



Student Loan Analysis

Group 17

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Objective

- To comprehensively analyze various factors that affect a student taking a loan such as age, location, race etc and drawing conclusions based on the analysis.
- In particular, some of the questions that we try to answer are:
 - ❖ How does the age of a student relate to the loan they take?
 - ❖ Does the location of a student impact the loan they are taking?
 - ❖ Does the type of school affect the loan amount?
 - ❖ How does race/ethnicity impact the loan amount?
 - ❖ How does the work status of the student post graduation affect the loan amount?
 - ❖ Are borrowers able to repay back their loan?





Data overview

- Our datasets are derived from Federal student aid (An office of US department of education) and Survey of Consumer Finances (collected by the federal reserve system)
- Some of the data is present in xls format while some are present in csv format
- Datasets are split among different groups such as: age, location, debt, etc
- Dataset contains information on borrowers, loan amount and other categories
- Sources:
 - [Federal student aid](#)
 - [Survey of Consumer Finances](#)





Methodology

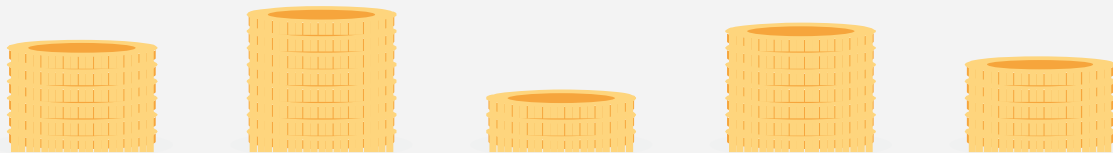
- Data is read into a pandas dataframe, which is then preprocessed and visualized
- Cleaning process involved removing unused rows/columns; correcting inconsistencies, typos, etc; and handling/NaN missing values
- Identify correlations between different categories by utilizing various visualization plots such as bar, pie, line charts etc.
- Analyzing the plots and deriving conclusions



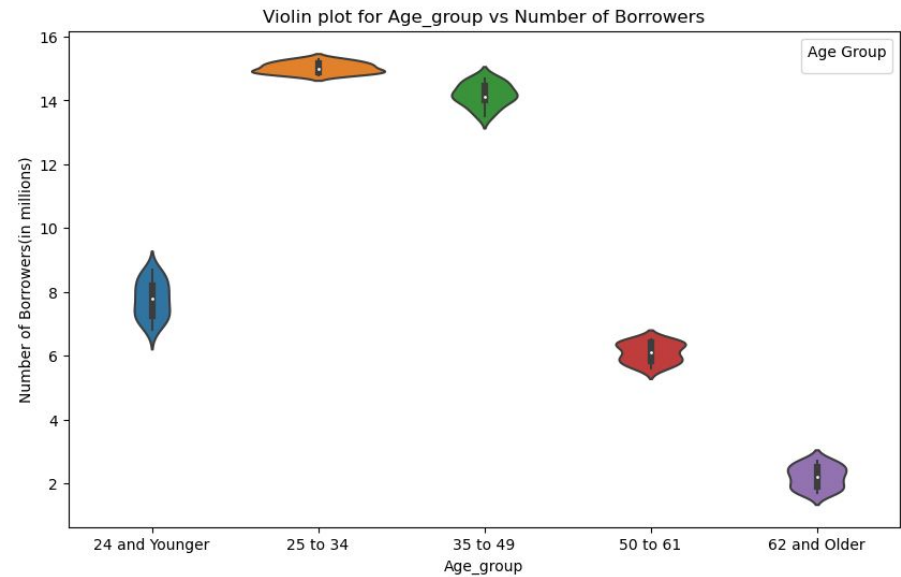
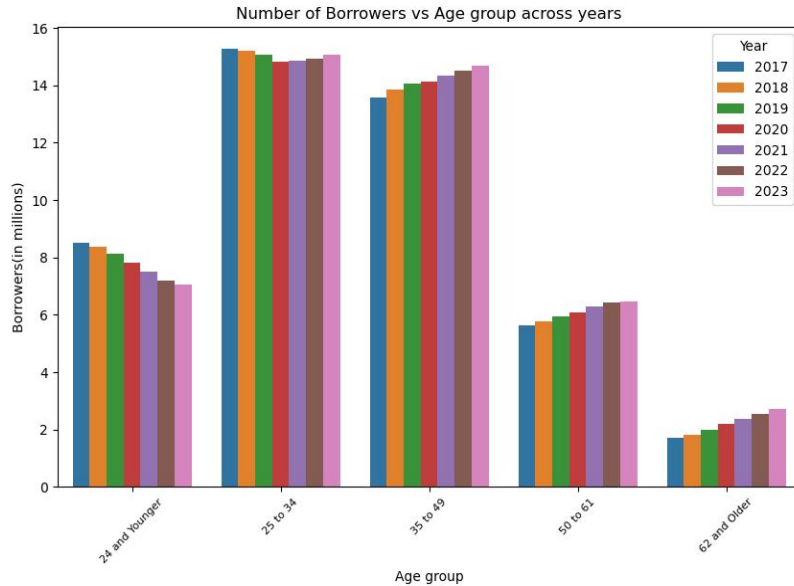


