

Economic Outcomes of U.S. College Majors

Sagnik Bhattacharya

December 29, 2025

Executive Summary

This project presents an end-to-end data analysis of the economic outcomes associated with U.S. college majors. Using Python for data cleaning and feature engineering, SQL for analytical querying, and Excel for interactive dashboard visualization, the analysis explores salary distributions, unemployment risk, graduate education premiums, and gender representation across academic fields. The goal is to provide data-driven insights that support informed educational and career decision-making.

Dataset Overview

The analysis integrates multiple datasets covering:

- Employment and salary outcomes across all age groups
- Employment statistics for recent graduates
- Graduate versus non-graduate salary comparisons
- Gender representation across majors, including STEM fields

All datasets were cleaned, standardized, and merged using Python before being loaded into a relational SQL database and an Excel-based analytical dashboard.

Data Source and Attribution

The datasets used in this project were sourced from Kaggle and are derived from the American Community Survey (ACS) conducted by the U.S. Census Bureau.

- Dataset Title: *Uncovering Insights to College Majors and Their Outcomes*
- Curated By: **The Devastator** (Kaggle)
- Original Source: U.S. Census Bureau — American Community Survey
- Platform: Kaggle
- URL: <https://www.kaggle.com/datasets/thedevastator/uncovering-insights-to-college-majors>

The data was used strictly for educational and analytical purposes. All credit for data collection and original compilation belongs to the U.S. Census Bureau and the dataset curator.

Dashboard Overview

Figure 1 presents the interactive Excel dashboard summarizing key metrics such as median salary, unemployment rate, graduate salary premium, and gender representation. Slicers allow dynamic filtering by major category, salary thresholds, and female participation.

