



# Factors Most Important to University Ranking

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# Research Background

**Question:** Which characteristics of a university are most associated with rankings on the Niche College Ranking list? Of these characteristics, what is relationship between high and low rank?

# Data



2023 Best Colleges in America

- College name, rank



U.S. DEPARTMENT OF EDUCATION  
College Scorecard

- **Categorical Variables:** Region, Public vs. Private, etc.
- **Numerical Variables:** Avg. SAT, Avg. Family Income, etc.

# Approach #1: Numerical Variable Analysis

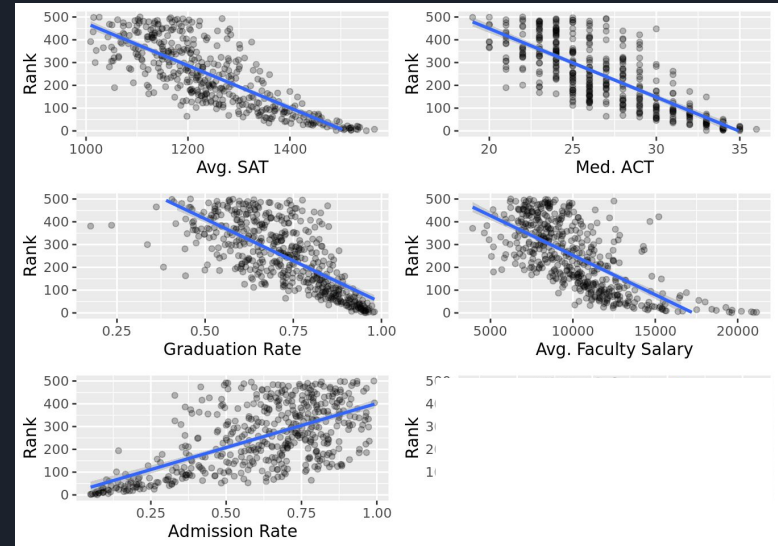
## Methods

1. Create separate linear models between all **numerical explanatory variables** and **Niche rank**.
2. Order  $R^2$  of models to determine strongest correlations.
3. Compare scaled slope to determine greatest influence on higher rank.

## Results

- Trend: relationships with higher  $R^2$  also have higher scaled slopes. Most associated variables are also most influential.

variable	R-Squared	Scaled Slope	Un-scaled Slope
Avg. SAT	0.6291468	-115.00	-0.9277
Med. ACT	0.6062324	-112.90	-30.0400
Graduation Rate	0.5137627	-103.50	-735.2000
Avg. Faculty Salary	0.4692148	-98.89	-0.0347
Admission Rate	0.4048157	91.74	387.0200



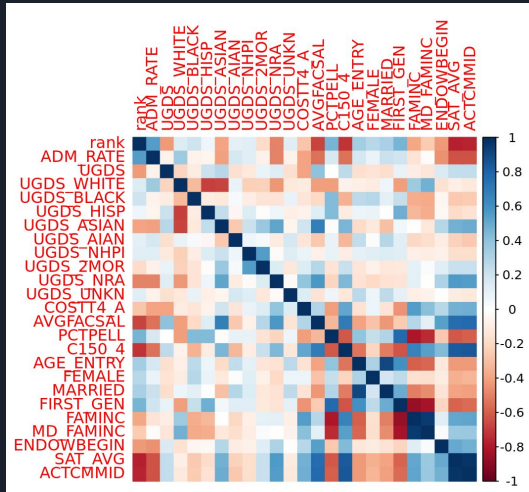
# Approach #2: Stepwise Regression Model

Final Model:

```
rank ~ REGION + CONTROL + CCBASIC + ACCREDITAGENCY + ADM_RATE +  
      UGDS + UGDS_ASIAN + UGDS_2MOR + UGDS_UNKN + COSTT4_A + AVGFACSAL +  
      AGE_ENTRY + SAT_AVG + FIRST_GEN + UGDS_HISP
```

