Maximizing University Success: An Analysis for Ranking Factors

Group P008: Yizhou Ding, Junna Cao, Zeyuan Cao

SCAN ME

MOTIVATIONS

As a UW student, this study is crucial for improving and expanding our understanding of higher education success factors. By utilizing machine learning, university administrators can effectively identify areas for improvement by analyzing the multitude of factors that influence institutional ranking. this examination of university ranking factors provides valuable insights into the broader impact of colleges on society and the global knowledge economy.

METHODOLOGY

General Steps

> Install and import necessary packages and libraries.

> Clean, process, and combine datasets: view dataset, drop missing values, select columns, change data types, join datasets

> Utilize machine learning models to fit processed datasets, calculate correlation ratio, university numbers and prediction accuracy.

> Visualize the output

> Perform exploratory analysis, connect with socioeconomic, geological, political issues

> Test functions and codes

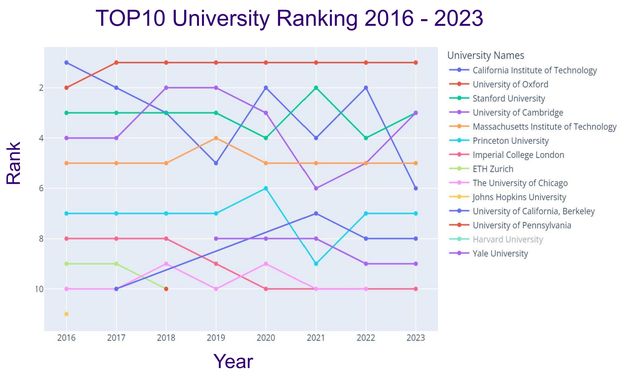
FUTURE DEVELOPMENT

> Focusing on the connections between the university and industry/career development

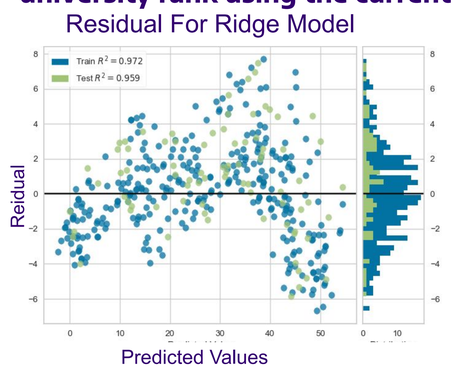
> Considering the environmental factors which influence all the employees, faculties, and students' daily life. The factors include safety issues, climate(weather), natural resources for students who majored or conducted research in the science area, etc.

RESEARCH QUESTIONS

Q1: How does the Top 10 universities ranking change over from 2016 to 2023?



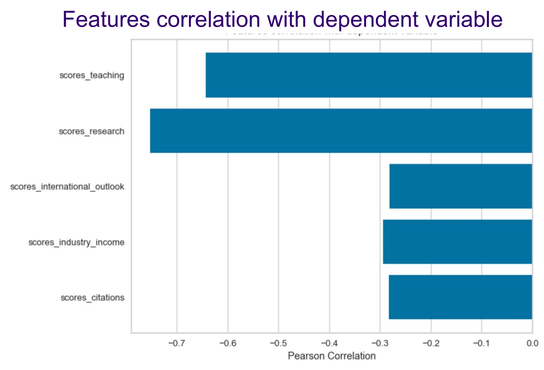
Q2: How accurate is the prediction of future university rank using the current dataset?



Both the test R^2 and train R^2 are higher than 90%.

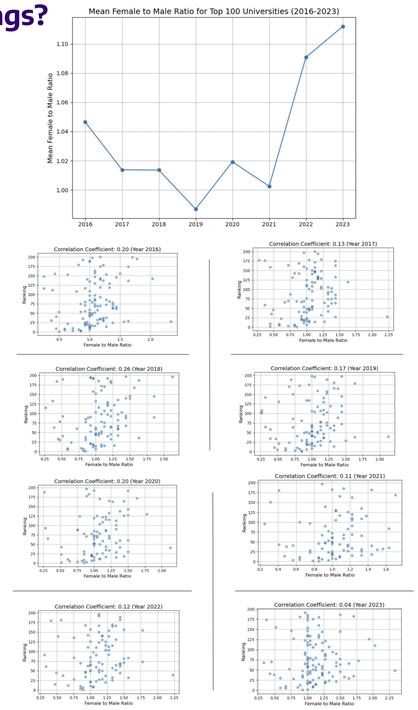
The model fits the dataset well.

