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FEDERAL FAMILY EDUCATION LOAN PROGRAM

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Federal Family Education Loan Program

- This is a student loan program based on a private loan system, subsidized and guaranteed by the U.S. federal government. It was classified into two categories (FFEL SUBSIDIZED and FFEL UNSUBSIDIZED) and two other "subcategories" (Parent PLUS and Grad PLUS). It offered student scholarships to Americans for 45 years until its closure in 2010.
- Identify the loan categories with the highest demand.
- Determine which schools received the largest volume of financial support through loans.
- Analyze the geographic distribution of funds and the disbursement effectiveness rate by state during the year.
- ☐Compare the demand for and distribution of funds among the different types of loans available.
- Measure the degree of relationship between the amount requested and the amount granted, to evaluate consistency or possible gaps.
- Find which schools received the most student loan funding in terms of monetary value.

About this data:

Several websites were consulted for data choice, but the official sites were:

https://catalog.data.gov/dataset/national-student-loan-data-system-722b0

This data segment offers a detailed report on the loans requested and disbursed by each school and state, providing us with the information necessary to answer the goal of this analysis.

Data Cleaning Summary

- The following actions were performed to ensure the quality, consistency, and readiness of the dataset for analysis:
- Missing values were filled with zero (fillna(0)).
- Duplicate records were removed (drop_duplicates()).
- Key text columns (School, State, School Type) were standardized to avoid inconsistencies.
- Numeric and monetary columns were cleaned and converted to float type, removing invalid symbols and values.
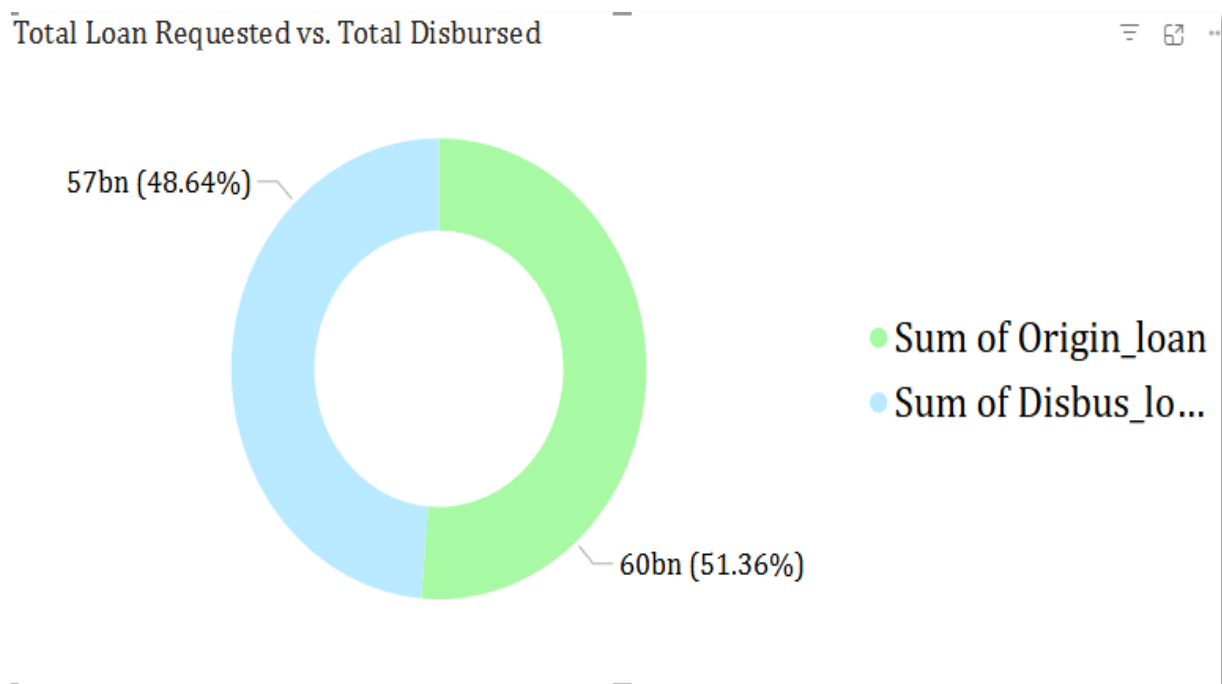- Garbage rows with repeated headers or text in numeric columns were removed.

