

# NBA Players' Salaries

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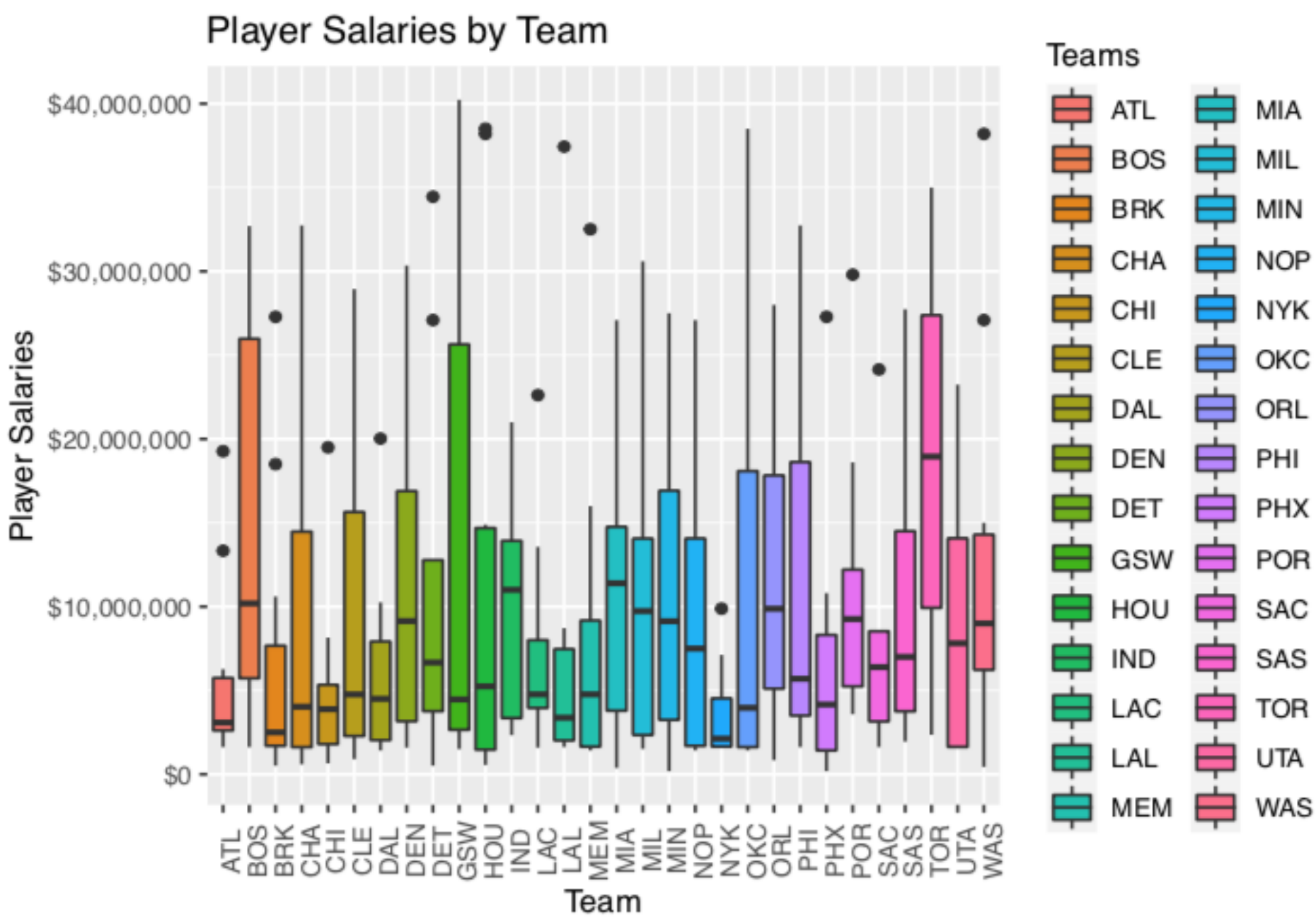
## Introduction

After each season, NBA team rosters undergo many changes due to free agency and trade deals. Distinguished players often have a higher value and achieve this status through their in-game performances.

In this study, we evaluate the ability to predict NBA players' salaries based on their performances in previous seasons. In order to gain more insight on the relationship between NBA players' performances and their salaries, we have chosen each NBA player's stats associated with their performances in the 2018-2019 season from RealGM and each NBA player's salary in the 2019-2020 season from ESPN.

