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| **ECON 6750**  **Introduction to Econometrics**  **Project proposal** | Team #4  1.Huzi Sun  2.Boyu Cao  3.Garrett Blinkhorn  4.Jordan Reticker  5.Mac Ferguson |

**Exploring and predicting the *U.S. News & World Report* rankings of colleges and universities by linear regression**

**Empirical Question:**

US News & World Report ranking are important to both students and university administrators, as students rely on the rankings for guidance when deciding where to attend school and school administrators compete to make their schools as attractive as possible to prospective students. We want to explore and predict the ranking of colleges and universities by investigating various evaluation criterion that have been utilized in the US News & World Report ranking systems. Can we utilize linear regression to accurately predict the ranking of the university? Can we determine which features weight higher than the others? Can we fit the model better by including the interaction terms? Is there a need for proxy variables and instrumental variables? Which optimization method is better in this model, MLE, OLS, weighted OLS or two stage OLS?

**Econometric Model:**

We will be using a linear regression model on the dataset, as specified below:

Ranking ~ instate\_tuition + outstate\_tuition + room\_and\_board + enrollment + school\_type + religious\_affiliation + acad\_calendar + setting\_urban + setting\_suburb + endowment + salary + accept\_rate + stud\_fac\_ratio + four\_year\_grad\_rate

While this forms our preliminary model, we will investigate issues such as multicollinearity within the dataset and potential interactive effects of the data in determining a final model for this problem. It may also be necessary to change the scale of certain variables as to better ascertain their predictive impact.

**Source:**

https://www.usnews.com/best-colleges/rankings/national-universities?\_mode=table

**Data Dictionary**

|  |  |  |
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| **Variables Name** | **Description** | **Unit** |
| ranking | The college rank from US New & World Report | # |
| instate\_tuition | Tuition amount for in-state students | US Dollar |
| outstate\_tuition | Tuition amount for out-state students | US Dollar |
| room\_and\_board | Approximate cost for room and board for the school | US Dollar |
| enrollment | Number of students enrolled | Person |
| school\_type | Public or private school (1 is private, 0 is public) | Dummy variable |
| religious\_affiliation | The school has religious affiliation or not (0 is non-religious, 1 is religious) | Dummy variable |
| acad\_calendar | The school uses semester or not (1 is semester, 0 is otherwise) | Dummy variable |
| setting\_urban | Whether the school is located in urban (1 is urban, 0 is non-urban) | Dummy variable |
| setting\_suburb | Whether the school is located in suburb (1 is suburb, 0 is non-suburb) | Dummy variable |
| endowment | Financial resources for supporting the school | US Dollar |
| salary | Medium salary for student after graduate | US Dollar |
| accept\_rate | Acceptance rate of the school | Percentage % |
| stud\_fac\_ratio | Ratio for students and faculties | Students per Faculty |
| four\_year\_grad\_rate | Percentage for student who graduate in 4 years | Percentage % |