Q3: What is the impact of each feature on the university ranking/overall score?



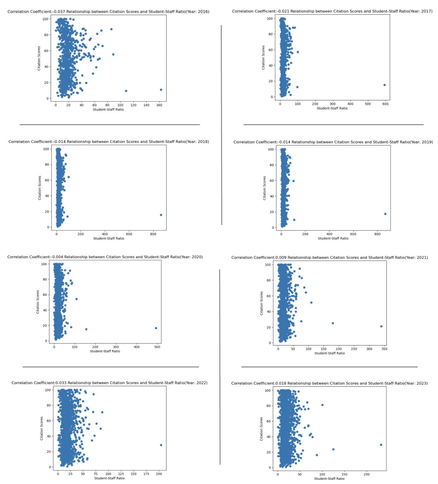
Teaching score and research score are the two most influential factor to the ranking

Q4: What is the trend in the female-to-male ratio across from 2016 to 2023, and is there a correlation between this ratio and university rankings?



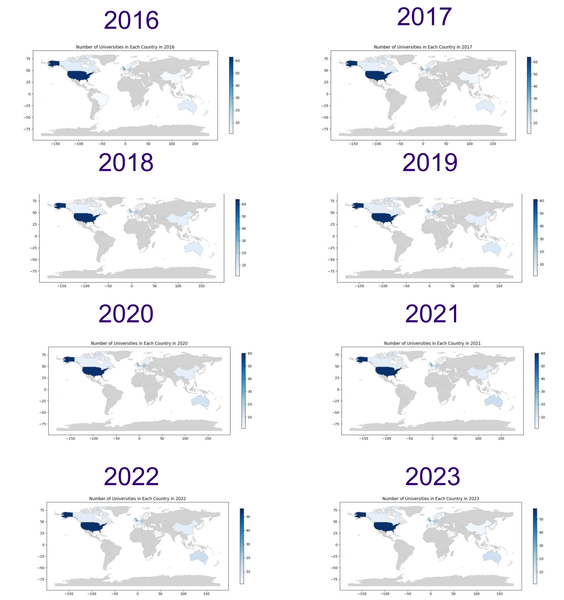
The ratio increased, however, university rankings do not closely correspond with gender ratio

Q5: What is the correlation between the student-to-staff ratio and citation score in the dataset?



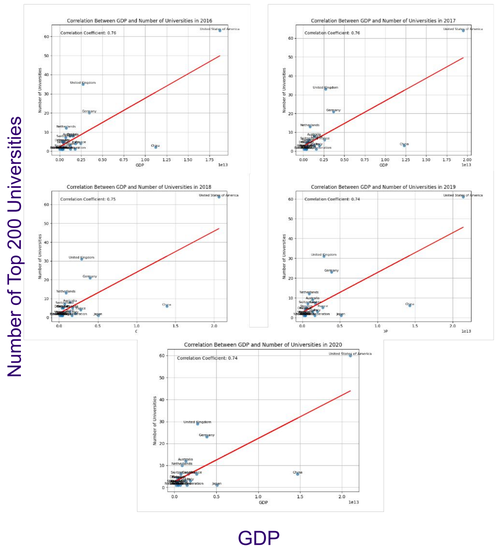
No correlation between student-staff ratio before 2020. After 2020, the data shows a positive connection. The COVID-19 pandemic may explain this association.

Q6: What is the geographical distribution of the top 200 universities in the world?



The top 200 universities are concentrated in countries in North America and Europe.

Q7: What is the correlation between the economic status of a country and the number of top 200 universities?



There is a moderately strong positive correlation (correlation coefficient of 0.74 to 0.76) between GDP and the number of top 200 universities.