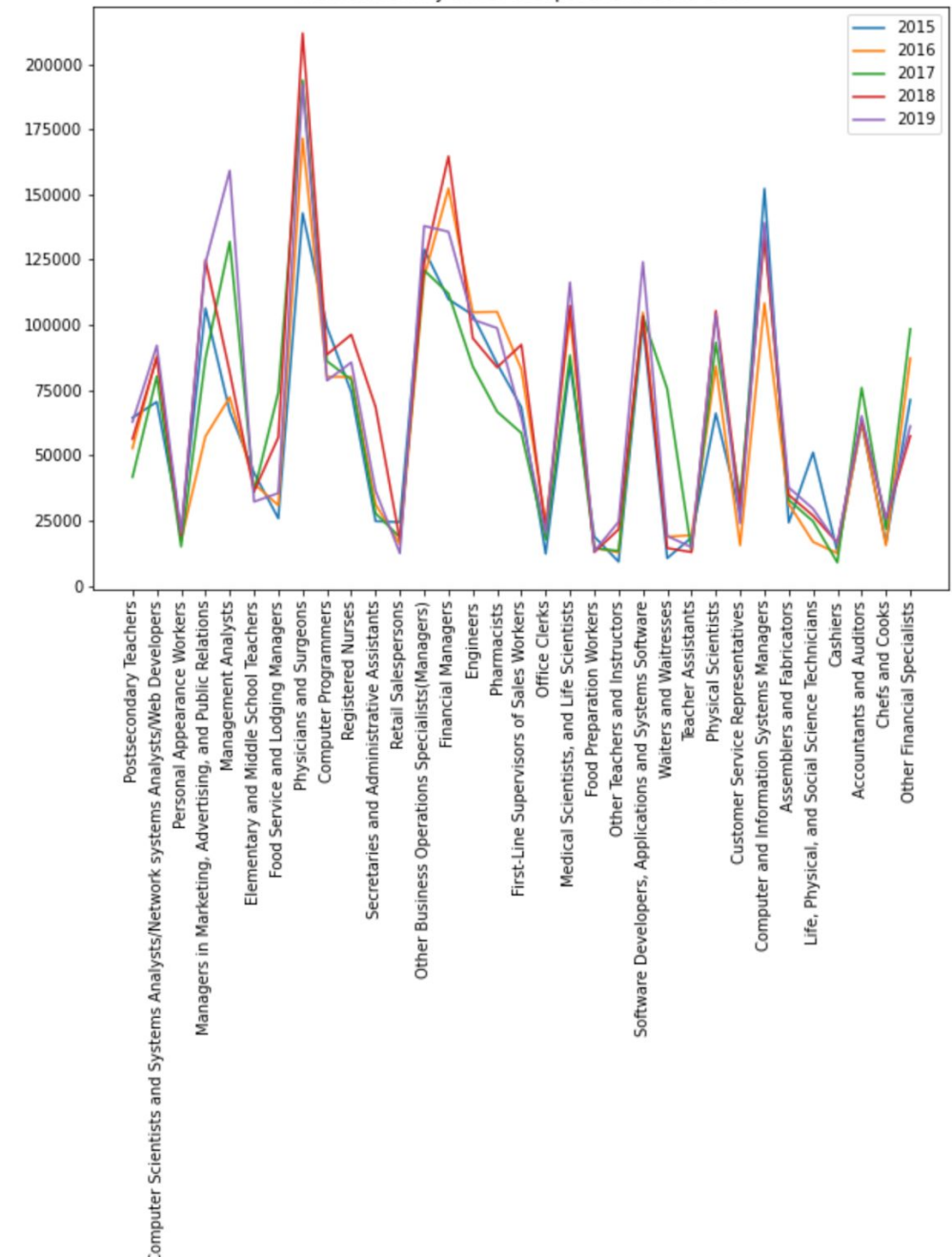
Conclusion

Conclusion relate to our goals

- Better social status among Asian people
    - Earn more and more in recent years
    - More Asians work in high skilled jobs

- Difference with other races in some points
    - Preference in CS related area when choosing jobs
    - Larger gender inequity among Asian in the respect of salary

Prediction

- CS related jobs are still in trend
- Salary gap between Asian females and males keeps shrinking

Future work

- Build models with various features

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Thank you

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