Project Proposal

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11/15/2023

For my final project, I will be exploring CU FCQ data. The FCQ data set contains the average score for several questions regarding the effectiveness of a given instructor in a certain area on a discrete numeric scale. Before 2020, there were nine of these questions with values between 1 and 6, including an ‘instructor overall’ question. As of 2020 several more questions were added but the ‘instructor overall’ question was removed and the values are between 1 and 5.

The goal of my project is to determine the factors that are most related to each other and which best predict the instructor overall before 2020 and the degree to which the professor challenged students to develop knowledge and understanding since 2020. Of the questions in the survey since 2020, the degree to which the professor challenged students to develop knowledge and understanding makes the most sense as a response variable because it can be a product of the other variables which are more granular, such as providing feedback on my work that helped students improve and considering diverse perspectives during class or in assignments. In addition, challenging students to develop knowledge and understanding is often the goal of a class.

The methods I plan to use are a linear regression model with stepwise feature selection, a random forest and a feed forward neural network. This provides a variety of techniques ranging from simple and interpretable to complex and impossible to trace. The random forest provides a middle ground because it is more complex than a linear regression but it can still provide feature importance values that allow for insight into the factors that best predict the response. Success will be measured using R^2 because it allows for straightforward comparison between the differently scaled response variables. In addition, I plan to analyze a correlation matrix using the results since 2020 in particular because there are many predictor variables that don’t all lend themselves to a single response and may have interesting relationships between each other.