

Predicting whether the Los Angeles Lakers will have enough wins to directly advance to the 2022 – 2023 NBA Playoffs.

Purpose of the Project

The purpose of this project is to predict whether the Los Angeles Lakers will have enough wins to directly advance to the Playoffs for the 2022 – 2023 season by performing a set of correlation and regression analysis.

About the Project

The NBA (National Basketball Association) can be defined as having 2 distinguished periods during a season. The first, is the regular season which consists of 30 teams that play 82 games, and the second, a postseason tournament called the “Playoffs” to determine the league champion. Prior to the 2019 – 2020 season, teams that finished within the top 8 seeds in their respective conference, the East and the West, were advanced to the Playoffs. However, with the introduction of the “Play-Ins¹”, only the top 6 teams from each conference advance to the Playoffs while teams that finish the season between 7th and 10th seed compete for the final 4 spots (2 spots in the East and 2 spots in the West).

This analysis will look at the statistics of an NBA to determine whether the Los Angeles Lakers will achieve enough wins to finish the season within the top 6 places from each conference, guaranteeing the Lakers a spot in the Playoffs.

The purpose of this project is to create a statistical model that can be used to predict the season record for teams in the NBA. This analysis will look specifically at the Los Angeles Lakers and determine whether they will win enough games to finish the regular season within the top 6 seeds in their respective conference.

Analysis Summary

¹ The play-ins, a preliminary tournament that determines the final two playoff seeds in the Eastern Conference and Western Conference, was introduced in the 2020 – 2021 season.

The Los Angeles Lakers will not win enough games by the end of the 2022 - 2023 season to directly advance to the Playoffs. The team is predicted to win 44 games in the regular season, but to directly advance to the Playoffs, they need to win 49 games. Winning 49 games in the regular season requires the team to have a net rating of 4.5. However, the Lakers have a net rating of 0.6. The net rating is the difference between the offensive rating and defensive rating. Their offensive rating is worse than the league's average, while their defensive rating is better than the league's average. Despite ranking 2nd in the number of 2 pointers and free throws made, the Lakers are ranked 24th in the number of 3 pointers made. Also, the team is shooting at an inefficient rate, negatively affecting their offensive rating because the offensive rating is the number of points produced per 100 possessions. Therefore, the Los Angeles Lakers should look to improve their shooting percentages around all aspects of their offense and attempt more 3 pointers per game.

Key Questions

1. How many wins does the Los Angeles Lakers need in the regular season to be guaranteed a spot in the Playoffs?
2. What does it take to win enough games in the regular season to be guaranteed a spot in the Playoffs?
3. Will the current roster of the Los Angeles Lakers achieve enough wins to guarantee them a spot in the Playoffs?
4. What can the Los Angeles Lakers do to improve their net rating and win enough games to directly advance to the Playoffs?

Key Insights

1. The Los Angeles Lakers is part of the Western Conference; therefore, they will need to win 49 games to finish within the top 6 seeds to directly advance to the Playoffs.
2. The Los Angeles Lakers need to have a net rating of 4.5 to win 49 games by the end of the season, placing them within the top 6 seeds to directly advance to the Playoffs.
3. The Los Angeles Lakers will not have enough wins to directly advance to the Playoffs for the 2022– 2023 season. The Los Angeles Lakers, with a net rating of 0.6, is predicted to win 41 games by the end of the 2022 – 2023 NBA season, short of the necessary 49 games.
4. The net rating is the difference between the offensive rating and defensive rating. The Lakers's offensive rating is ranked 20th compared to the rest of the league, and their defensive rating is ranked 11th compared to the rest of the league. The Lakers' defensive rating is better than the league's average, but their offensive rating is slightly worse than the league's average. So, the Lakers should prioritize increasing their offensive rating. The current roster is ranked 2nd in making 2 pointers, 25th in making 3 pointers, and 2nd in making free throws. However, they are shooting at an inefficient rate, resulting in

a lower offensive rating as the number of points produced per 100 possessions is negatively affected. The Lakers should look to improve their shooting percentages and also attempt more 3 pointers per game.

About the Data

The data contains season statistics for the 30 teams in the NBA (National Basketball Association) from the seasons that represent the Modern Era² of basketball, 2013 – present. The data that represents the 2023 season was used after the statistical model was created to predict the number of games the Los Angeles Lakers will win by the end of the 2022 – 2023 season. From the data sources the tables labeled “Conference Standings,” “Per Game Stats,” and “Advanced Stats” were used. In R, the 3 tables were combined to create one large dataset with a total of 58 columns.