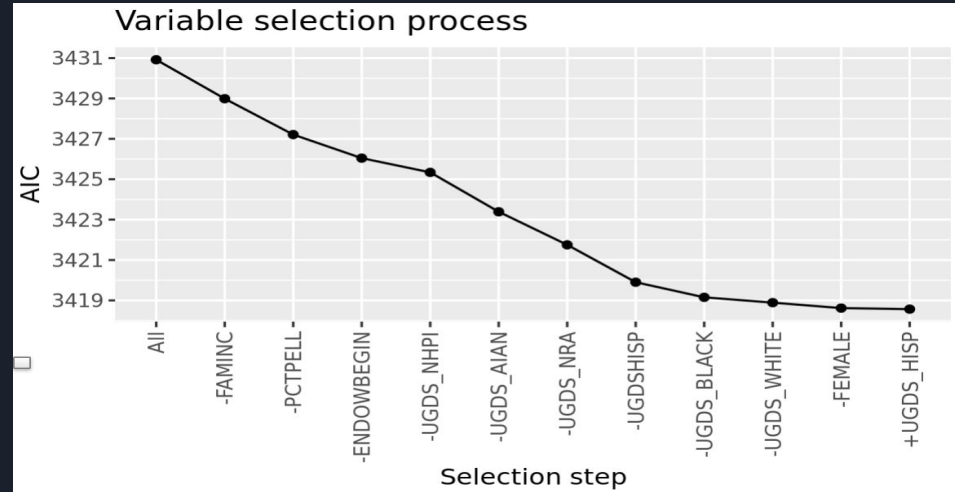
## Manual Selection

Correlation matrix



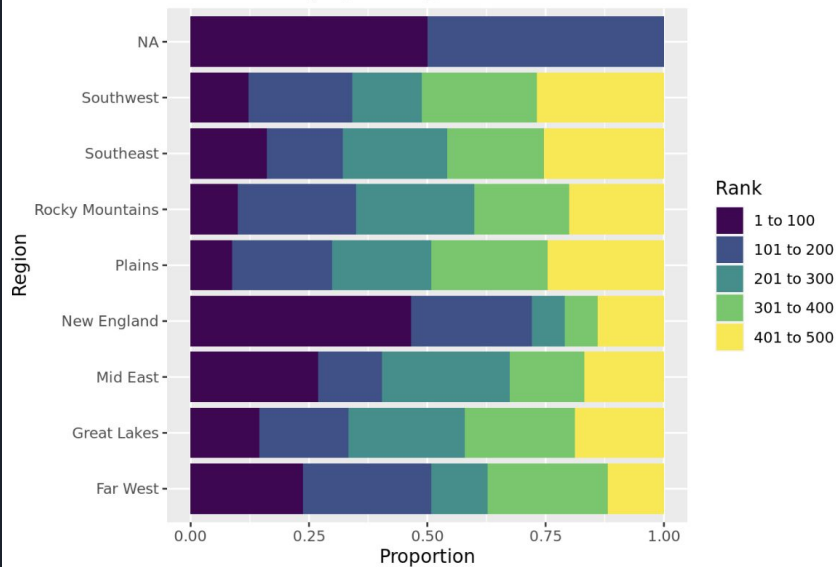
## Automatic Selection

Forward + backward selection by AIC

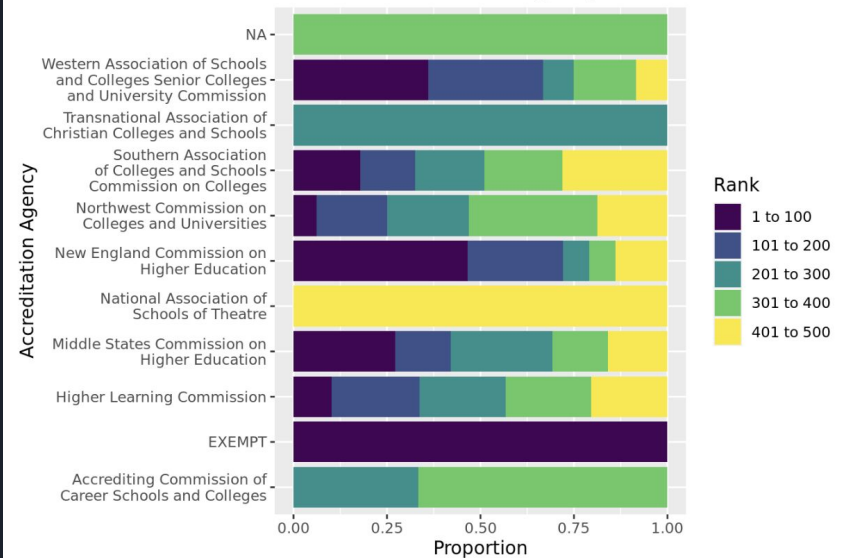


# Categorical Variable Analysis

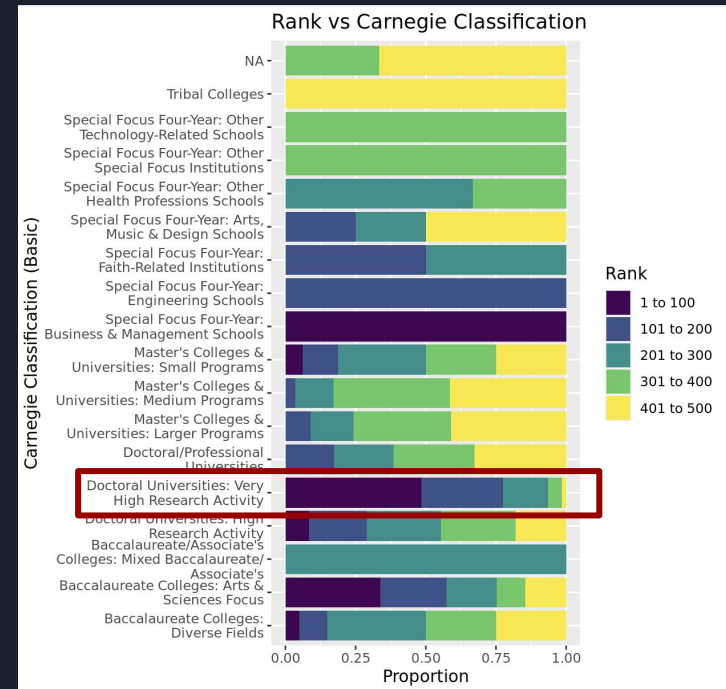
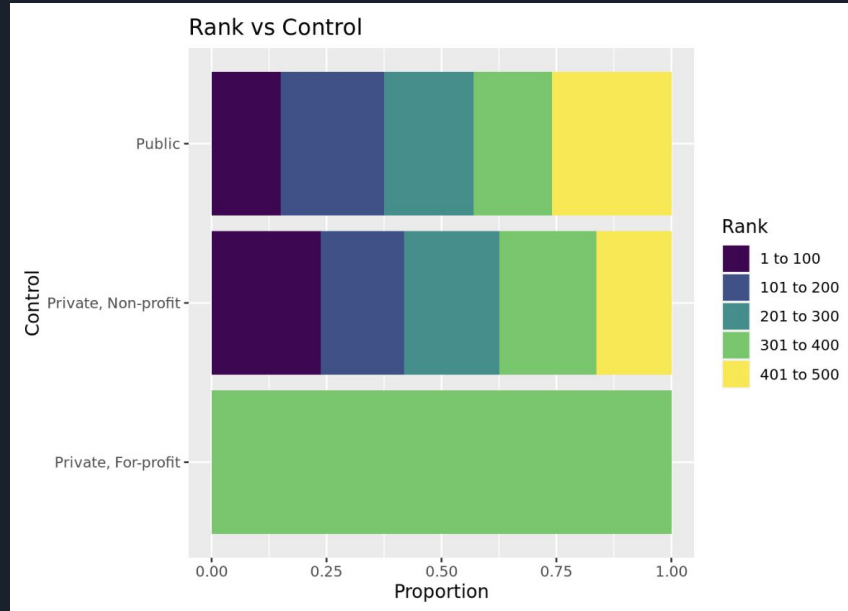
Rank vs Geographic Region of the United States



Rank vs Accreditation Agency



# Categorical Variable Analysis





# Conclusion and future works

- **Most Important: selectivity, resources, and outcomes**
  - Five most associated and influential numerical variables: Avg. SAT - Avg. ACT - Graduation Rate - Average Faculty Salary - Admission Rate
- **Limitations:**
  - no robust calculation of categorical variables individually
  - assumed that all variables had linear relationship so we could create stepwise regression
  - these are all things that could be fixed by learning new methods
- Look at more ranking systems, look at more schools