01

Loan vs Age Analysis



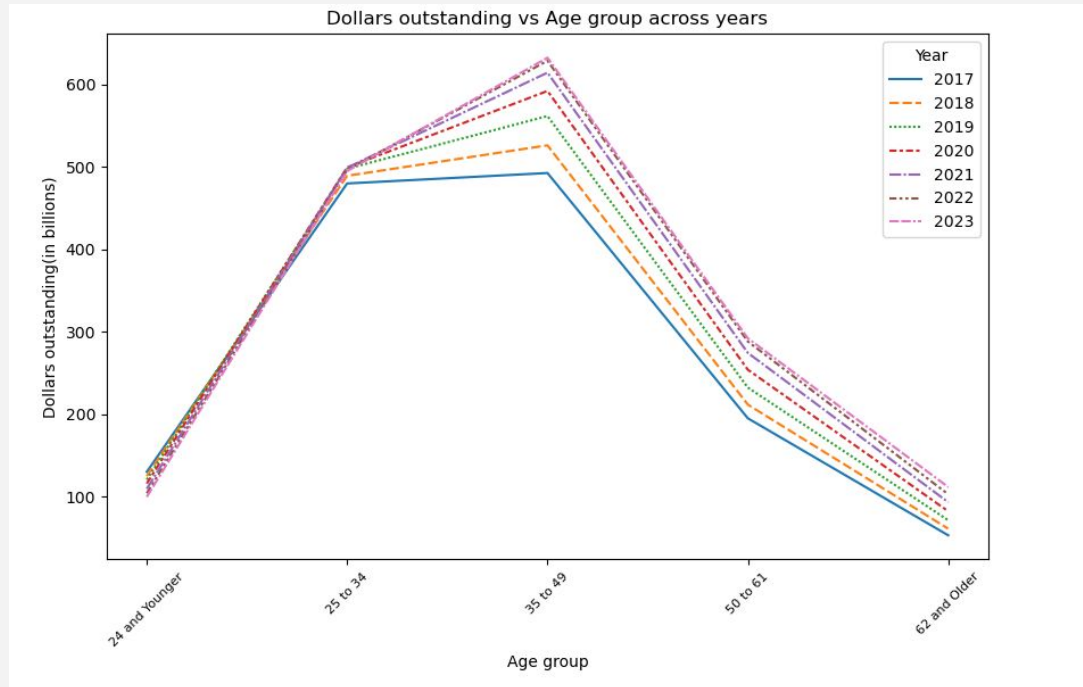
How has the number of borrowers varied across years for different age groups?



- The amount of borrowers are maximum for age group 25 to 34, then decreases as age progresses (trend is observed across years)
- The amount of borrowers are decreasing YoY for 24 and younger age group, decreased till 2020 and then increased for age group 25 to 34 and is increasing YoY for all other age groups



How has the outstanding loan amount varied across years for different age groups?



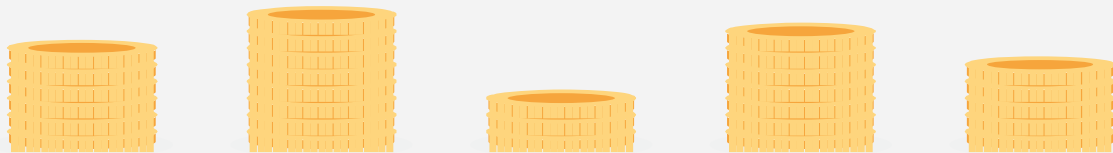
- The loan amount increases till age group 35 to 49, after which it decreases (This trends observed for all years)
- Year-on-Year, the outstanding loan amount is increasing from age group 35 to 49 till the end (This is expected as the number of borrowers are increasing as well, strong correlation between the two)