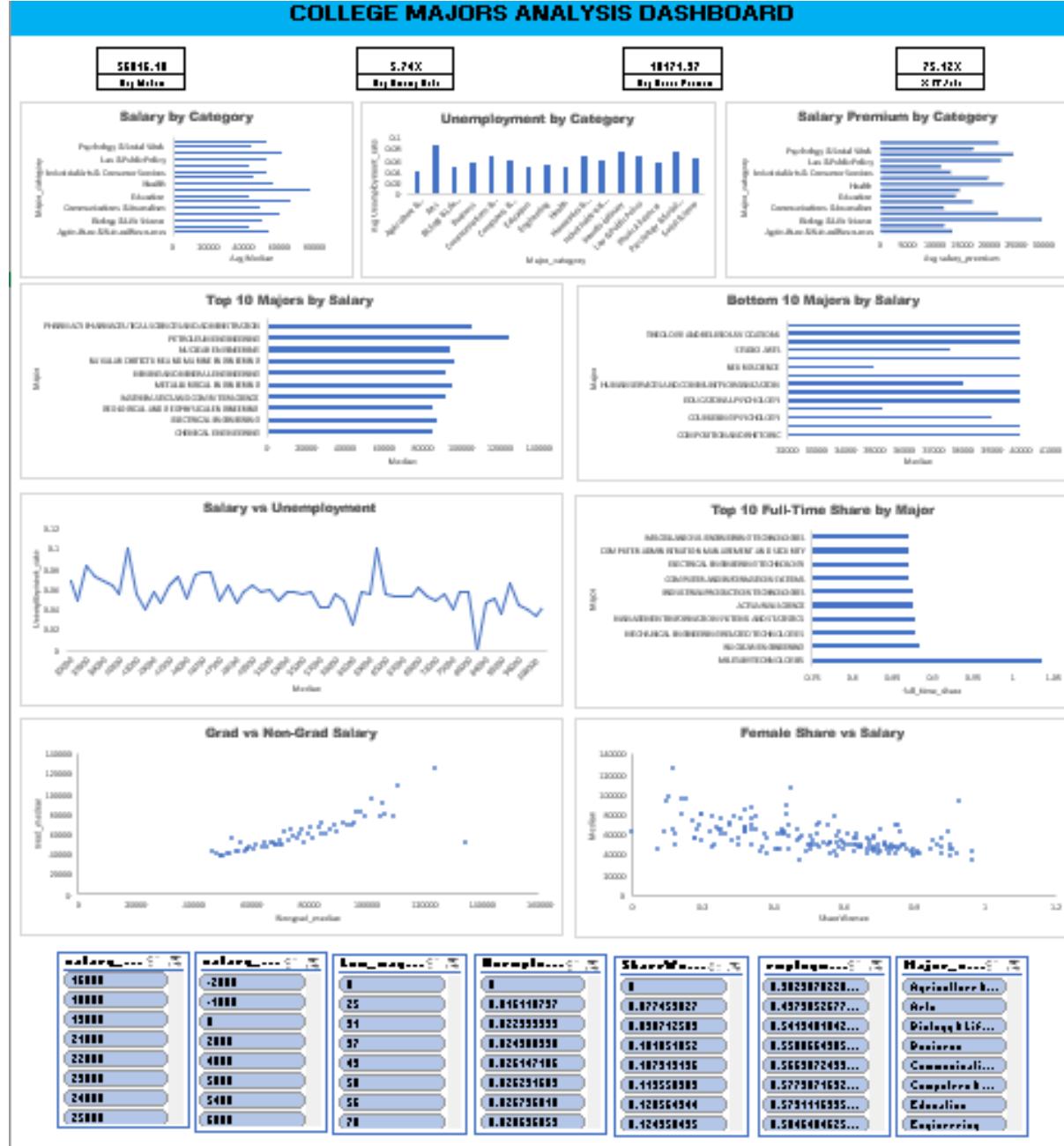


Figure 1: Excel Dashboard Overview: Economic Outcomes of College Majors

Salary Analysis

Median salary varies significantly across academic disciplines. Engineering and technology-focused majors consistently rank among the highest-paying fields, while arts and social science majors tend to report lower median earnings.

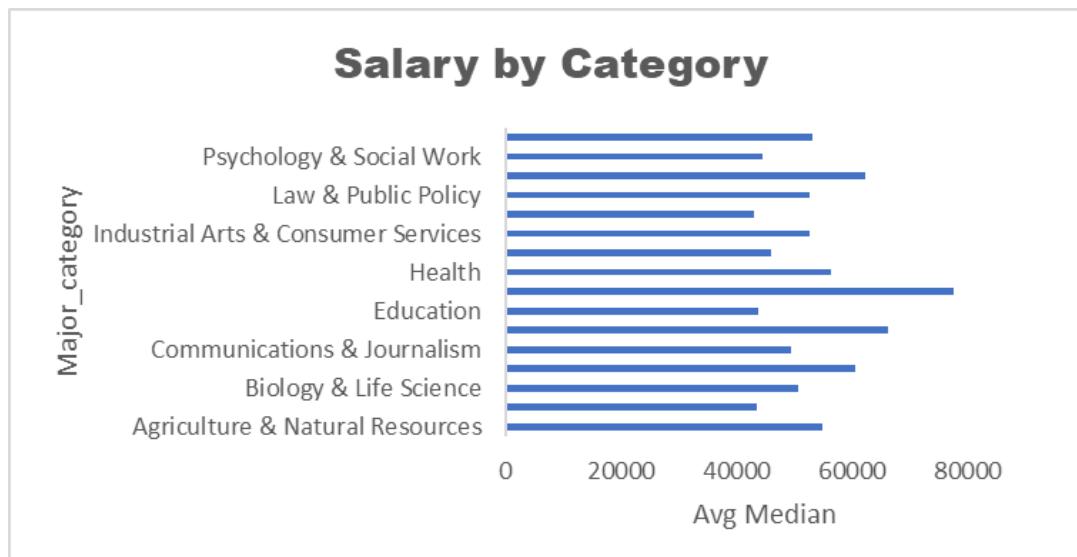


Figure 2: Top Majors by Median Salary



Figure 3: Average Median Salary by Major Category

Unemployment and Employment Risk

High earning potential does not always guarantee employment stability. Certain high-paying majors also exhibit elevated unemployment rates, indicating increased career risk.