Data Sources:

[2022 - 2023 Season](#)

[2021 - 2022 Season](#)

[2020 - 2021 Season](#)

[2019 - 2020 Season](#)

[2018 - 2019 Season](#)

[2017 - 2018 Season](#)

[2016 - 2017 Season](#)

[2015 - 2016 Season](#)

[2014 - 2015 Season](#)

[2013 - 2014 Season](#)

Tools Used:

RStudio

1. tidyverse (dplyr, ggplot2)

In Depth Analysis

1. How many games does the Los Angeles Lakers need to win to advance to the Playoffs without going through the Play-in tournament?

² 2013 to present, a period characterized with more efficient shot selections by rewarding three-point shots compared to the two-point shots

(<https://content.iospress.com/articles/journal-of-sports-analytics/jsa200525>)

To directly advance to the Playoffs, a team needs to finish within the top 6 seeds in their respective conference. Therefore, by calculating the number of games the 6th seed wins in the regular season, it will provide a benchmark for the minimum number of games a team will need to win to advance to the Playoffs.

To begin the calculation, all 30 teams in the league were split into their respective conferences. Then, the average percentage of games the 6th seed in the East and the 6th seed in the West won during the regular season were calculated. The average percentage of games the 6th seed in each conference won was calculated due to there being 2 regular seasons where the full 82 games were not played due to COVID-19. Then, this value was multiplied by the standard 82 game season, providing an average number of games the 6th seed in East and 6th seed in the West won throughout the Modern Era of basketball.

$$\begin{aligned}\text{Win Percentage} &= (\text{Total Wins} / \text{Total Games}) \times 100 \\ \text{6th Seed Eastern Conference Win Percentage} &= 53.5\% \\ \text{6th Seed Western Conference Win Percentage} &= 59.9\%\end{aligned}$$

$$\begin{aligned}\text{Average Wins} &= \text{Win Percentage} \times 82 \text{ Games} \\ \text{East Average Wins} &= 43.9 \\ \text{West Average Wins} &= 49.1\end{aligned}$$

The 6th seed in the East wins, on average, 44 games. The 6th seed in the West wins, on average, 49 games.

The Los Angeles Lakers is part of the Western Conference; therefore, they will need to win at least 49 games to finish within the top 6 seeds to directly advance to the Playoffs.

2. What does it take to win 49 games in the regular season to directly advance to the Playoffs?

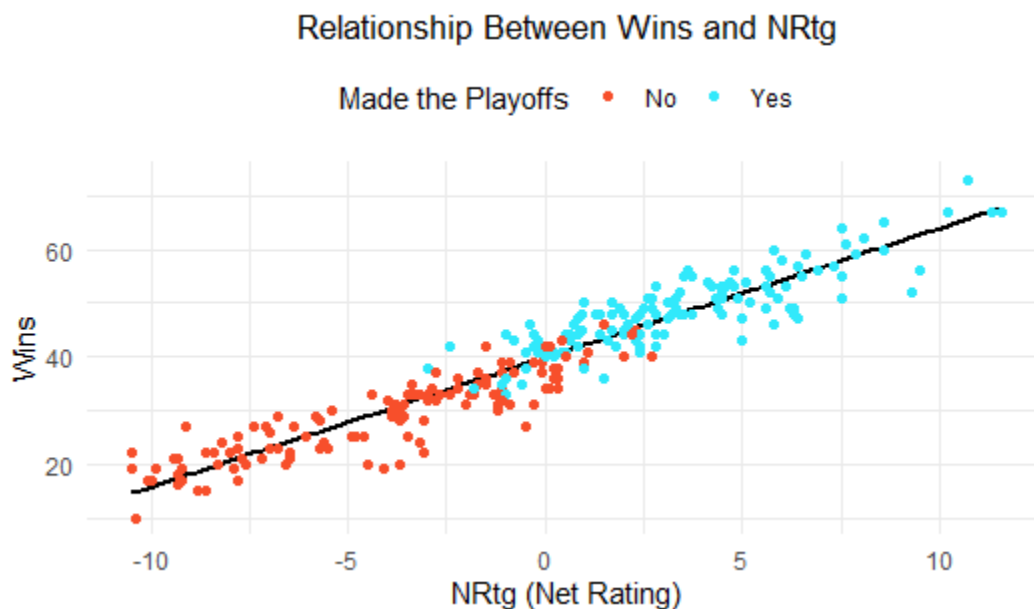
The Los Angeles Lakers need to win 49 games in the regular season. So, how does a basketball win games?

