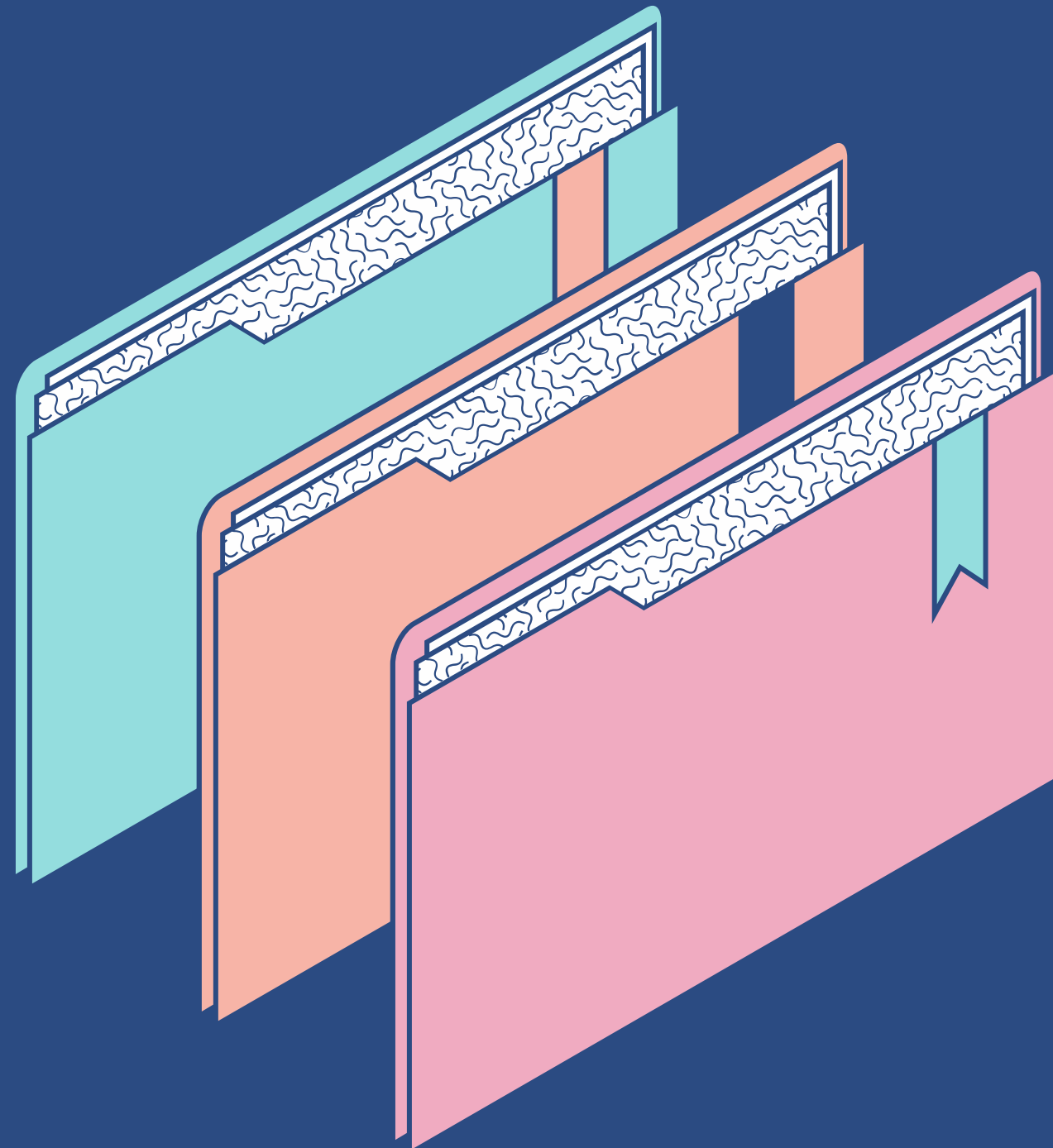




Cole Barnes, Debolina Bhaumik, Ryan
Cheng and Kanu Madhok

Bank Loan Modeling

What client criteria is most important in
getting personal loan offers accepted?



Criteria

How is personal loan acceptance affected by the following?

- Income Level
- Age
- Education Level
- Family Size
- Mortgage Status
- Zip Codes

Broad look at income level against personal loan acceptance

- Data was grouped into categories for clients based on whether or not they had a personal loan
- Average income of clients without a personal loan: \$66,237.39
- Average income of clients with a personal loan: \$144,745.83

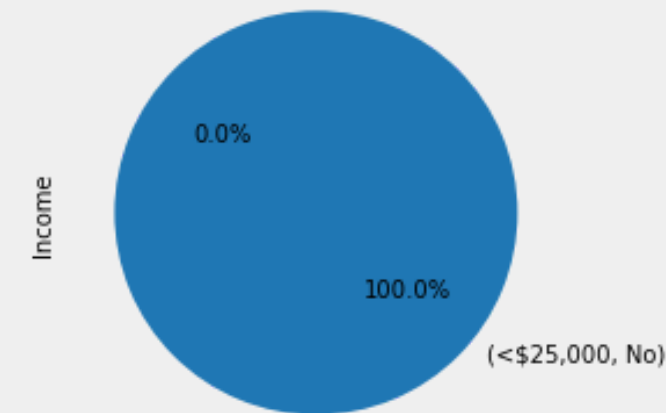




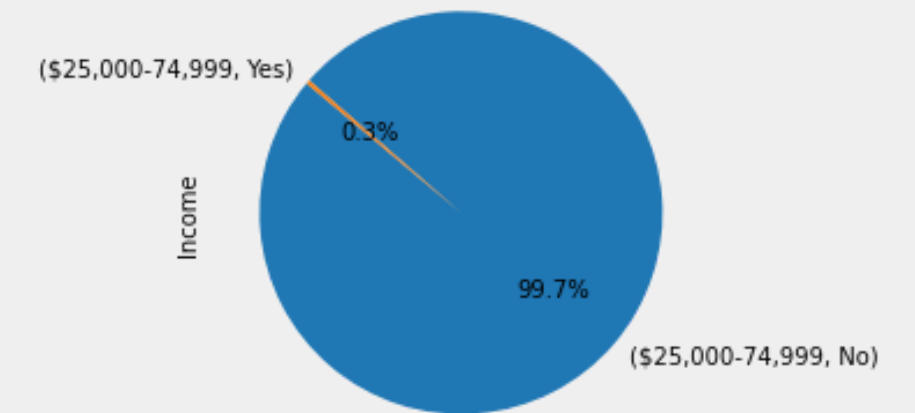
Detailed look at income level against personal loan acceptance

- Clients separated into bins based on their income level
- Percent of clients with and without a personal loan from each bin put into pie charts
- As each income bracket increases, the percentage of clients with a personal loan increases

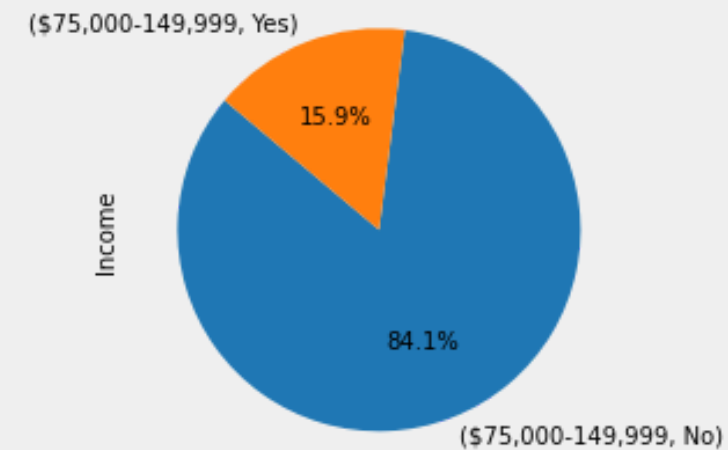
Personal Loan Percentage - Under \$25,000 Income



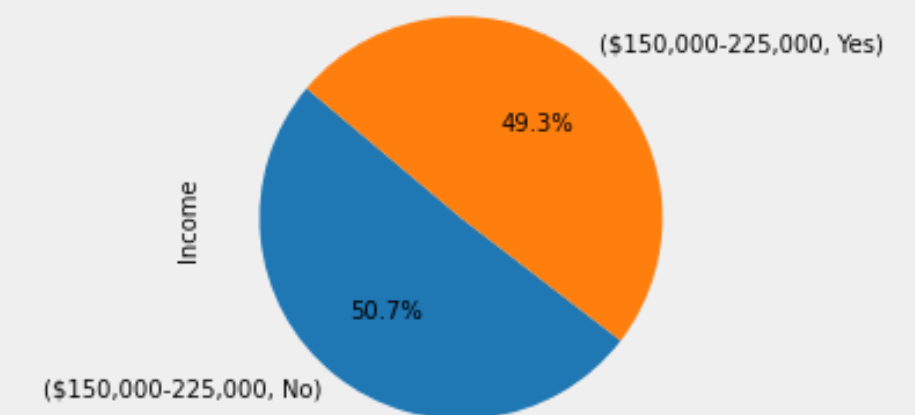
Personal Loan Percentage - \$25,000-74,999 Income