Analysis

Visualization of Loan Applications and Disbursements

This analysis compares two important aspects of the student loan process:

1. **The total number of loan applications** (how many loans were requested).
2. **The total number of disbursements** (how many loans were actually granted).

To ease understanding of this comparison, a graphing tool called Matplotlib was used, which allows for the creation of clear and easy-to-interpret visualizations.

Total Loan Requested vs. Total Disbursed

57bn (48.64%)

60bn (51.36%)

- Sum of Origin_loan
- Sum of Disbus_lo...

As shown in the chart, the **number of loans disbursed actually exceeded the number of loan requests**. This may show that more loan disbursements were made beyond initial applications—possibly due to adjustments, automatic awards, or batch processing by institutions.

Understanding this difference helps stakeholders assess the responsiveness and behavior of the financial aid system and may point to opportunities for improving transparency or efficiency in the loan approval process.

Loan Requests vs Disbursements per Category
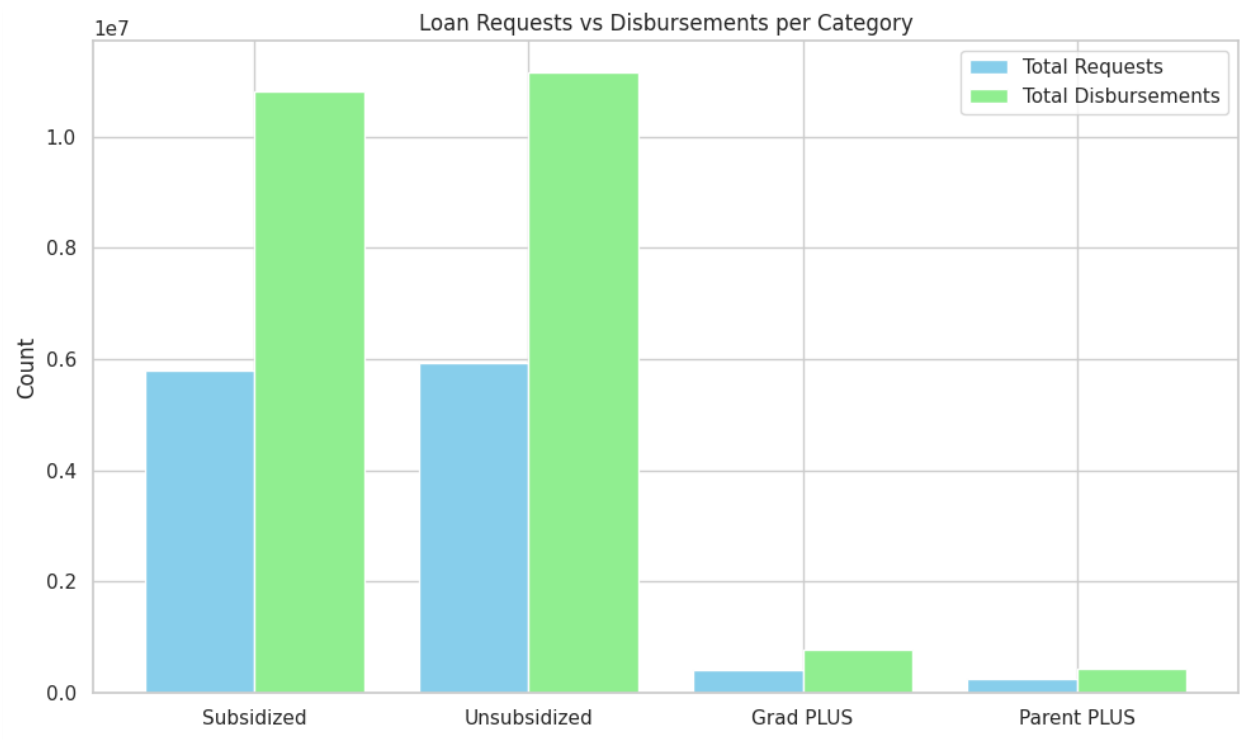
Loan Category with the Highest Demand