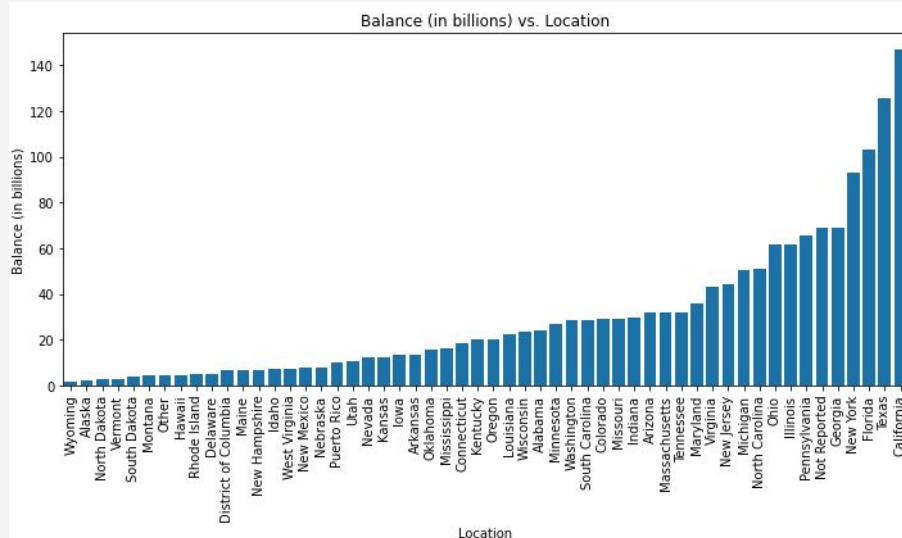
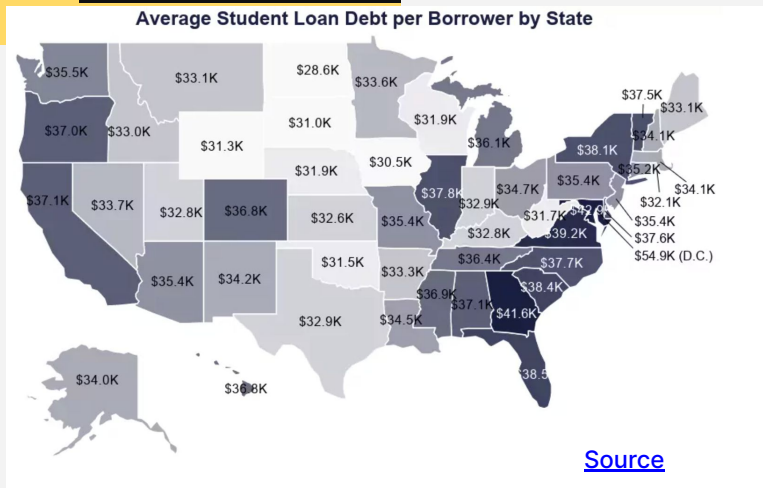


02

Loan vs Location analysis



Balance by State

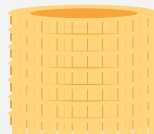
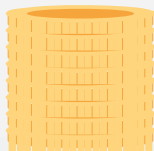


- We find that states in the middle of the country seem to have lower balances on average
- Coast states such as California, New York, Florida have higher balances
- Could be due to these states being technology and industry hubs with reputed educational institutions
- Number of borrowers follow a similar trend