Personal Loan Percentage - \$75,000-149,999 Income

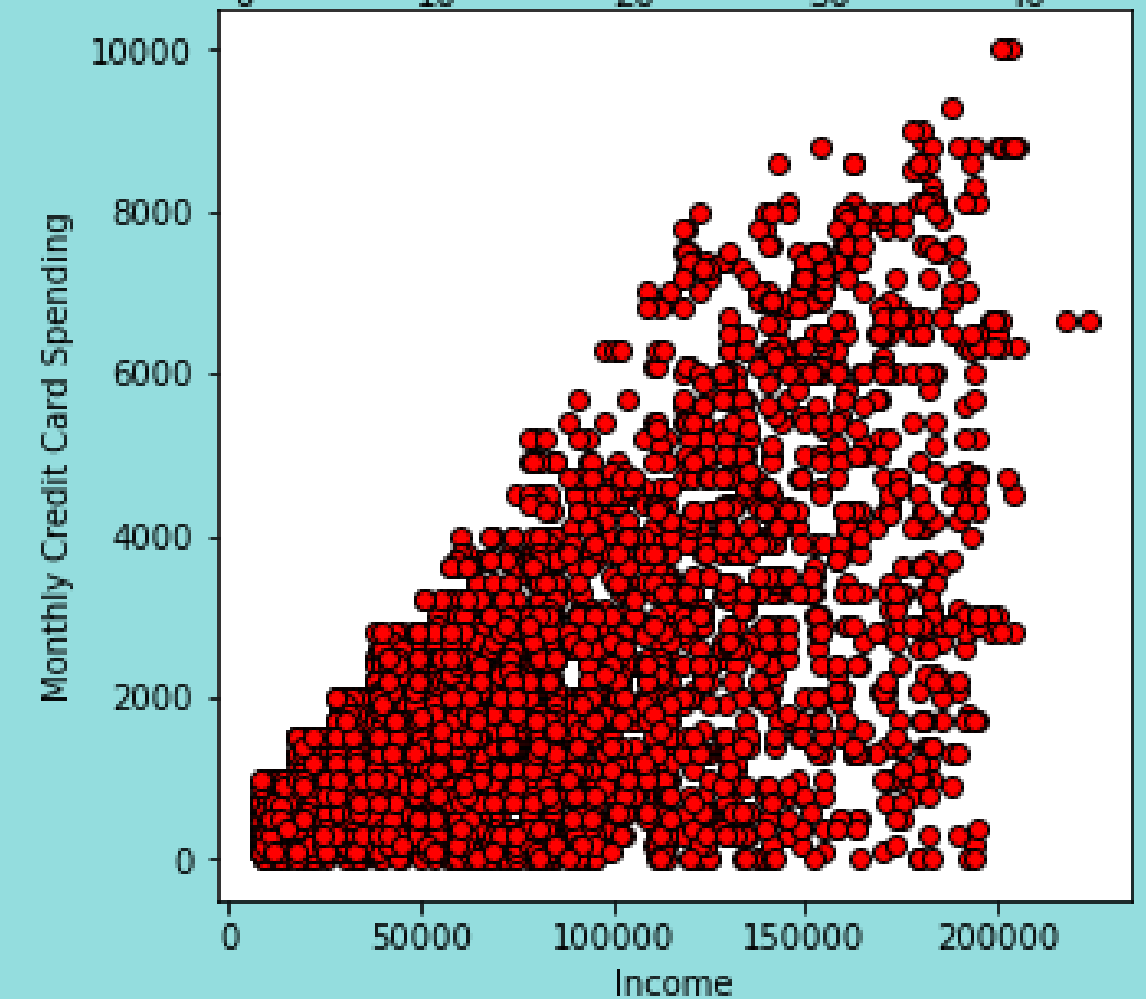
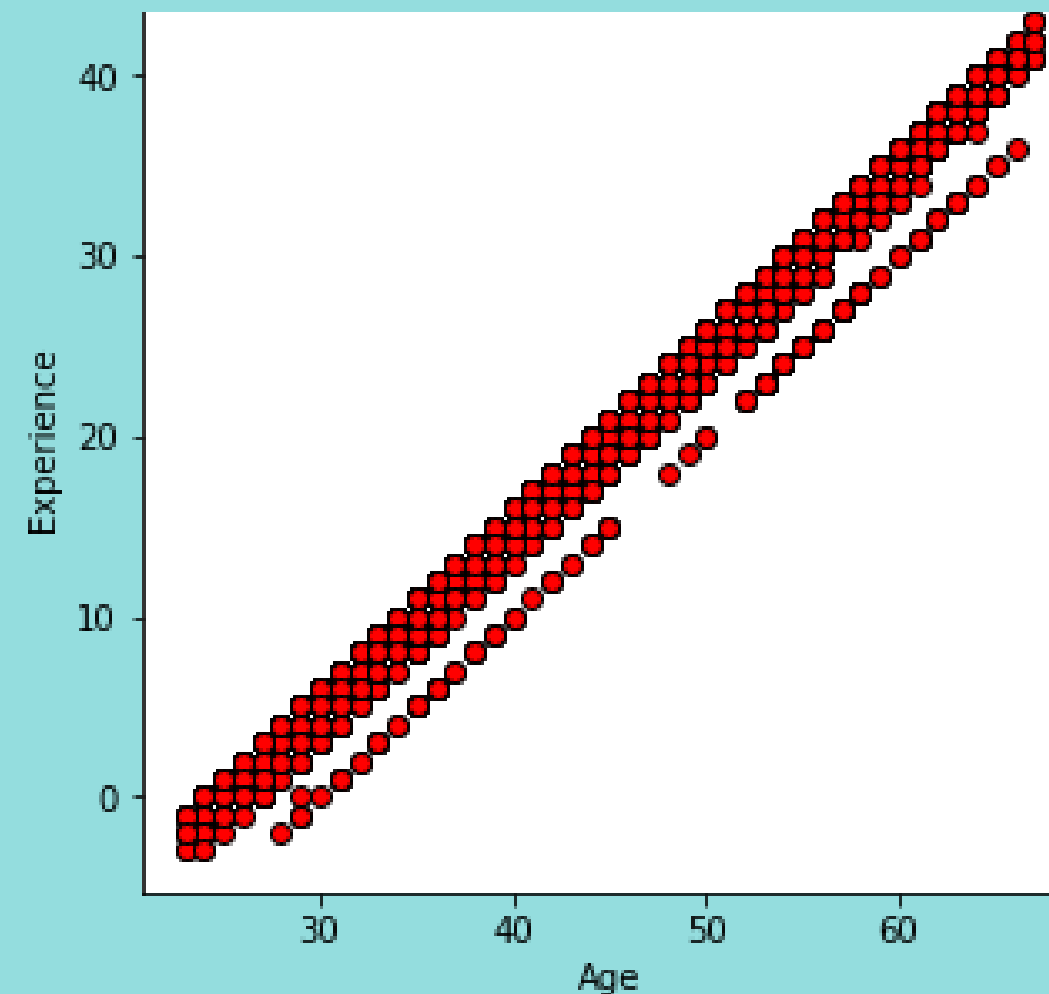
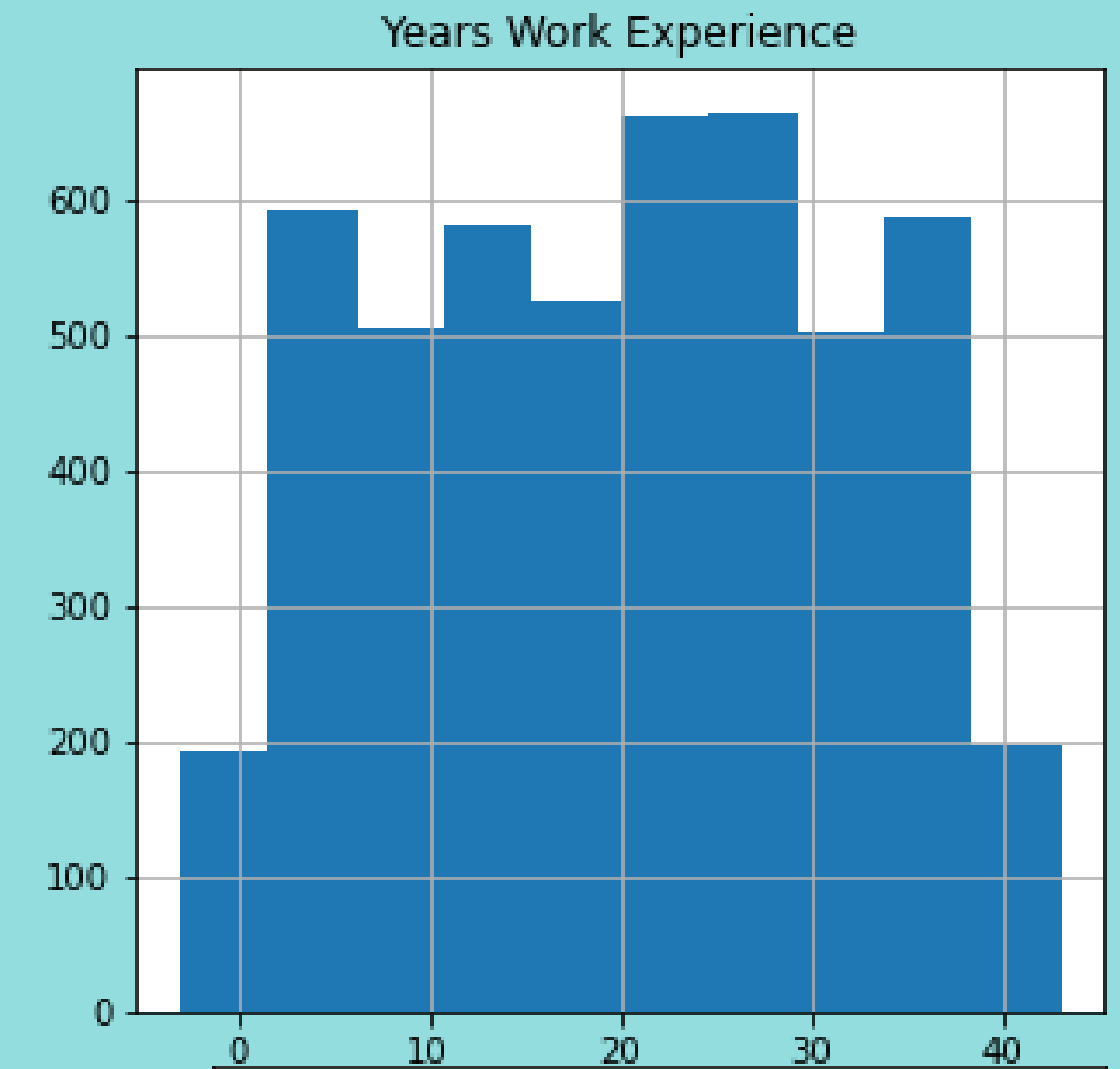
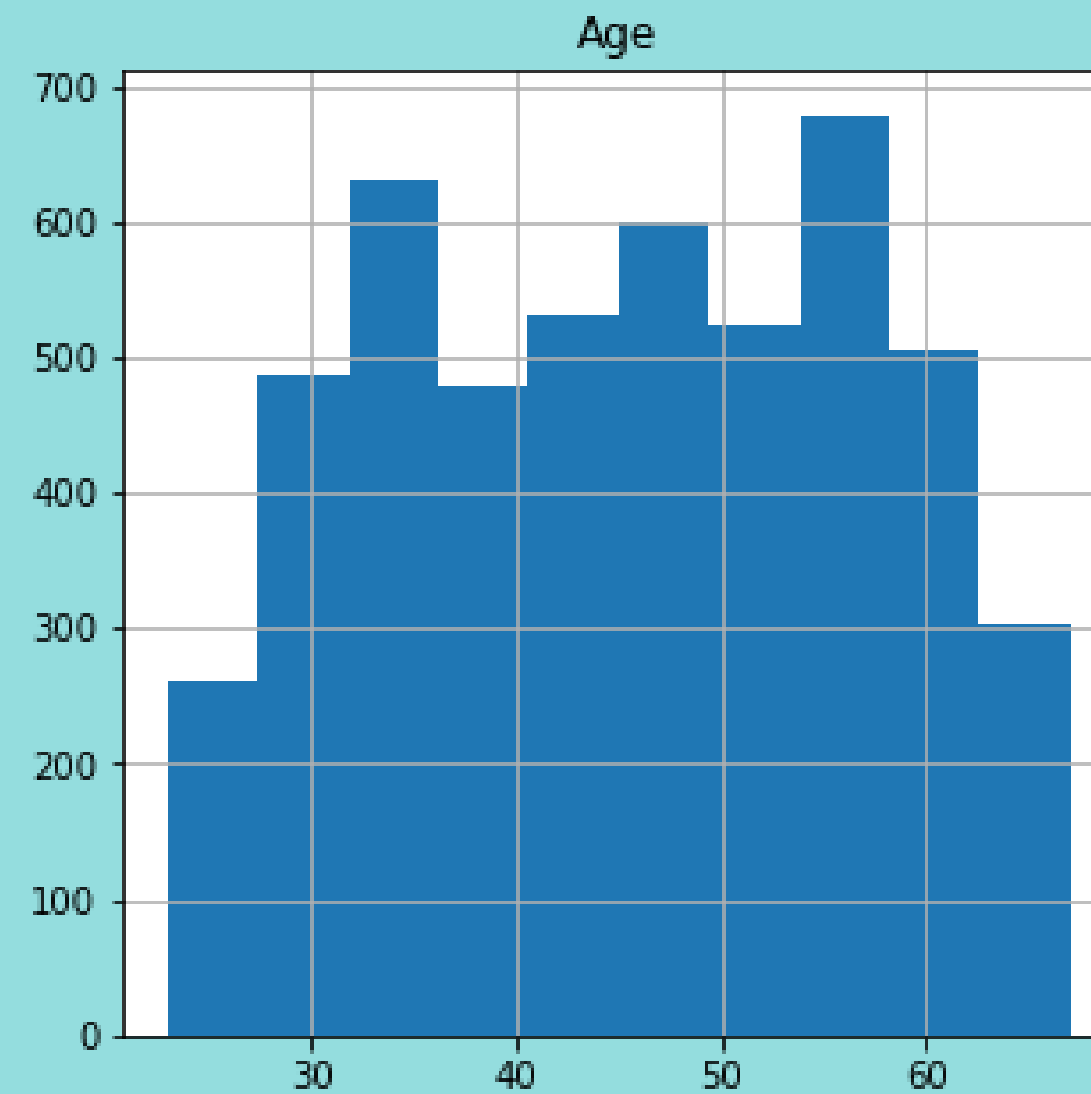


