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NBA Shooting Trends and Offensive Strategies

The purpose of this project is to examine shooting trends and offensive strategies in the NBA over the course of 19 seasons. With the increase of three-point shot attempts over the last decade, we aim to see if shooting more threes really does correspond to more wins. In addition, we understand that some teams focus heavily on isolation play while others prioritize team oriented scoring, making us also look at type of offensive play as a predictor for wins. The data was collected from NBA.com using the NBA_api python library. It was taken from the team shooting statistics for every season from 2004-2023.

We began our analysis by doing multivariate regression using the best subsets method. Using the "best" model produced by best subsets, we found that field goal percentage, three-pointers made, three-point percentage, effective field goal percentage, and blocks allowed were significant predictors of winning percentage. This model had an adjusted R-squared value of 0.438. However, in order to account for multicollinearity concerns from this model, we ran a ridge regression. The results produced an R-squared value of 0.439, which is very interesting considering the fact that the adjusted R-squared from our OLS model was 0.438.

We also ran basic ANOVA that showed how there were more team-oriented offenses in 2020-23 than there were in 2008-10 and that 3 point attempts increased after the 2015-2016 season, making it very different from the early 2000's. Based on the results of our ANOVA, we were curious to see how unsupervised learning techniques classified the teams into different groups based on different shot types and overall winning percentage. Since the optimal number of clusters was two, the teams were grouped as either "good" or "bad."

Our findings indicate that efficient three-point shooting, as well as team offense generally lead to higher winning percentages.