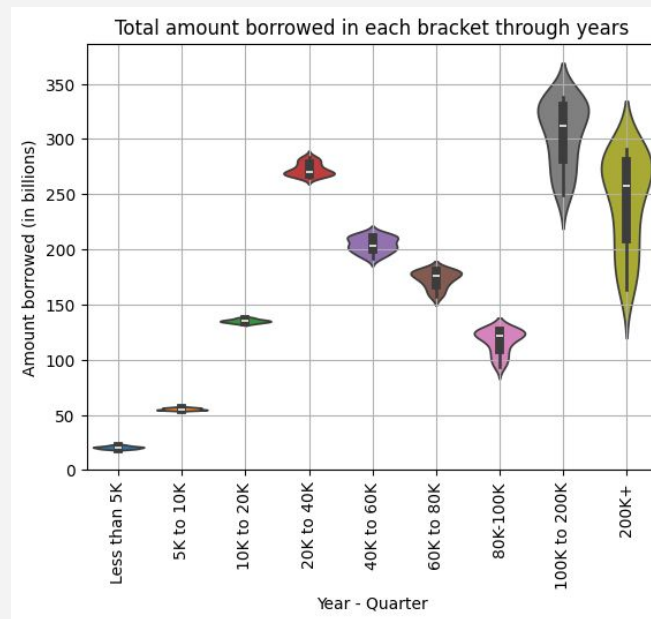
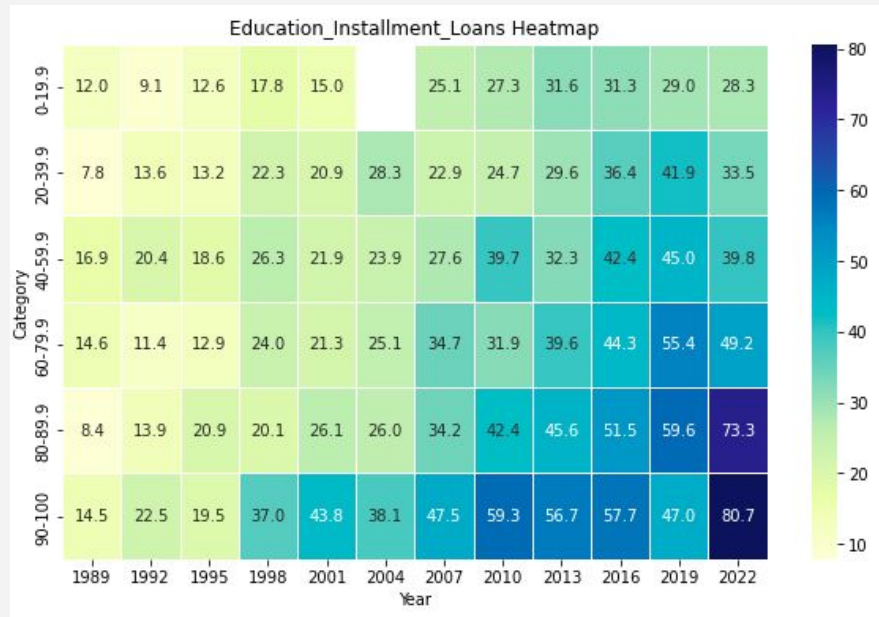


03

Analysis on Debt-size



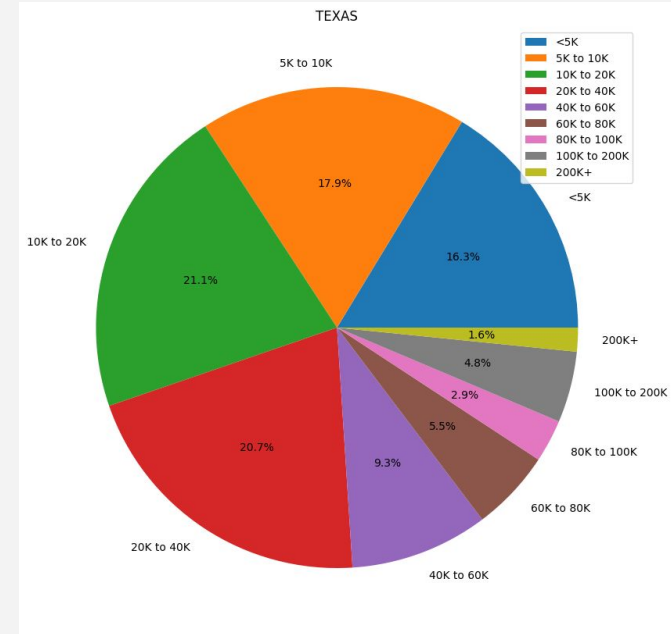
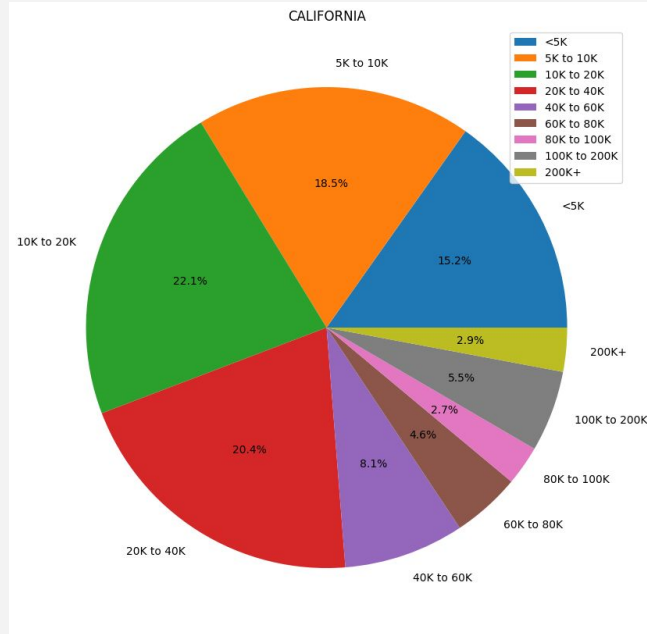
Distributions of amount borrowed throughout the years