Personal Loan Percentage - \$150,000-225,000 Income

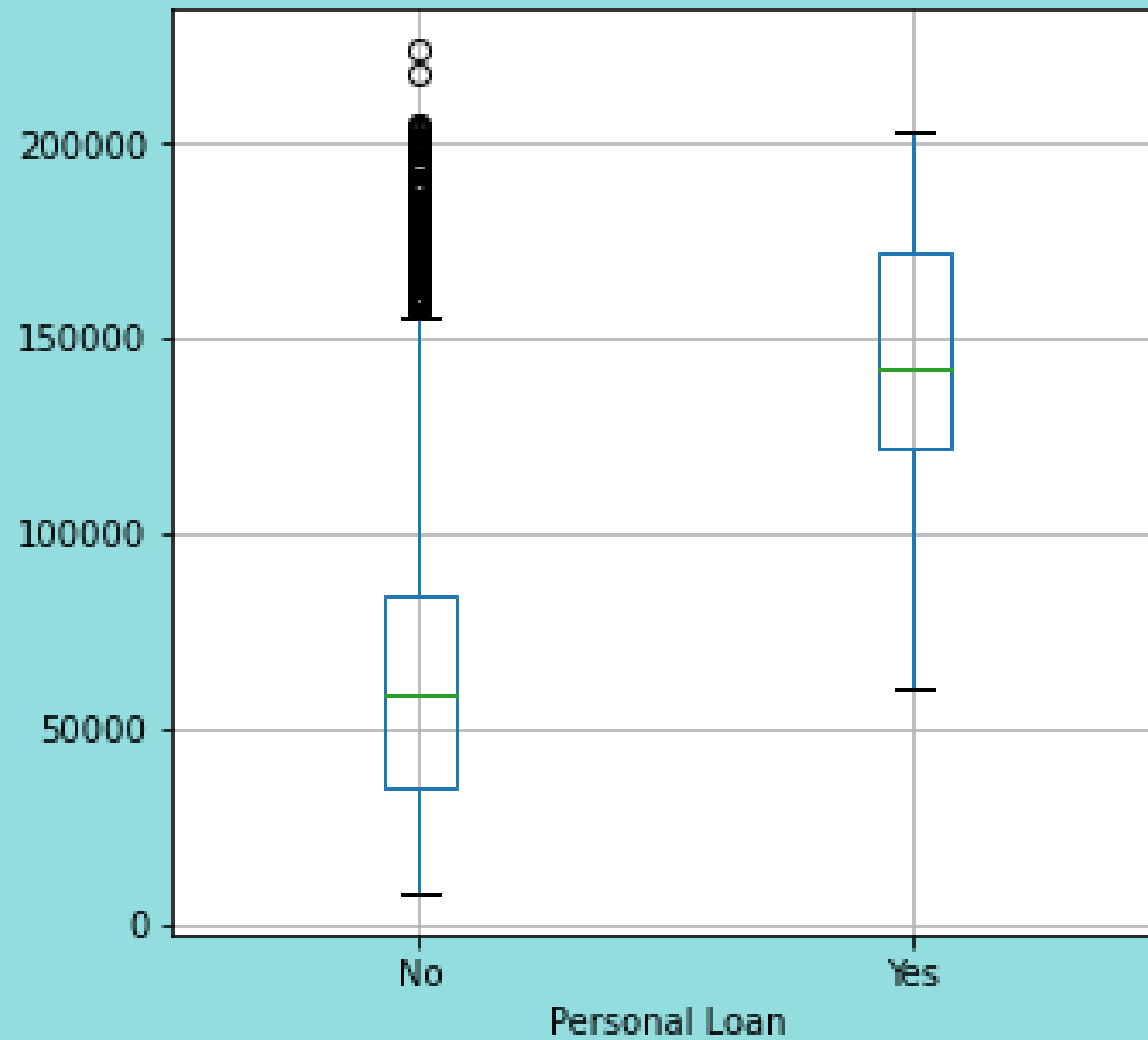


Background Characteristics

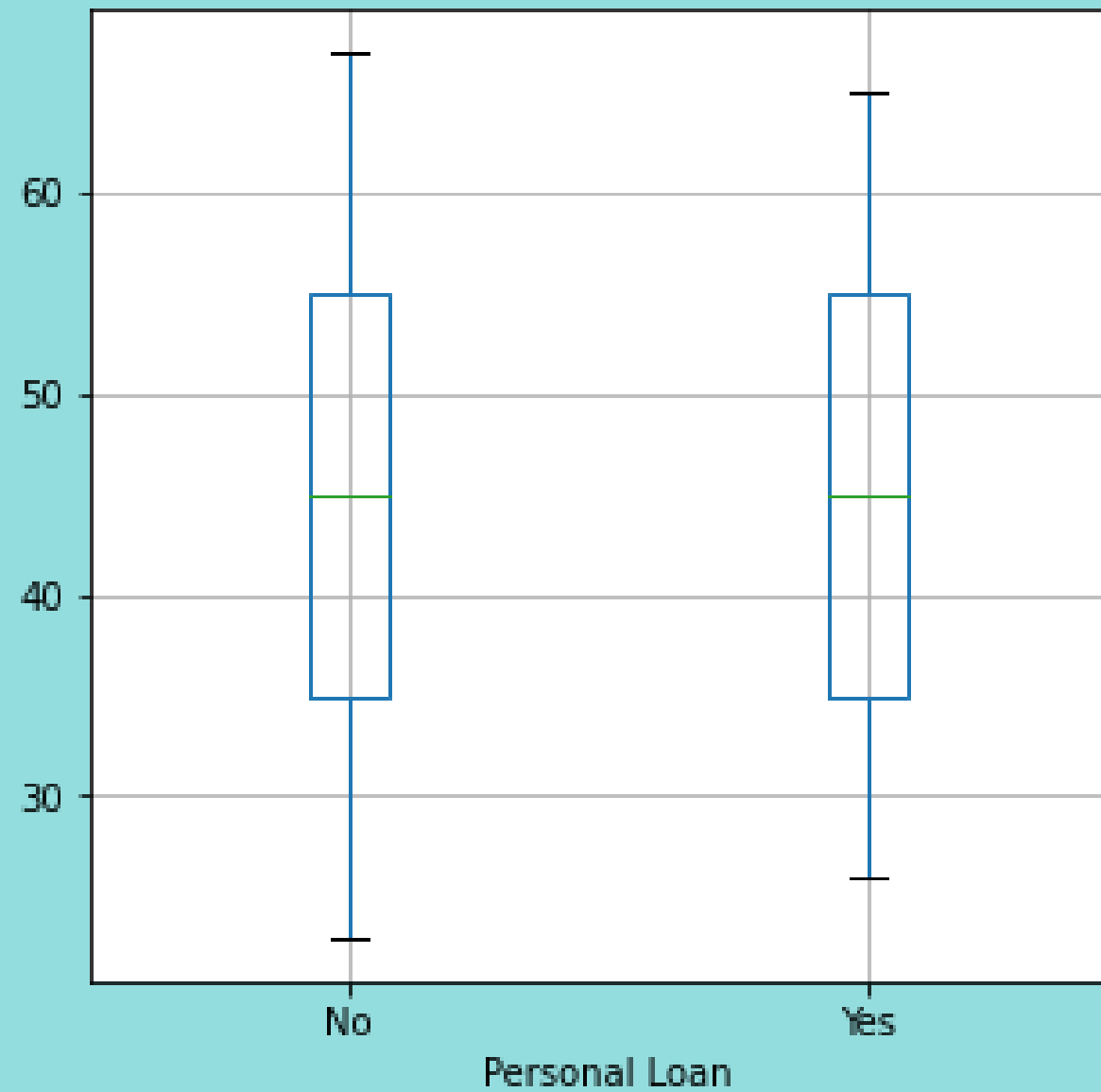
- Age is normally distributed and there is a strong relationship between age and experience.
- The majority are in age 30-35 and 55-60.
- There also exists a strong positive relation between Income and Monthly Credit card spending.