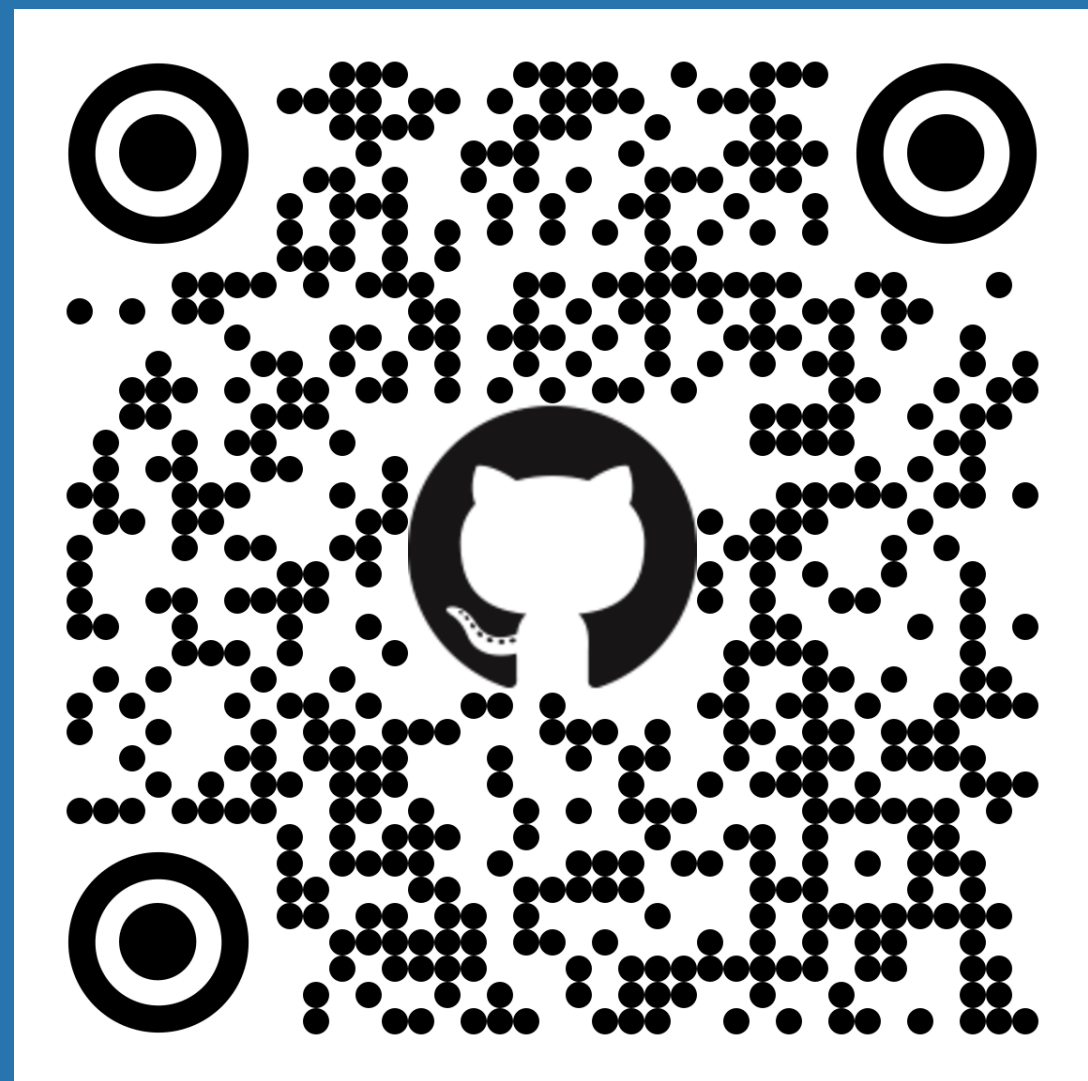
## Hypothesis

Our null hypothesis is that we will not be able to predict NBA players' salaries based on the stats of their previous seasons, since there are many underlying factors involved besides performance.



2019-2020 season

An NBA player's performance in one season has a significant impact on their salary for the next season.



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## Methods

We removed linear combinations and correlated variables from our data set to reduce multicollinearity. Then we performed best subset selection and used Mallows' Cp and BIC to determine the most significant features. We randomly selected 70% of the players to train a multiple linear regression model using 10 predictors:

$$Salary \sim Team + Position + GP + FGA + 3PM + FTM + TOV + DRB + AST + BLK$$

We found that games played, free throws made, and assists were the most significant predictors.