The basketball that scores more points than their opponent by the end of regulation wins. Therefore, the basketball statistic that represents the score and also is related to winning was found by performing a Pearson correlation test between columns that represent the total number of wins to 46 other variables that represent the offensive statistics and defensive statistics from all 30 teams in the association.

From these calculations, the net rating (NRTg) has the highest correlation with 0.95. The net rating is the difference in the score per 100 possessions. It will display the quality of the team's performance.

A linear regression model was created (Figure 1) to determine the necessary net rating to win 49 games in the regular season.

Figure 1



Call:

```
lm(formula = W ~ net rating, data = df)
```

Residuals:

Min	1Q	Median	3Q	Max
-11.6338	-2.3582	0.1805	2.6591	9.0763

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	39.83787	0.23705	168.06	<2e-16 ***
net rating	2.40815	0.04943	48.72	<2e-16 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 3.895 on 268 degrees of freedom

Multiple R-squared: 0.8986, Adjusted R-squared: 0.8982

F-statistic: 2374 on 1 and 268 DF, p-value: < 2.2e-16

Figure 1 shows a positive relationship between the net rating and wins, and the linear regression model shows that the results are highly significant as teams with a higher net rating are more likely to win more games.

From the model, the total number of wins a team will win can be predicted:

$$\text{Wins} = 39.83787 + 2.40815(\text{NRtg})$$

To be guaranteed a spot in the Playoffs, a team needs to win 49 games during the regular season. So, the net rating (NRtg) to win 49 games can be calculated by using the formula above:

$$\begin{aligned} 49 &= 39.83787 + 2.40815(\text{NRtg}) \\ \text{NRtg} &= 4.5 \end{aligned}$$

The Los Angeles Lakers need to have a net rating of around 4.5 to win 49 games by the end of the season.

3. Will the current roster of the Los Angeles Lakers win 49 games by the end of the season to directly advance to the Playoffs?

To determine if the current roster of the Los Angeles Lakers will have enough wins to guarantee them a spot in the Playoffs, the net rating of the current roster needs to be calculated.

This is done by taking the difference between the team's offensive rating (ORTg) and the defensive rating (DRtg).

$$\text{NRtg} = \text{ORTg} - \text{DRtg}$$

2022 - 2023 Lakers's ratings:

$$\begin{aligned} \text{ORTg} &= 114.5 \\ \text{DRtg} &= 113.9 \end{aligned}$$

2022 -2023 Lakers's net rating (NRtg):

$$\text{NRtg} = 0.6$$

With the calculated net rating, the number of games that the Los Angeles Lakers will win by the end of the season can be predicted by using Figure 1:

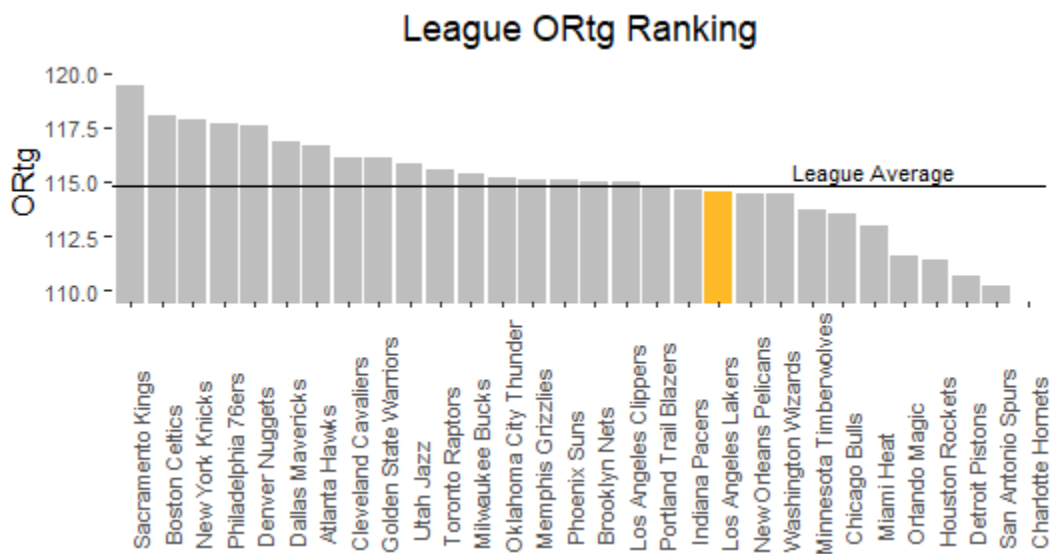
$$\begin{aligned} \text{Wins} &= 39.83787 + 2.40815(\text{NRtg}) \\ \text{Wins} &= 41.3 \end{aligned}$$

The Los Angeles Lakers will not have enough wins to directly advance to the Playoffs for the 2022– 2023 season. The Los Angeles Lakers, with a net rating of 0.6, is predicted to win 41 games by the end of the 2022 – 2023 NBA season, short of the necessary 49 games.