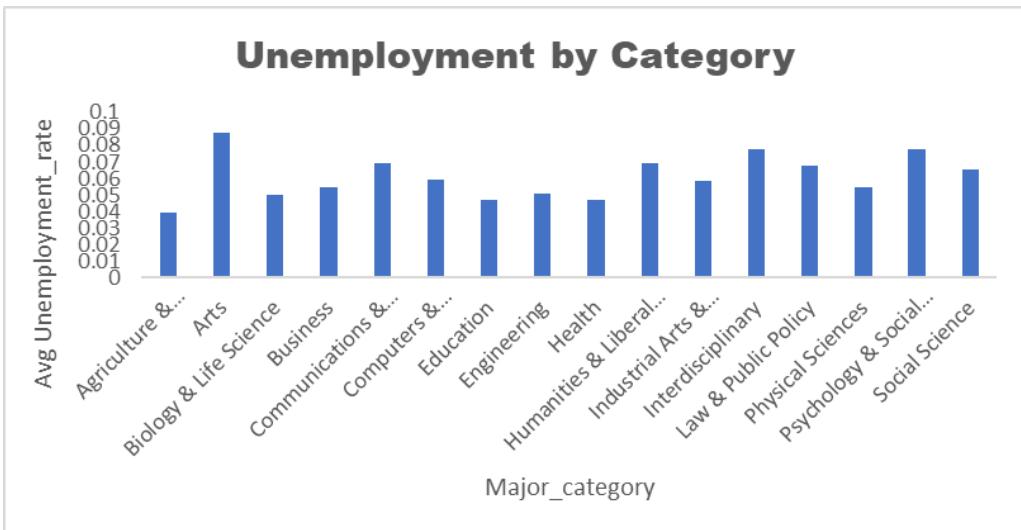


Figure 4: Average Unemployment Rate by Major Category



Figure 5: Median Salary vs Unemployment Rate by Major

Graduate Education Premium

Graduate education generally provides a measurable earnings advantage. Technical and professional majors demonstrate the highest graduate salary premiums, reinforcing the economic value of advanced education in specialized fields.