- We observe a high variation in the amount borrowed throughout the years in upper debt size brackets, and vice-versa.
- This can be attributed to borrowers with high income, where they are able to borrow more amount as opposed to those who have a lesser income



Distributions of number of borrowers in selected states for different debt sizes



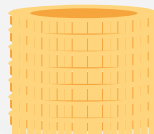
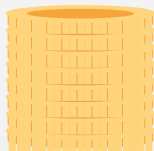
- When looking at the distribution of debt sizes amongst all states in the US, the trend seemed similar as the above charts
- The percentage distribution of debt sizes till 40K is almost uniform, this could be due to various educational institutions present for wide variety of courses and charging fees in these ranges.



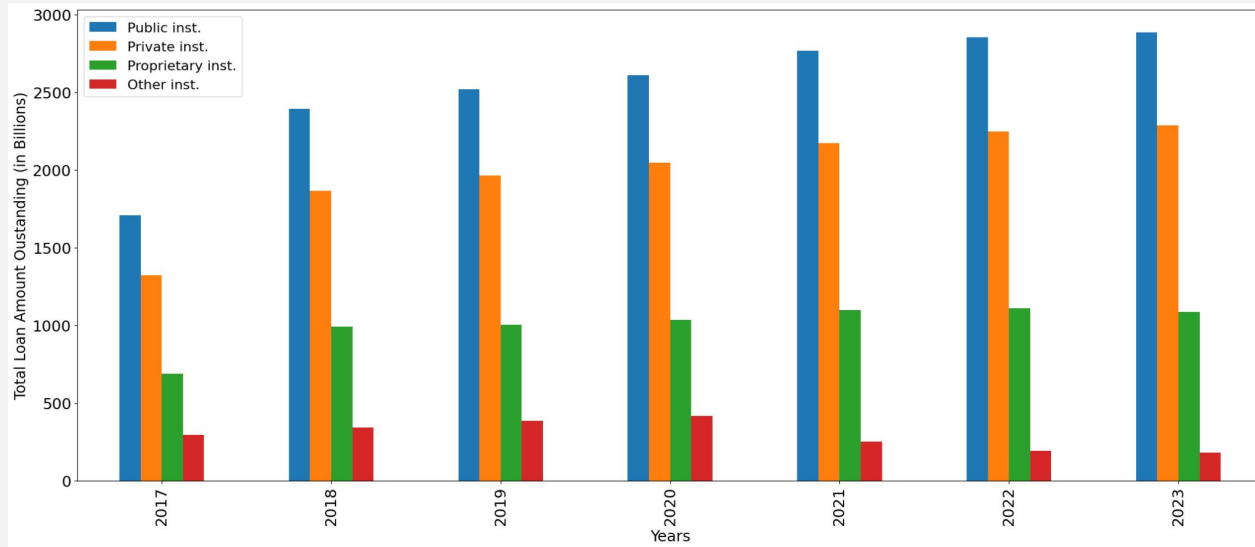


04

School Type



Total student loan debt across years, categorized by type of undergraduate school



- Highest loan amount/number of recipients are for public schools
- 13.49 million enrolled in public college and a further 5.09 million students enrolled in private colleges