4. What can the Los Angeles Lakers do to improve their net rating and enough games to directly advance to the Playoffs?

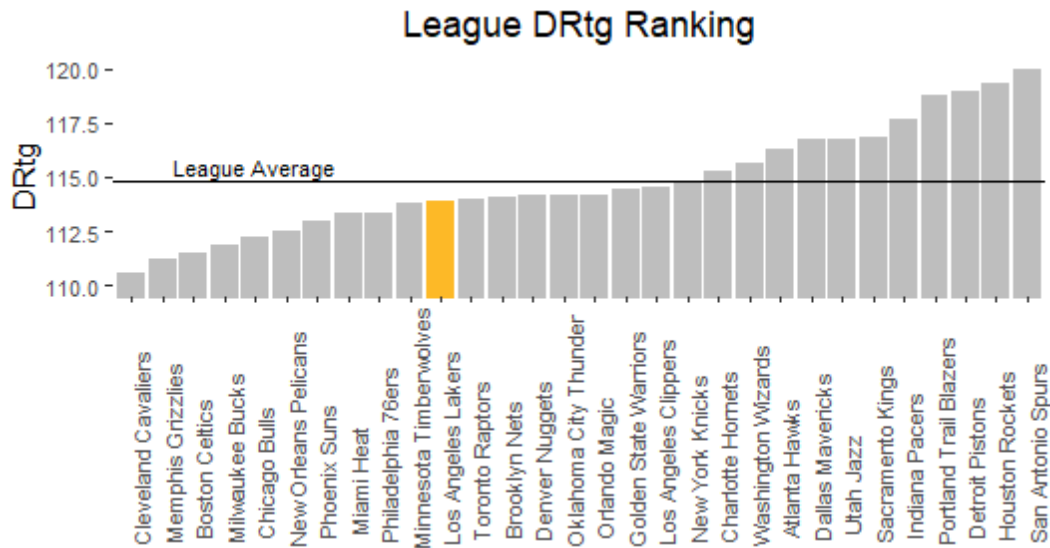
The Lakers need to increase their net rating by 87% in order to finish the season within the top 6 seeds in the Western Conference to directly advance to the Playoffs. Breaking down their offensive rating and defensive rating will provide insights regarding areas of improvement to increase their net rating.

Currently, the Los Angeles Lakers's offensive rating (ORTg) is ranked 20th out of 30 teams, slightly worse than the league average.



*Higher ORtg is more optimal

Their defensive rating (DRtg) is ranked 11th out of 30 teams, lower than the league's average defensive rating.



* Lower DRTg is more optimal

Therefore, the Lakers' priority should be to increase their offensive rating. By further breaking down their offensive statistics and tendencies, it will provide solutions to improve their offensive rating by creating a more efficient offensive to increase the number of points scored per 100 possessions.

Rank of Lakers's Offensive Statistics Compared to 29 Other Teams

	2 Pointers Made per Game	2 Pointers Percentage per Game	3 Pointers Made per Game	3 Pointers Percentage per Game	Free Throws Made per Game	Free Throws Percentage per Game
Rank	2nd	12th	24th	25th	2nd	20th

The Lakers's offense primarily is built around 2 pointers and free throws, but they don't make as many 3 pointers compared to the rest of the league. Despite ranking 2nd in the number of 2 pointers and free throws made, compared to the rest of the league their shooting percentage is ranked on the lower end of the spectrum. This means the Lakers are shooting at a low efficiency because they are attempting more shots. This affects their offensive rating because the number of points produced per 100 possessions decreases with each missed shot.

Also, the Lakers are not making as many 3 pointers compared to the rest of the league. This also affects their offensive rating because the potential number of points produced per 100 possessions because 3 pointers are worth more than 2 pointers and free throws.

Overall, the Lakers need to increase their offensive efficiency by improving the percentage of shots made per possession in order to increase their offensive rating.