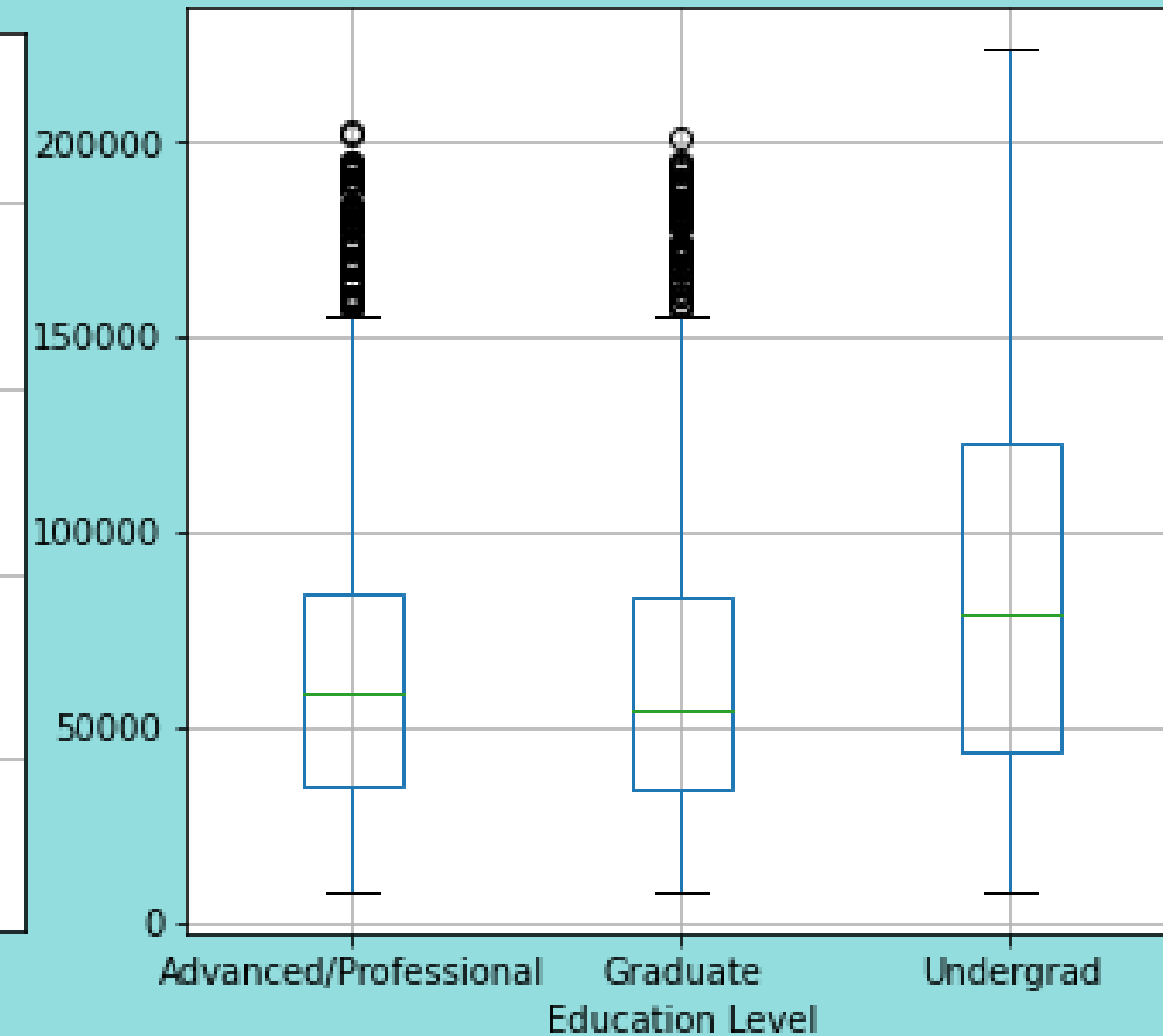
Boxplot grouped by Personal Loan
Income



Boxplot grouped by Personal Loan
Age



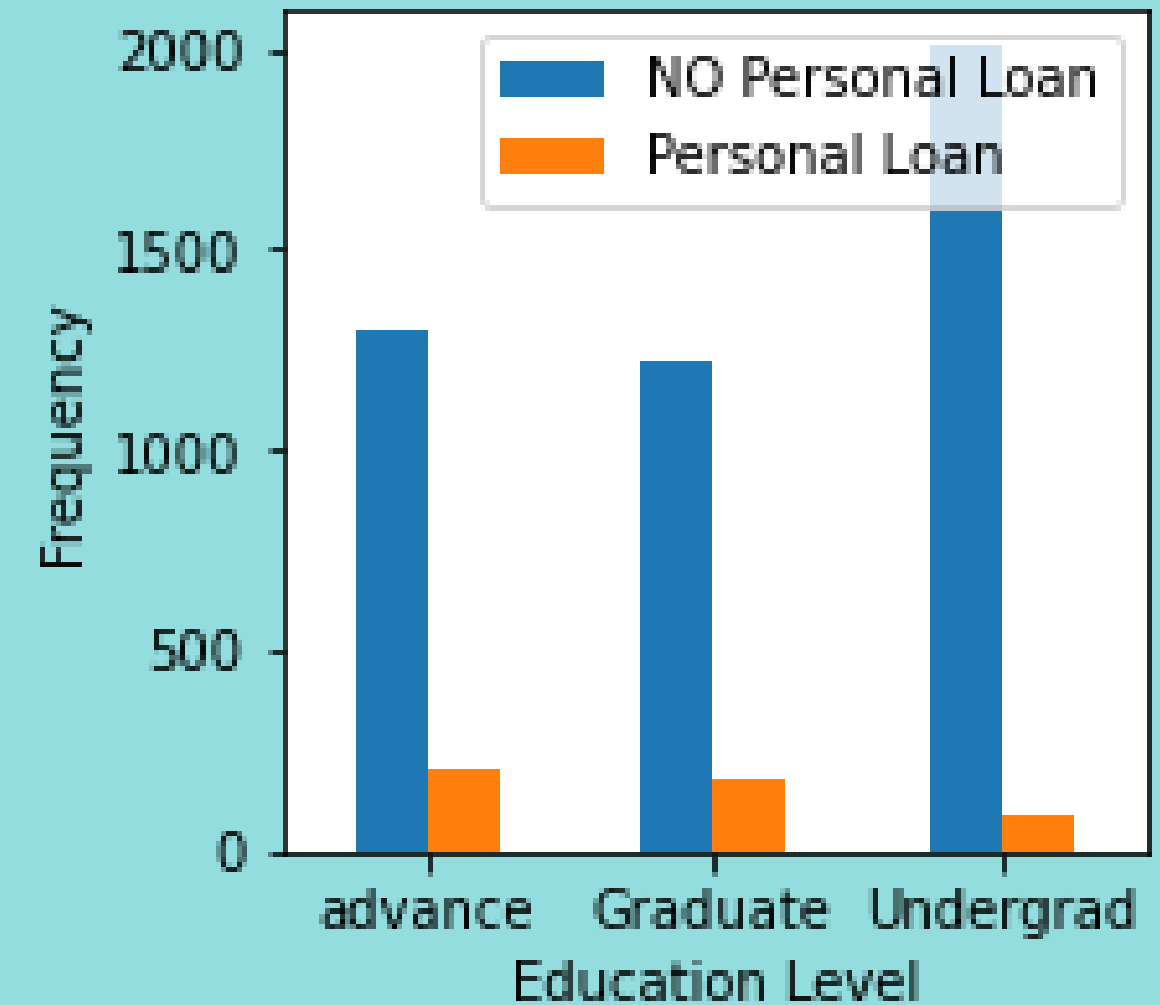
Boxplot grouped by Education Level
Income