Contrary to first expectations, the **Unsubsidized loan category** had the **highest number of applications**, totaling **$5,933,186** during the 2009–2010 academic period.

Federal Family Education Loan Program 2009-2010

Top 20 Schools with the most request and Disbursements

School	Total Loans Originated	Total Disbursements	Loan Category
UNIVERSITY OF PHOENIX	351720.00	596035.00	Subsidized
UNIVERSITY OF PHOENIX	336088.00	588392.00	Unsubsidized
DEVRY UNIVERSITY	123989.00	175459.00	Unsubsidized
DEVRY UNIVERSITY	113146.00	160022.00	Subsidized
ITT TECHNICAL INSTITUTE	89618.00	220603.00	Subsidized
ITT TECHNICAL INSTITUTE	84540.00	213259.00	Unsubsidized
KAPLAN UNIVERSITY	79361.00	195198.00	Unsubsidized
KAPLAN UNIVERSITY	62955.00	154885.00	Subsidized
ASHFORD UNIVERSITY	61988.00	106659.00	Unsubsidized
STRAYER UNIVERSITY	52755.00	126420.00	Unsubsidized
NOVA SOUTHEASTERN UNIVERSITY	51522.00	51579.00	Subsidized
ASHFORD UNIVERSITY	51361.00	85530.00	Subsidized
NOVA SOUTHEASTERN UNIVERSITY	49715.00	49785.00	Unsubsidized
STRAYER UNIVERSITY	49235.00	117919.00	Subsidized
EVEREST UNIVERSITY	47326.00	108795.00	Unsubsidized
BAKER COLLEGE	44678.00	74071.00	Subsidized
EVEREST COLLEGE	43484.00	85540.00	Unsubsidized
COLORADO TECHNICAL UNIVERSITY	41588.00	93175.00	Subsidized
COLORADO TECHNICAL UNIVERSITY	41067.00	92691.00	Unsubsidized
HEALD COLLEGE	39488	94490	Unsubsidized

## Heatmap: Relationship Between Loan Requests and Disbursements

The heatmap below illustrates the relationship between the **total amount of loans requested** and the **total amount actually disbursed**.