Community Colleges



Public Four-Year Colleges



For-Profit Colleges



Private Four-Year Colleges

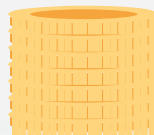
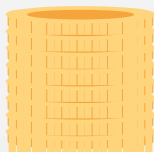
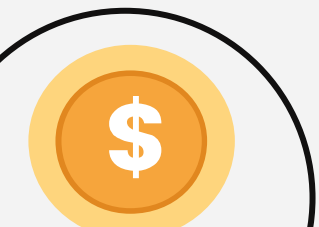
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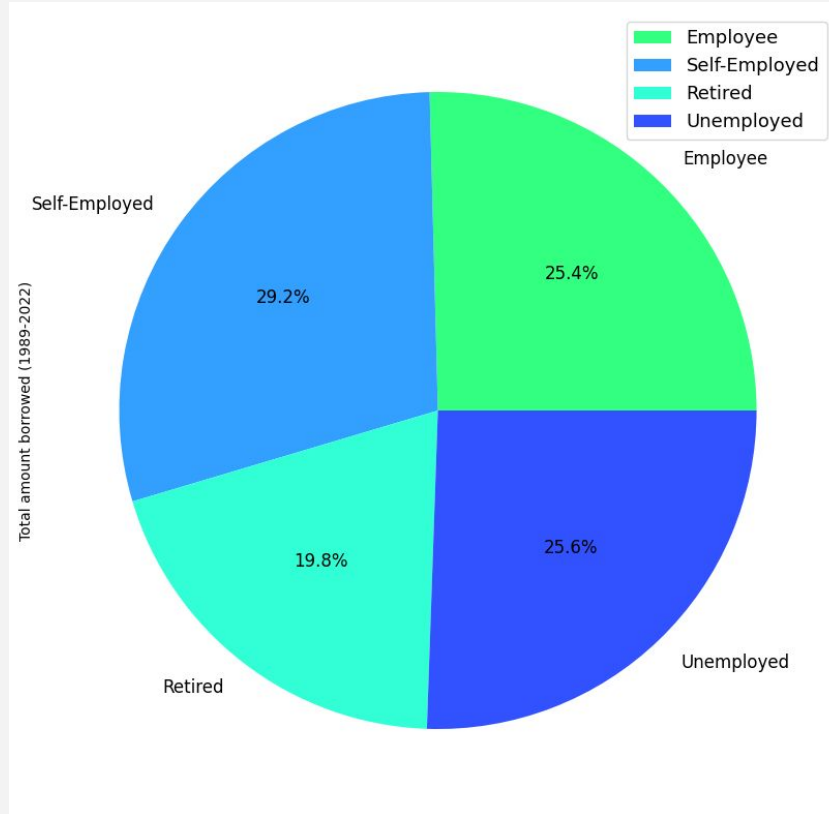
05

Work Status



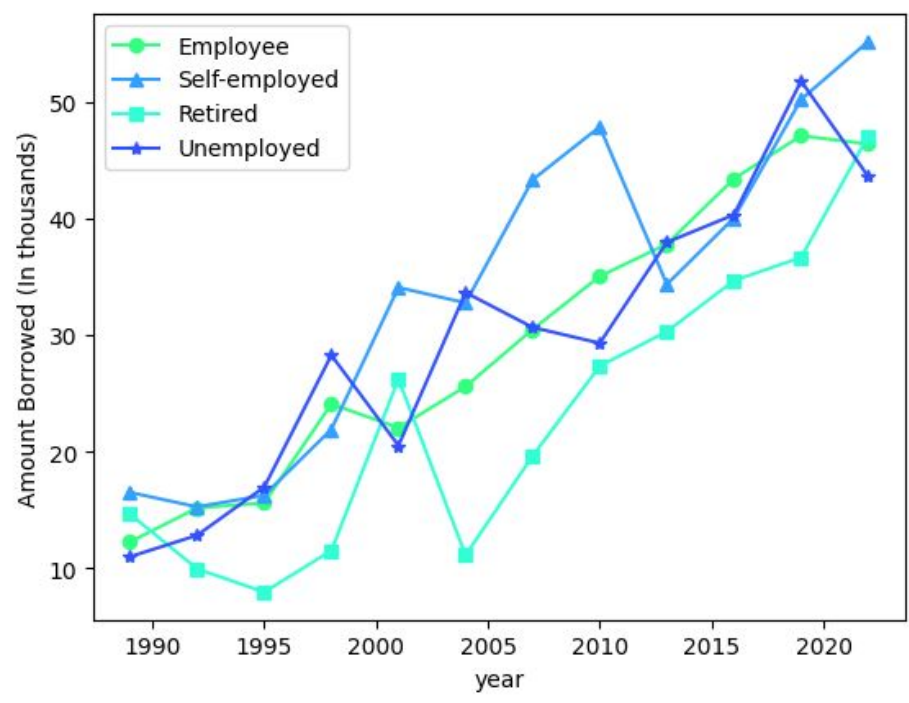
Cumulative loan amount (1989-2022), divided based on work status

- Self-Employed individuals have the highest percentage of loan amount, followed by employees, unemployed and retired.