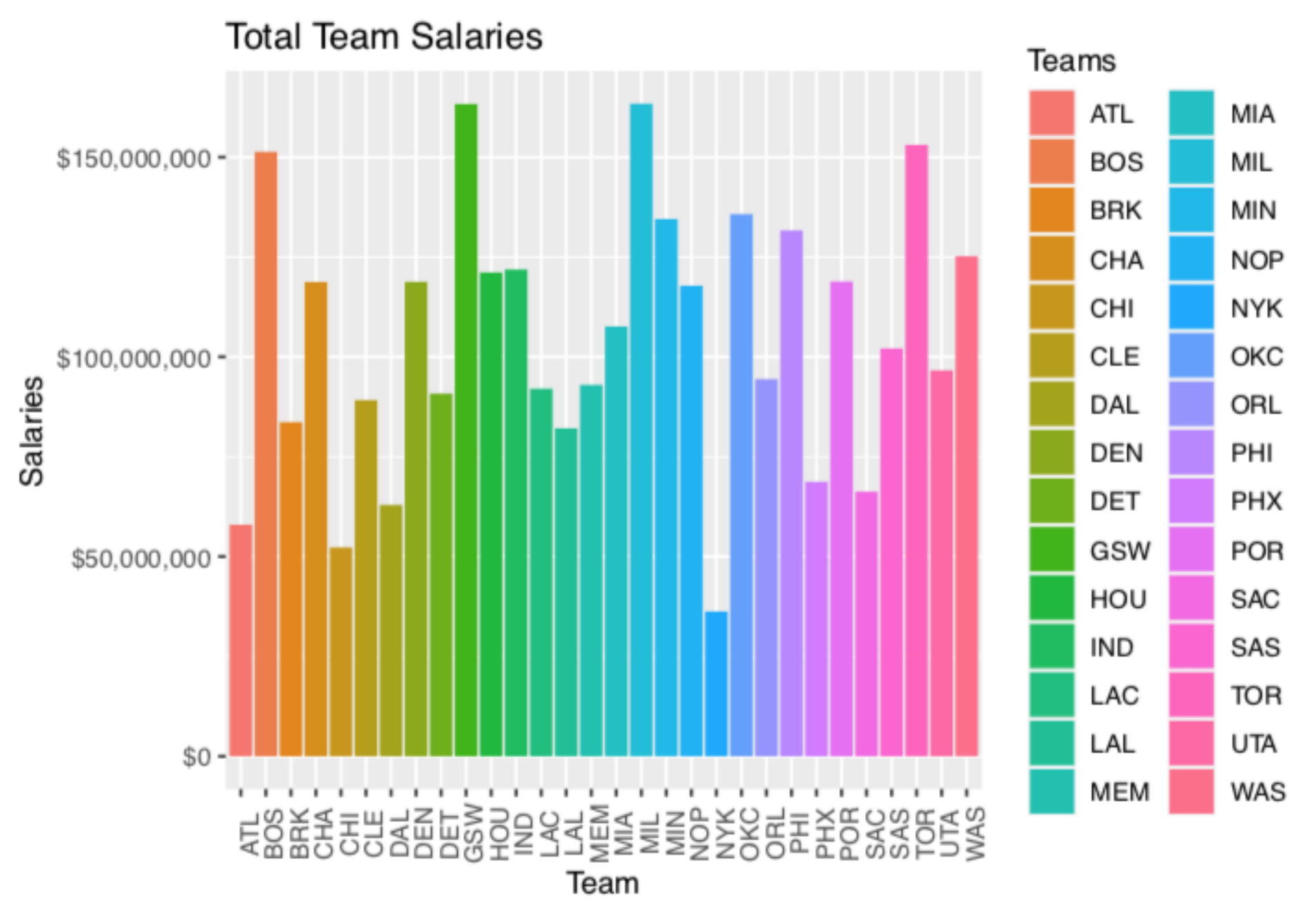
## Results & Conclusions

Our model achieved an  $R^2$  of 67.29% and an adjusted  $R^2$  of 59.96%. Using our model, we made predictions on the remaining 30% of athletes. The result was an RMSE of \$7.7 million.

## Limitations & Next Steps

Although we obtained a decent  $R^2$ , limitations in our model include missing some players' salary data as well as not taking into consideration the variation in each teams' budget.

Our model assumes that a players' salary contract is determined only by their performance in their previous season, ignoring longer term contracts.



2019-2020 season