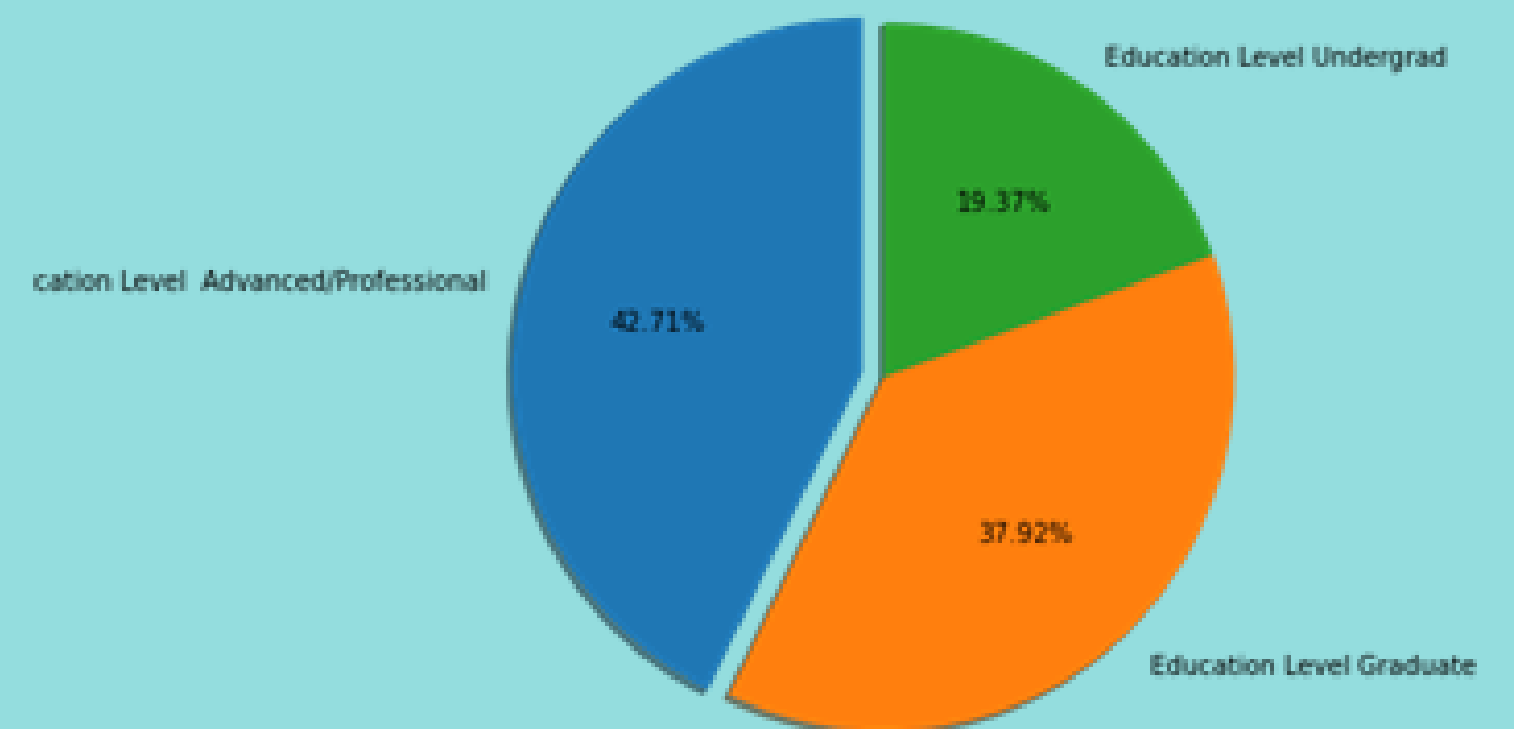
- The first graph is describing the income distribution for those who are taking personal loans and who aren't.
- Age feature is normally distributed and the age of the customers are falling between the range 30 years and 60 years as the median is almost equal.
- There is a variation between education level and income.

Relationship between Education and Personal loan

- 42.7% and 37.9% of customers who takes Personal Loan have education level 3 and 2 respectively.
- For 'Education' characteristic - the main segments to sell Personal Loan is the people who have Second and Third levels of education



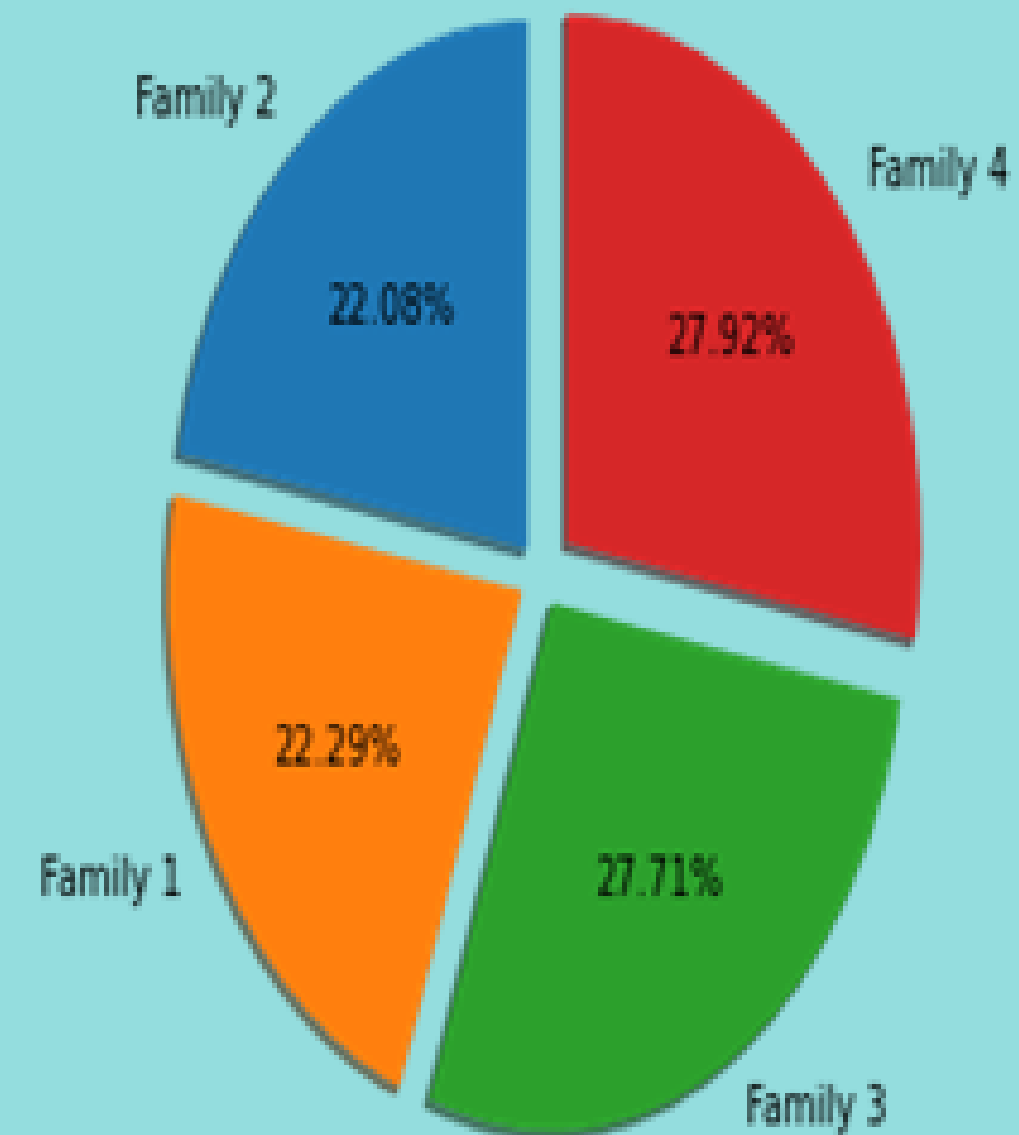
Proportion of Customers With Different Levels of Education vs Personal Loan



Relationship between Family Size and Personal loan

- 27.9% and 27.7% of customers who have Personal Loan, have Family size 4 and Level 3 respectively.
- For 'Family' characteristic - the main segments to sell Personal Loan is the people who have Family Size 3 and 4.

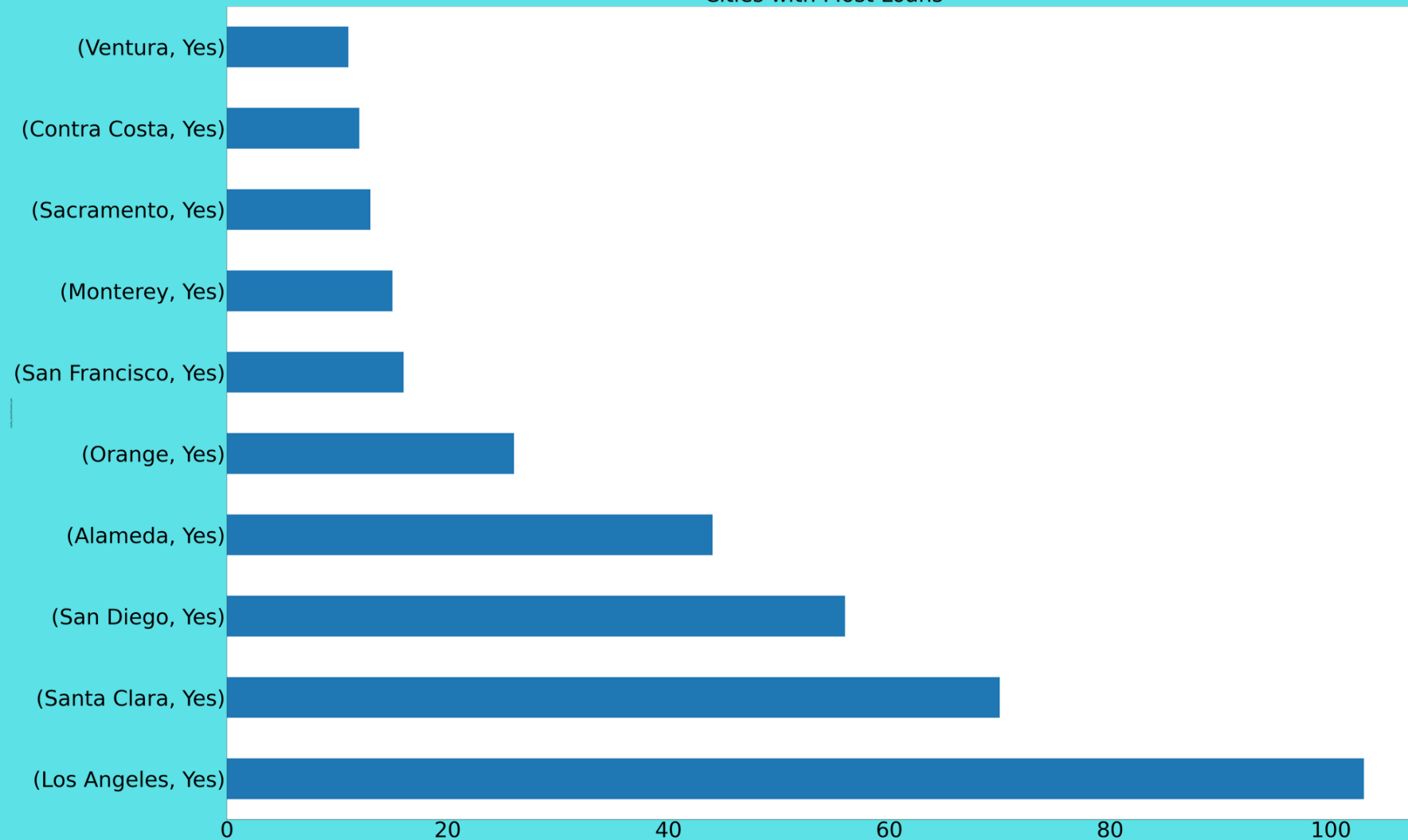
Proportion of Customers With Different Levels of Education vs Personal Loan