Trend line of avg. education loan amount across 1989-2022, based on work status

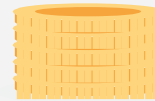
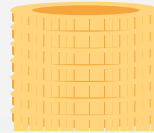
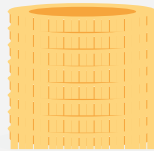
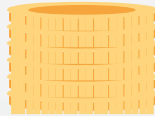
- Irrespective of work status, general trend shows an increase in borrowed amounts over 33 years.
- Some retired people still have student loans (around 3.5 million Americans), and this amount reached an all time high in 2022.





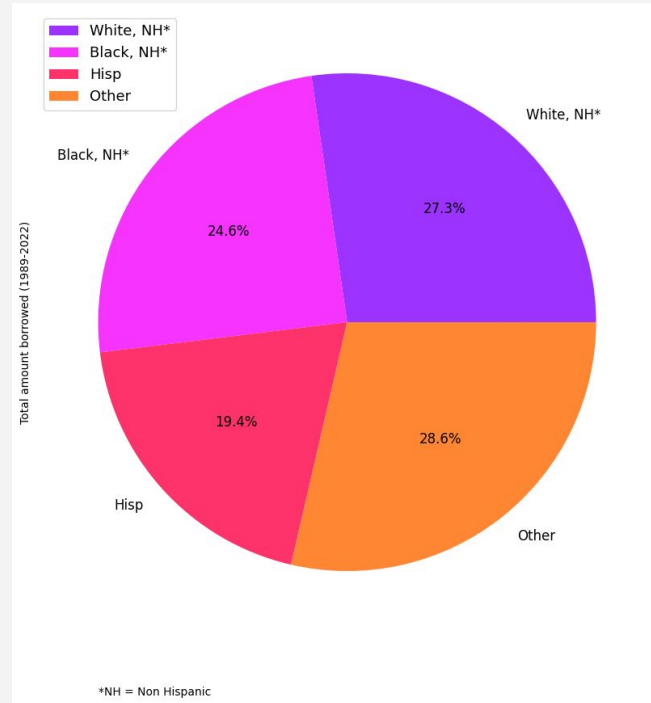
06

Race/Ethnicity

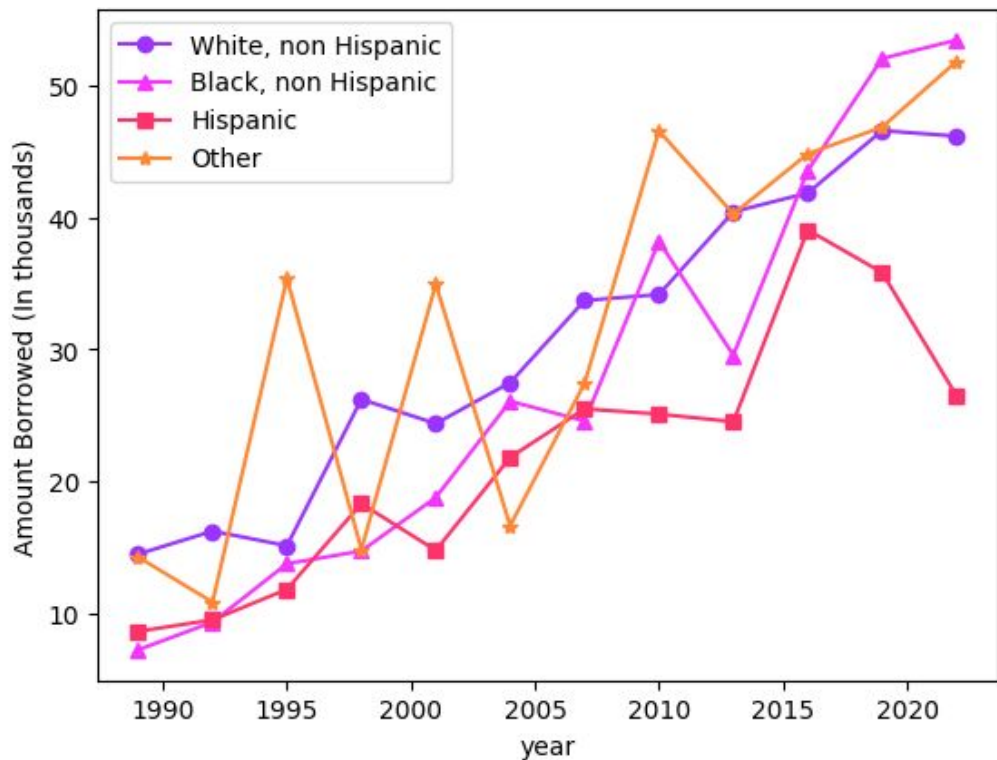


Cumulative loan amount (1989-2022), divided based on race/ethnicity

- Hispanic students (about 19% of the student population) borrow the least.



Trend line of avg. loan amount across 1989-2022, based on race/ethnicity



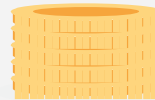
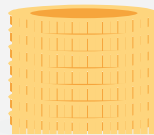
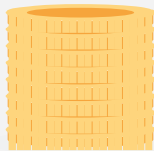
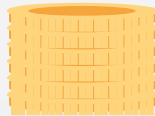
- In recent years, Black non Hispanic students, on average, borrow more than their white/hispanic/asian/native counterparts.