In this case, we observe a **strong positive correlation**, meaning that as the amount of requested loans increases, the amount disbursed also tends to increase. This is visualized by a **deep-colored (usually red or dark blue)** square in the chart, indicating an elevated level of alignment between the two variables.
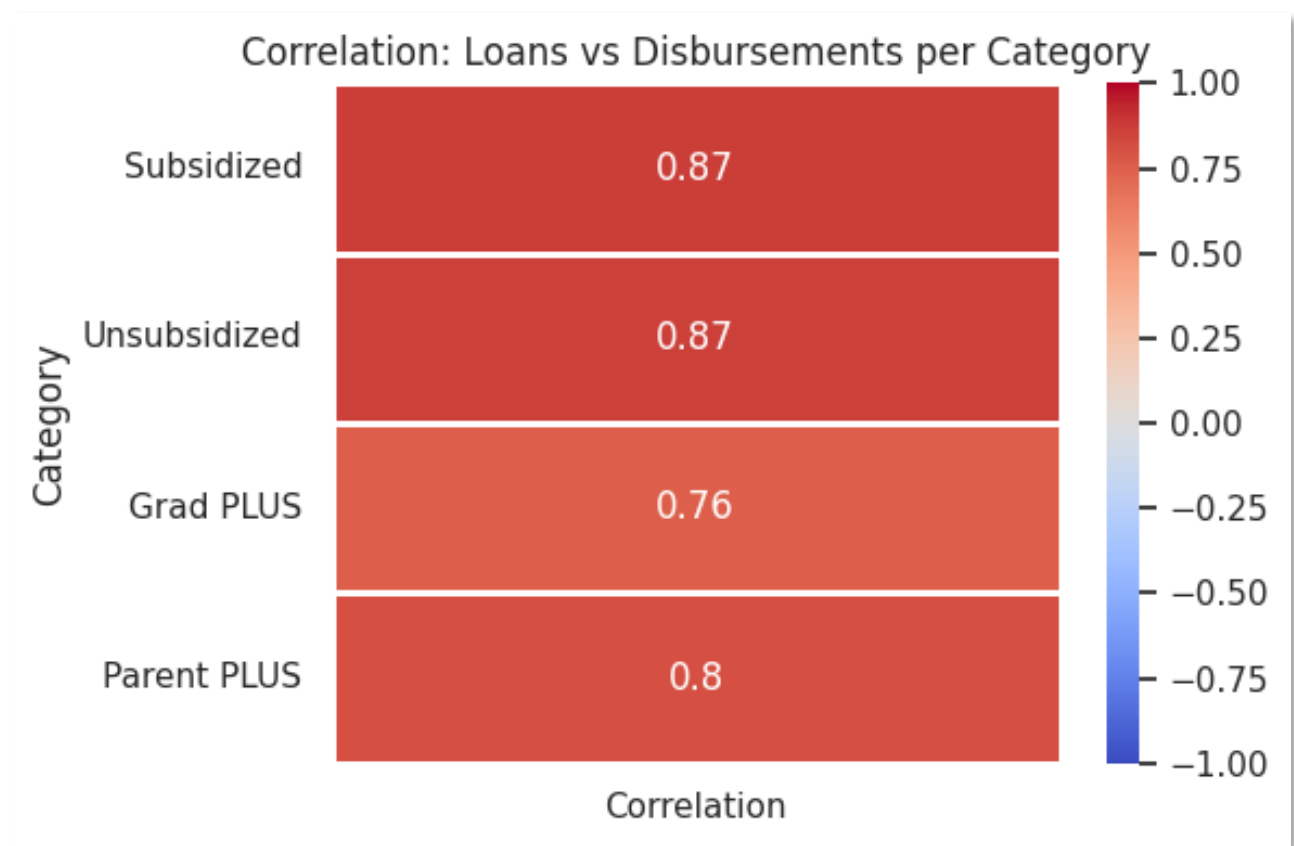
This strong correlation suggests that, overall, the loan system is **efficient and consistent** in meeting student demand. It indicates that most of the requested financial support is being fulfilled through actual disbursements—an encouraging sign for students and educational institutions alike.