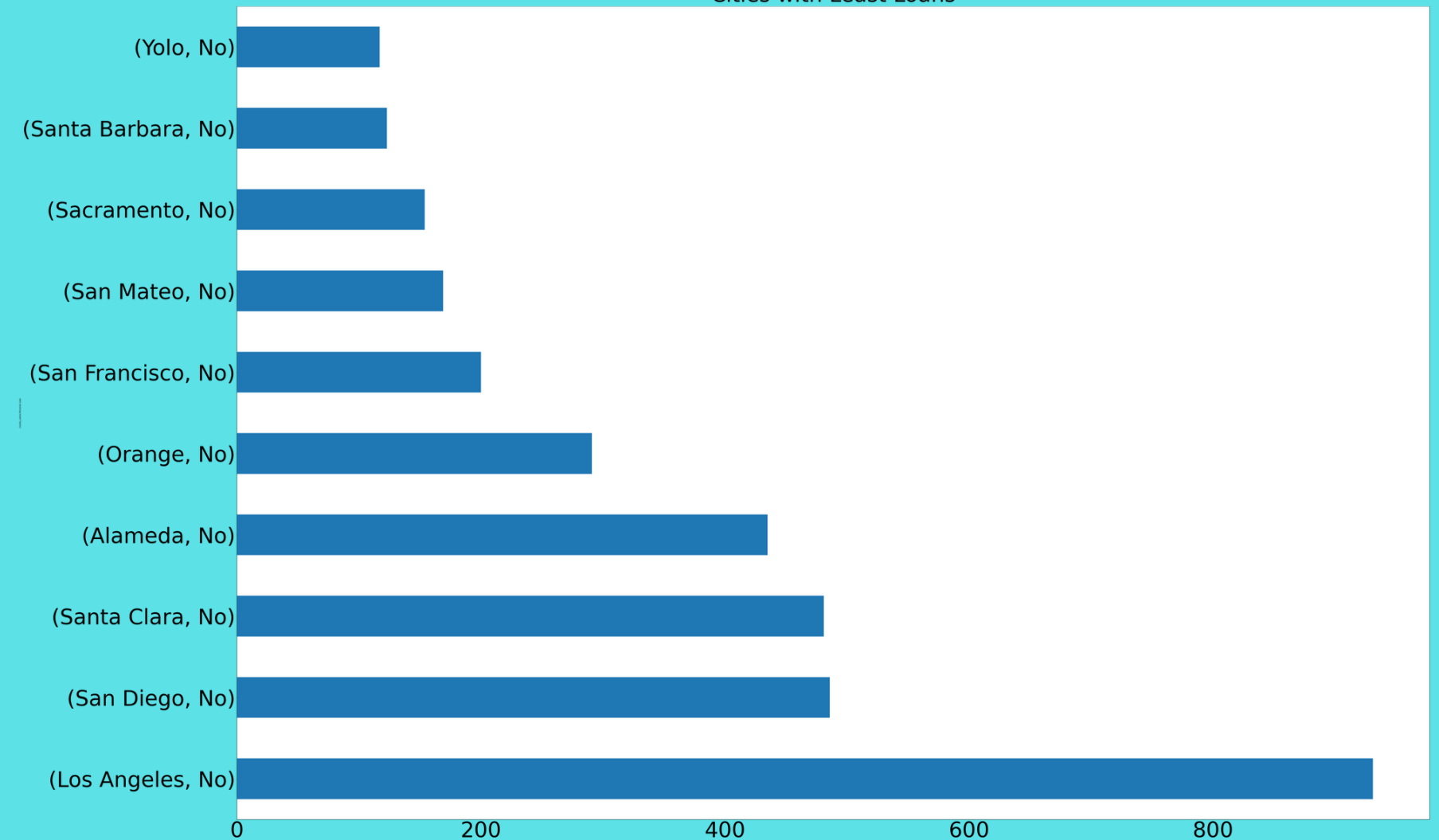
Zip Code/Cities Relationships

No clear relationship between zipcode/city with most accepted and rejected personal loans. The zipcode/city with the most accepted and rejected personal loans is the same, 94720/Los Angeles.

Cities with Most Loans

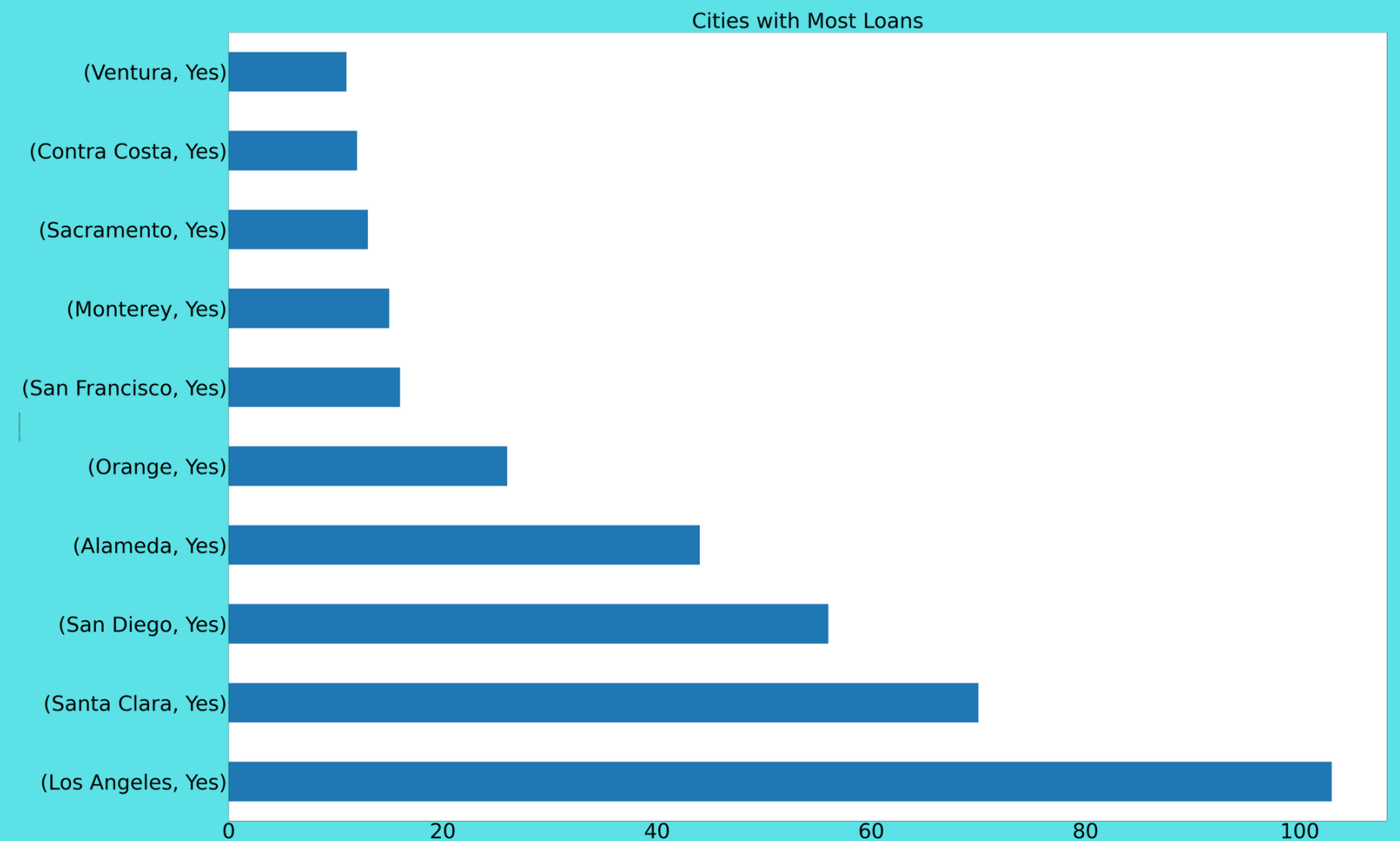
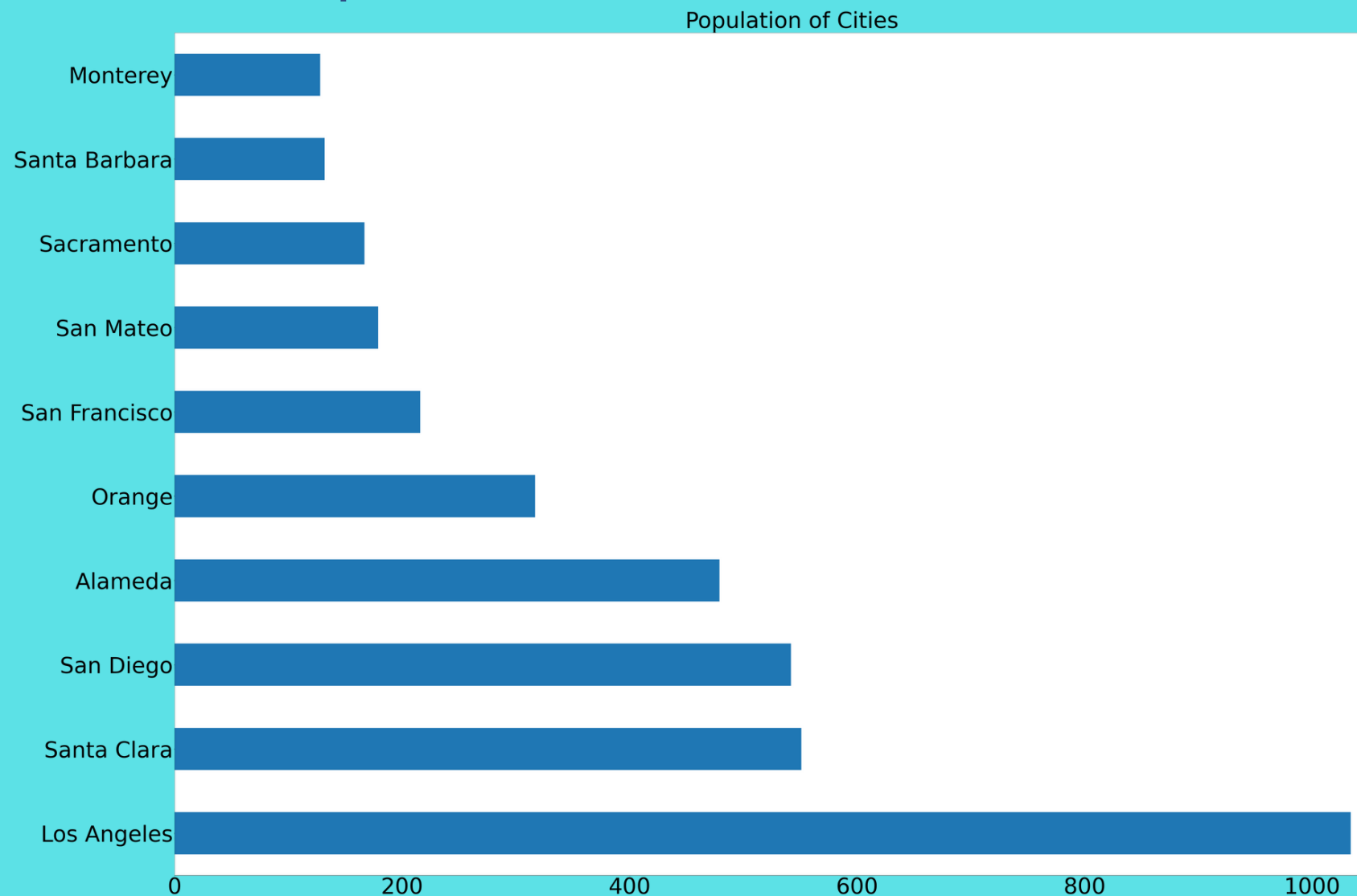