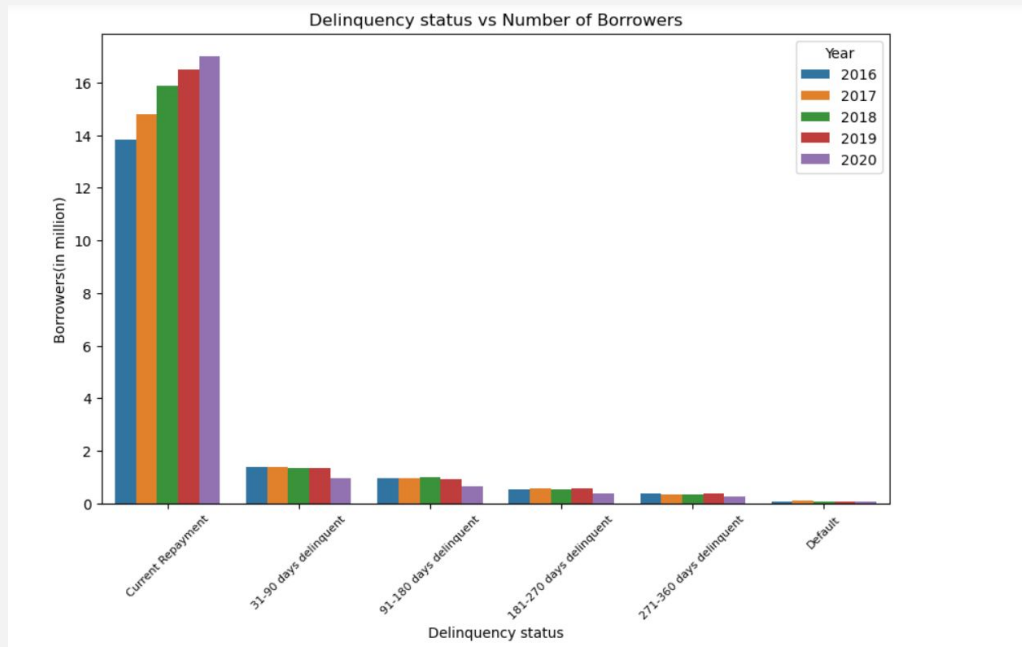


07

Delinquency Status



How has the delinquency status of borrowers varied across years?



- As time progresses, lesser number of borrowers are in delinquent state
- borrowers are able to repay the loan amount they had taken
- More borrowers are present in current repayment state than other groups, further proving the fact that borrowers are able to pay their loan amounts




Conclusion

- YoY, student loans have increased over the last 30 years
- States with the most amount of borrowers and loans are technology and industry hubs, and have a number of reputed institutions for education
- Most loans are present in repayment stage which means that there is a higher financial stress on new graduates
- As time progresses, lesser number of borrowers are in delinquent state, suggesting that borrowers are able to start repaying the loan amount they had taken
- The biggest factors in debt collection was age and income bracket





Thanks !



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