College Basketball Win Prediction

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What and How?

Question

- Can we predict the number of wins using only the team stats?

Which features will we use?

1. “Four Factors of Basketball Success” from Dean Oliver
    a. There are four most important strategies to win a basketball game
        i. Score on every possession (effective fields goals)
        ii. Pick up all rebounds (rebounding percentage)
        iii. Get to the foul line (free throw rate)
        iv. Protect the ball (turnover percentage)
2. Adjusted Efficiency Stats
3. All of them

The Data

- Contains data from the 2015-2019 Division I college basketball seasons
- The only missing values come from the “POSTSEASON” and “SEED” columns
- 1757 rows with ~353 teams and 24 columns of team stats and features
  - 351 teams from 2015-2018 seasons
  - 2 new teams were added in 2019 season
- Only used data from 2015-2018 seasons
  - Trained/Validated on 2015-2017 seasons
  - Tested on 2018 season

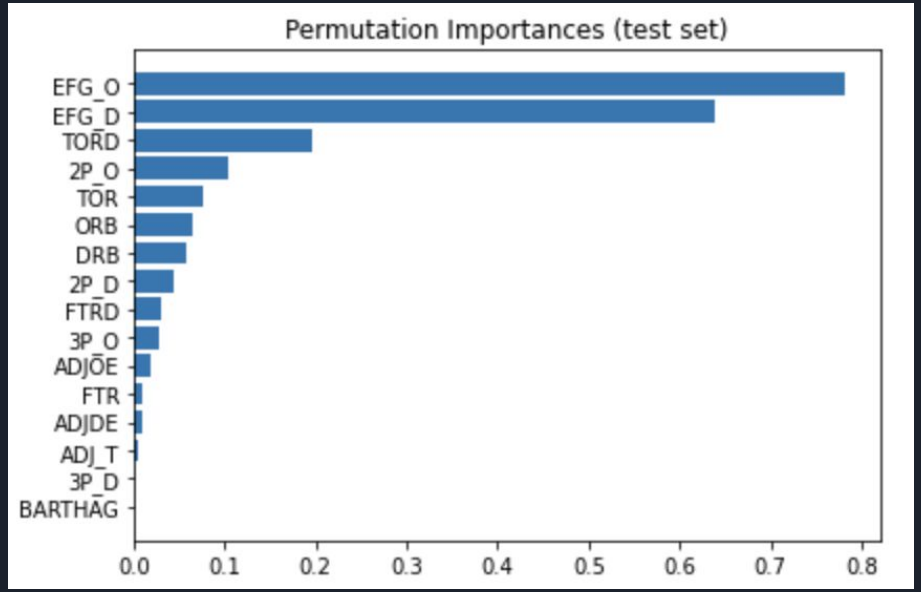
Model Picks and Metrics

- Four Factors Model (EFG_O, EFG_D, TOR, TORD, ORB, DRB, FTR, FTRD)
  - SGDRegressor (Stochastic Gradient Descent Regressor) performed the best for these features
  - Train data: MAE = 1.95
  - Validation data: MAE = 2.02
- Adjusted Efficiency Stats Model (ADJOE, ADJDE, ADJ_T)
  - Yet again, an SGDRegressor model performed the best
  - Train data: MAE = 2.92
  - Validation data: MAE = 2.97
- “All” Features Model (16 features)
  - This time a Ridge regression model performed the best
  - Train data: MAE = 1.92
  - Validation data: MAE = 1.96

Winner: Ridge model using all of the team stats features

Notable Results

- This final model had an MAE = 1.93 on the test data
  - On average predicted within “1.93” wins of the actual team wins in 2018 season
- What did this model consider important?



Conclusion

- “That’s why we play the game…”
  - Our best model utilized as many features possible about each team to make most accurate predictions
- Yet, our prediction accuracy was pretty respectable
- There is a lot to uncover from the numbers
- Future models:
  - Consider including school name, conference played in, etc…
  - Can we expand predictions to success in the postseason?
- Beyond this dataset:
  - Are there other stats that can improve our predictions? Could there be a different or new stat that can be just as predictive as all of these stats together?