Histogram: Loan Amounts Disbursed by State

Total Disbursements loans per States
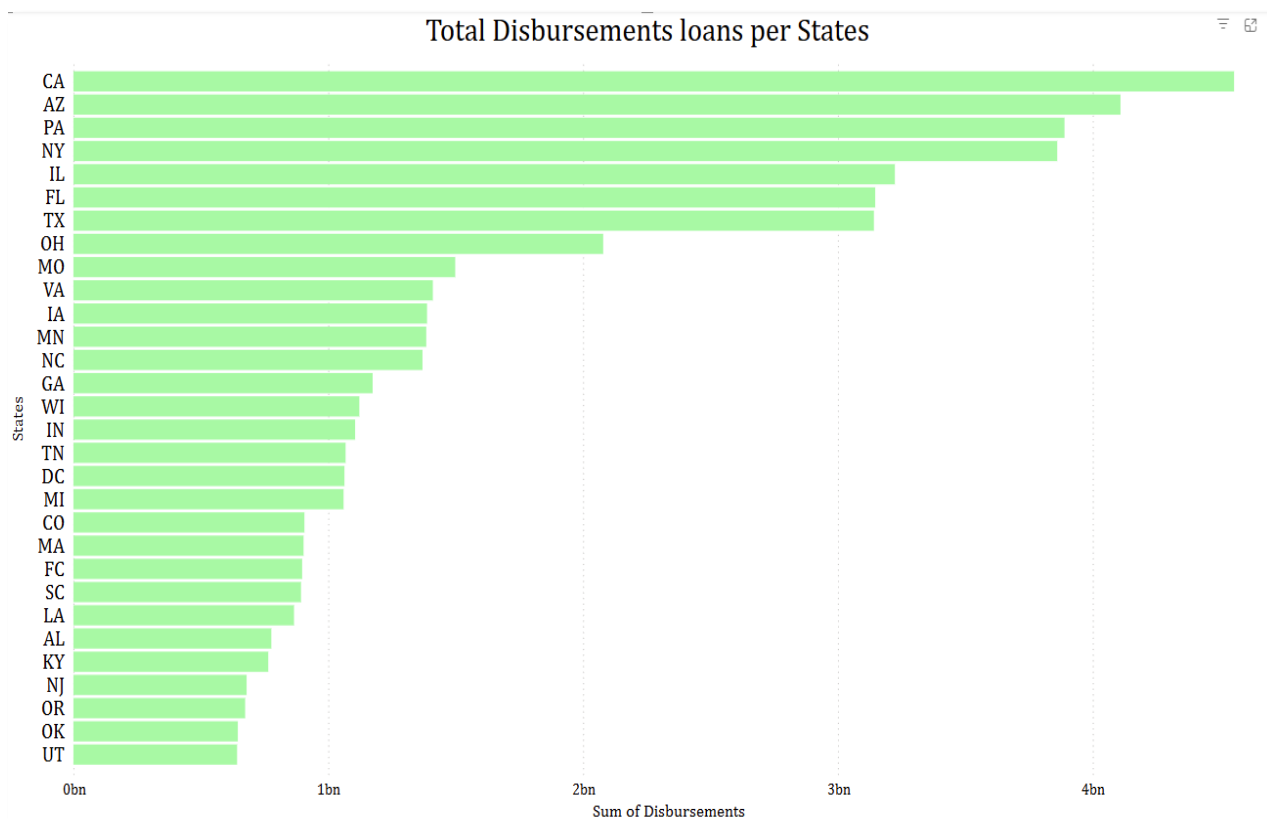
This histogram illustrates the **total loan amounts disbursed** by state during the **2009–2010 academic year**. Each bar stands for a state, showing how much funding was successfully delivered to students through approved loans.

Notably, the states of **California (CA)**, **Arizona (AZ)**, and **Pennsylvania (PA)** stand out as the **top three** with the **highest total loan disbursements**. This reflects both a high volume of applications and a strong level of financial aid distribution in those states.

The results suggest that these states had either:

- A **larger student population**,

- Greater access to federal or institutional loan programs, or

- Higher education costs leading to larger average loans.

This kind of state-by-state analysis help us to finding regions with the highest financial aid needs and evaluating how effectively funding is being distributed across the country.

Conclusion

During the 2009–2010 academic year, key trends in student loan use were identified:

The most requested and disbursed loan category was unsubsidized loans, highlighting their high demand among students.

A strong correlation was seen between the total loan amounts requested and those disbursed, indicating high efficiency in the approval and disbursement of funds.

At the state level, California, Arizona, and Pennsylvania led in loan amounts disbursed, suggesting a combination of high demand and access to educational financing.

Institutions with the highest disbursements tend to be in these states, possibly reflecting larger student populations or higher educational costs.

This analysis offers a clear view of how student loan funds are distributed, allowing for more effective institutional decisions, public policies, and financial support strategies.

Tools Used:

- **Excel:** Initial data preparation and review.

- **Python:** Data cleaning, analysis, and generation of key visualizations.

- **Power BI:** Category grouping and creation of interactive visualizations.

- **ChatGPT:** Support for grammar refinement and optimization of code snippets