Cities with Least Loans



Zip Code/City Relationships

There is correlation between zip code/city and if a loan was accepted

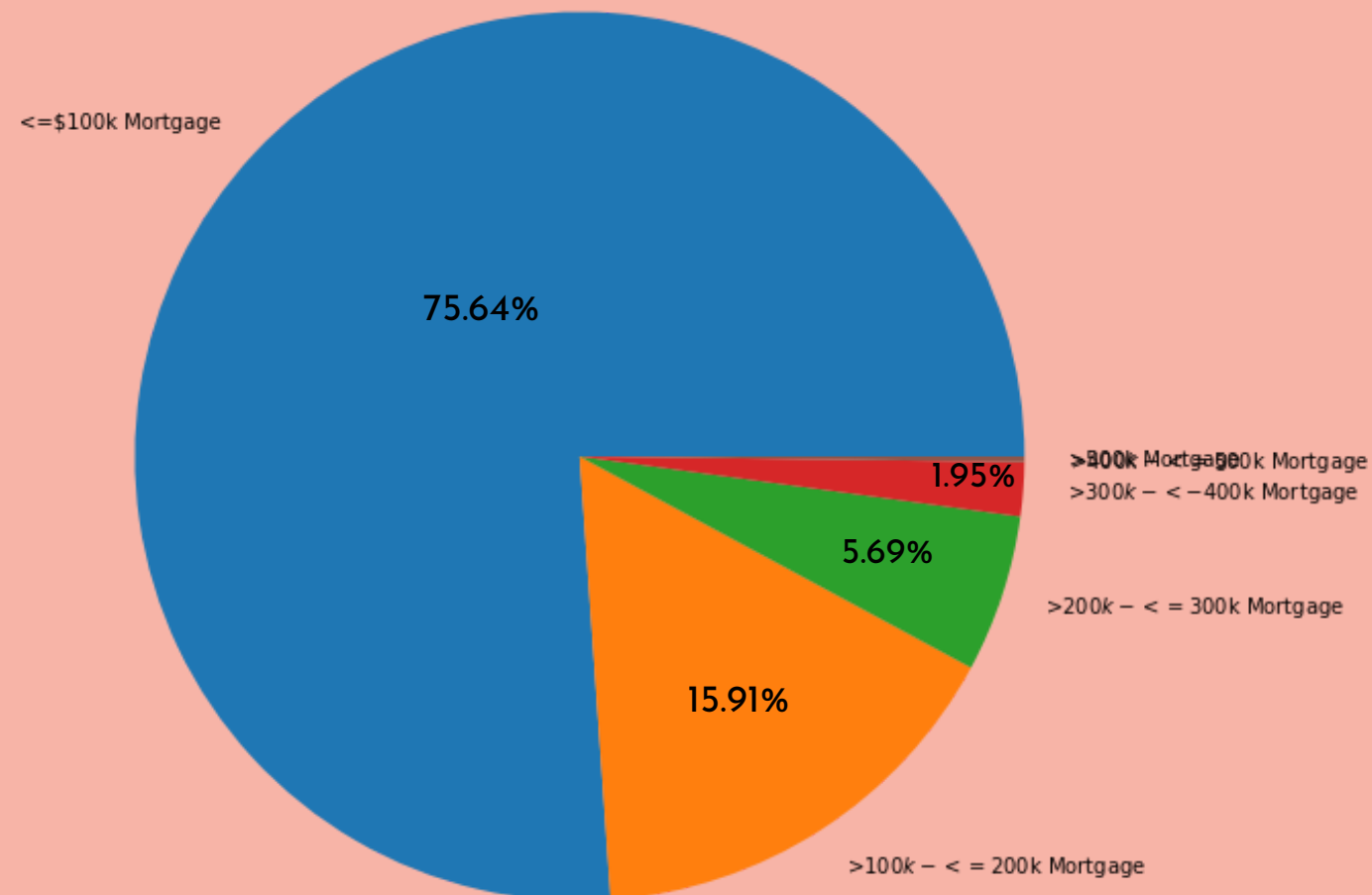


Mortgage Relationship



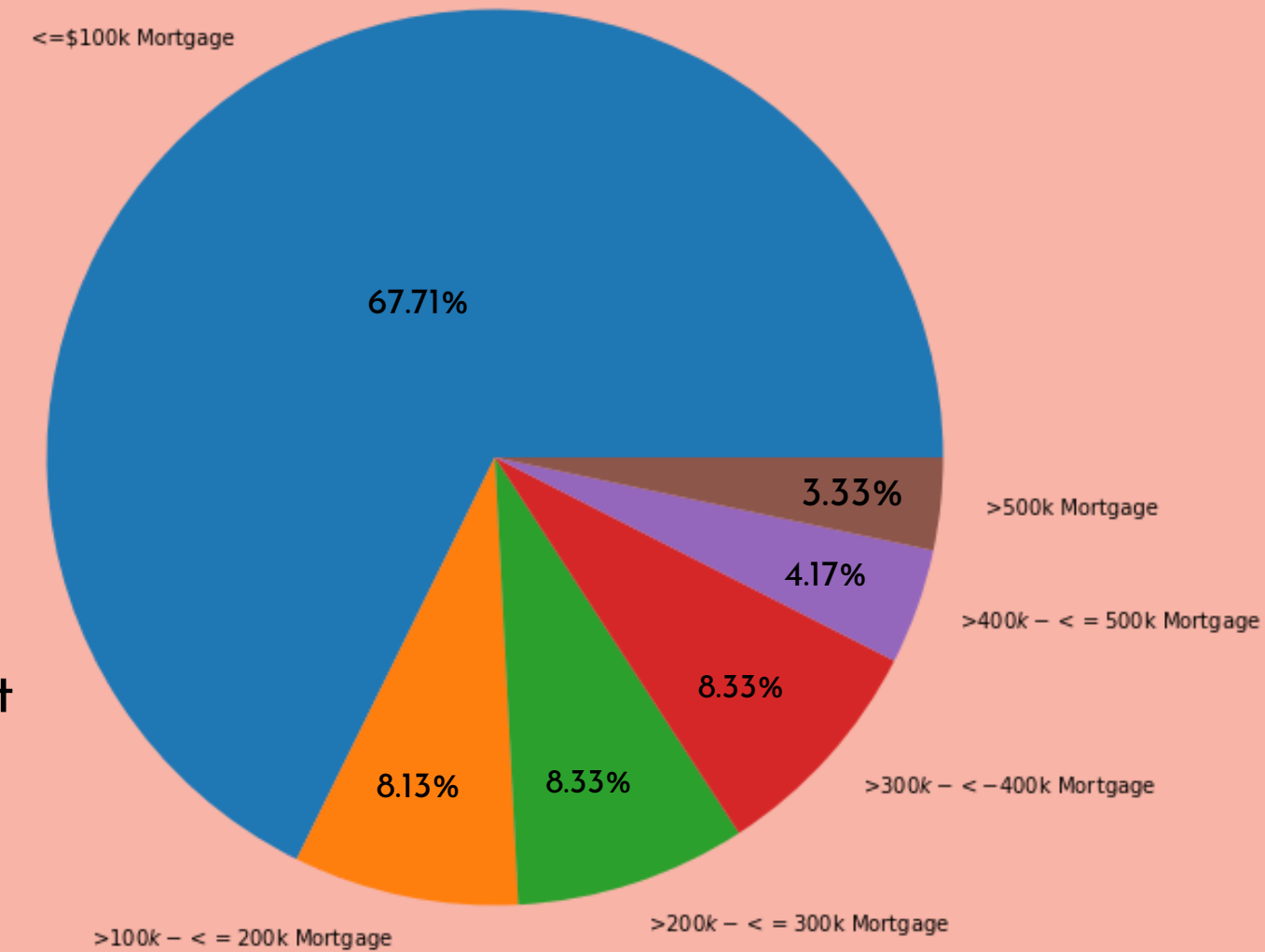
Declined Applications

- Mean Mortgage Value/Amount of Debt is \$100,845.83 for the accepted applications
- Typically the lower amount of debt you have the higher chance you have an accepted loan
- Lowest Mortgage Value is \$0 whereas Highest Mortgage Value is \$617,000 for accepted applications



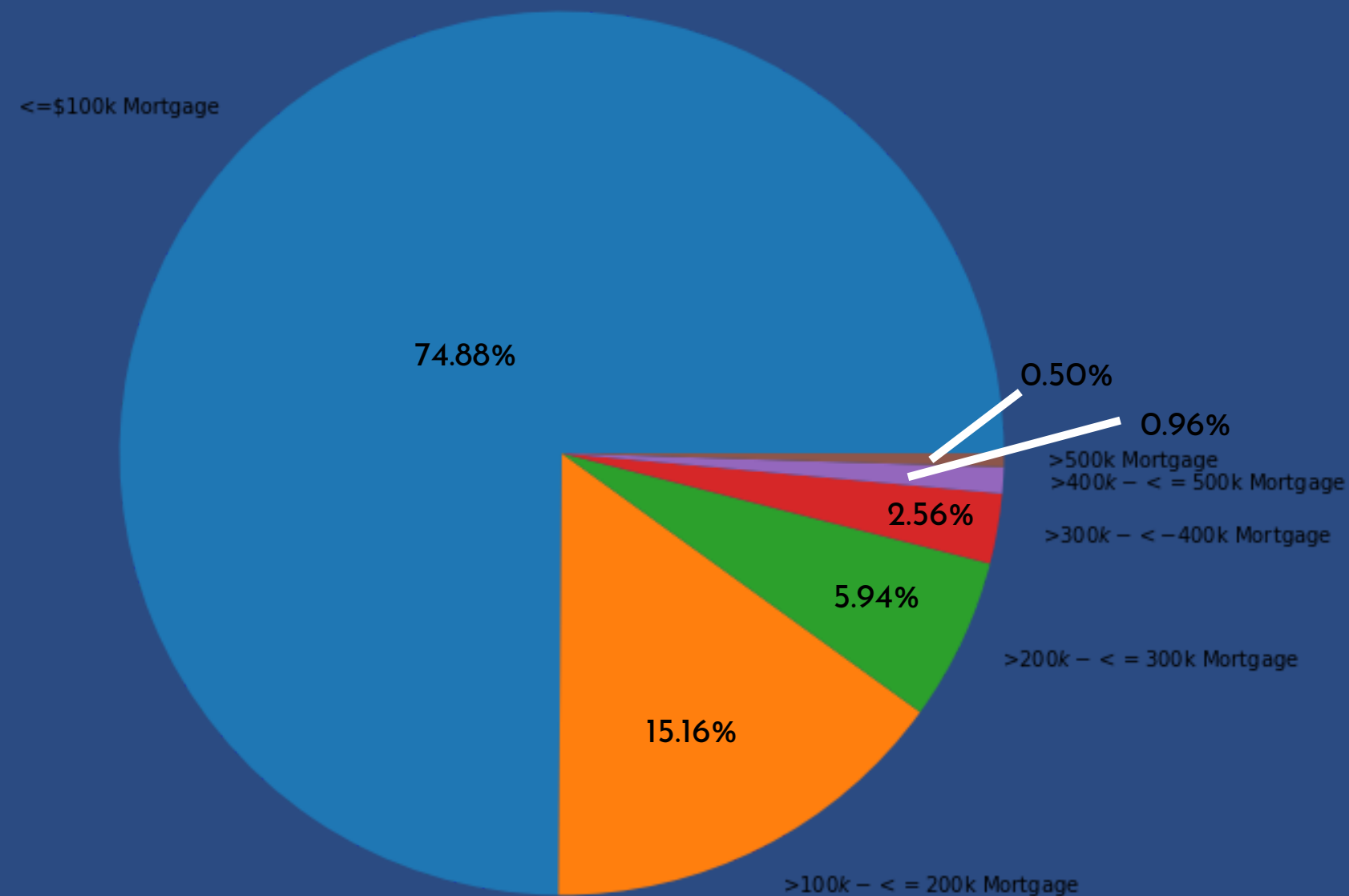
- Mean Mortgage Value/Amount of Debt is \$51,789.38 for declined applications
- Many people with a lower amount of debt (<\$100k) applied for the loan yet they were declined as there are other factors such as income that is taken into consideration