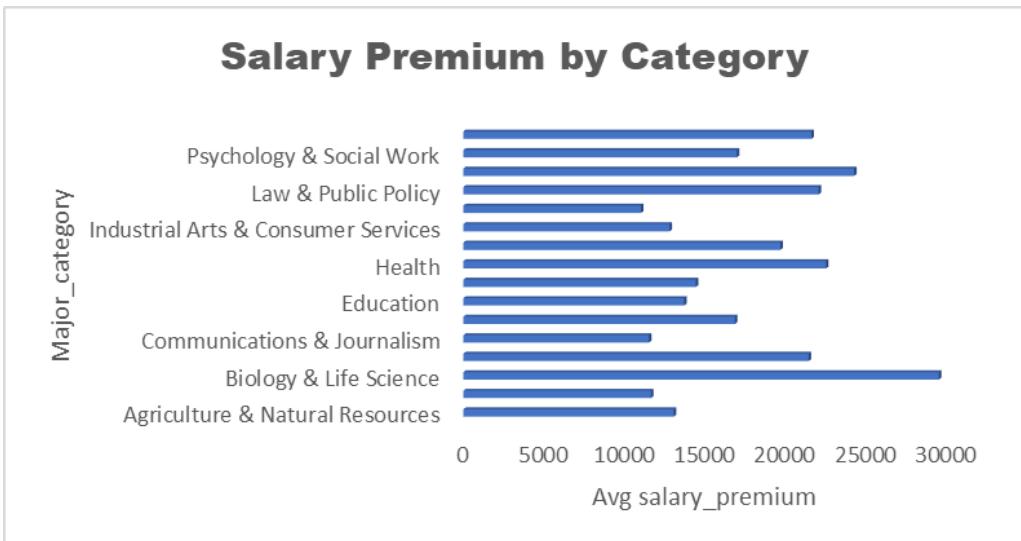


Figure 6: Average Graduate Salary Premium by Major Category

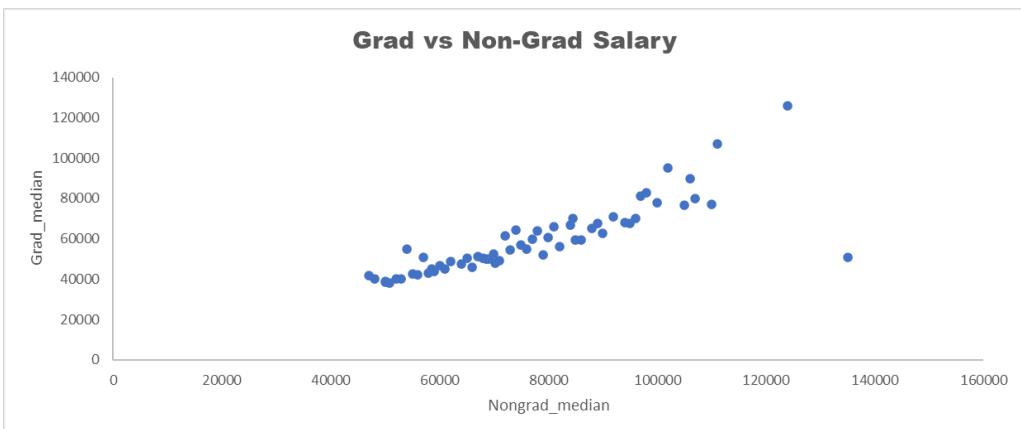


Figure 7: Graduate vs Non-Graduate Median Salary Comparison

Gender Representation and Salary Trends

Gender distribution across majors remains uneven. Majors with higher female representation tend to exhibit lower median salaries, highlighting persistent structural and occupational disparities within the labor market.

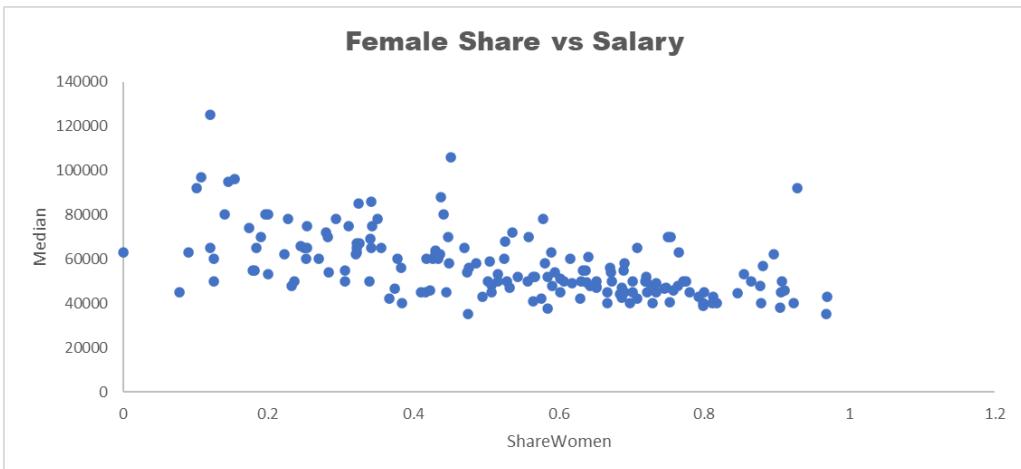


Figure 8: Female Share vs Median Salary by Major

Key Insights

- Engineering and STEM majors offer the highest median salaries overall.
- High salary does not necessarily correlate with low unemployment risk.
- Graduate degrees significantly enhance earning potential across most fields.
- Majors with higher female participation tend to have lower median salaries.

Conclusion

This project demonstrates a complete analytical workflow combining Python, SQL, and Excel to extract meaningful insights from real-world data. The resulting dashboard and findings provide a practical decision-support tool for students, educators, and policymakers evaluating academic and career pathways.