- Lowest Mortgage Value is \$0 whereas Highest Mortgage Value is \$635,000 for declined applications

Accepted Applications

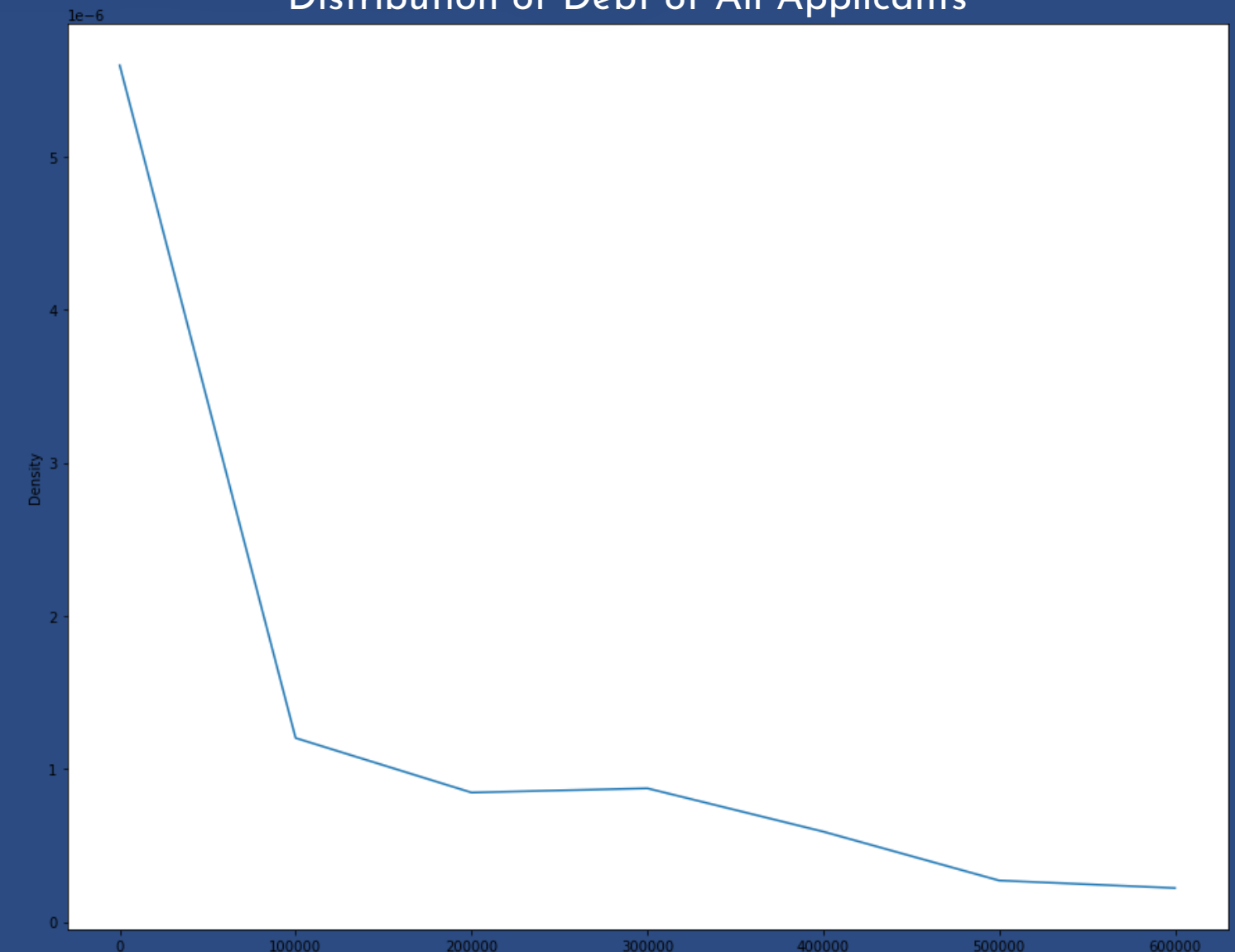


Mortgage Relationship

All Applications



Distribution of Debt of All Applicants



- A majority of people who applied had little to no debt
- The type of distribution closely resembles negative exponential distribution
- Densely populated for people with little to no debt

Conclusion

What are the most
important takeaways?

- Having a high income generally makes an applicant more appealing for a personal loan.
- Having little to no debt generally increases chances of an approved application for a loan
- Students who are pursuing higher education are more likely to take loans.
- Zipcode/city does not play large role in loan acceptance as much as the population in that city/zipcode does