Project Phase 3

Edmund Lo, Zexi Lv

Investigative Question #1

For our first question, we wanted to see what factors led to success for teams and what statistical categories could be used to predict wins during the regular season. In Part (a), we ranked the teams by their win/loss percentage and separated the 30 teams in the league into three different groups.

In Part (b), a quick comparison between the averages of each statistical category for the top and bottom groups showed significant differences in several categories. In an 82-game season, the top group averaged 46.6 wins while the bottom group averaged 24.5 wins. The top group averaged 47.77 FG%, while the bottom group averaged 45.46 FG%. In addition, there was a big difference in the 3P% with the top group averaging 38.11% compared to 35.07% for the bottom group. This shows that the better teams shot way more efficiently and made a much higher percentage of their shots from anywhere on the court and especially from three-point range. Another big difference was the average points scored in a game with the top group averaging 115.11 points compared to only 109.06 for the bottom group.

In Part (c), we ranked the teams by their FG% and 3P%. All of the teams in the top group ranked in the top 14 in terms of FG%, other than the Portland Trail Blazers. However, in the bottom group, 7 of the 10 teams ranked in the bottom 7 in terms of FG%. For 3P%, 8 of the top 10 teams in the top group were top 10 in 3P%. For the bottom group, 7 of the 10 teams were ranked 22nd or worse in terms of 3P%. A calculation in Part (d) of the averages of the difference between a team's win/loss percentage ranking and the team's ranking in each statistical category further proved that FG% and 3P% have a big impact on winning. FG% and 3P% had the lowest differentials of all of the categories at around 4.8, meaning that the ranks of the teams in terms of wins were close to their ranks in these categories. Teams that scored efficiently, especially from the three, won more games.

Parts (e) and (f) looked at player statistics. First, we wanted to see if the top teams were led by one of the leading scorers in the league. Out of the top 15 players with the highest points per game, 9 of them played on 8 of the top 10 teams in the league. In comparison, there were only 2 of the top 15 scorers playing on one of the bottom 10 teams. This shows that having a top 15 scorer to carry a team's offense can lead a team to many more wins. Lastly, in Part (f) we wanted to see if the experience and age of players affected wins. The average age of the rosters of the top group of teams is 26.65 years old, while the bottom group averaged 25.03 years old. This shows that the more experienced and older teams generally won more games during the regular season than the younger teams.

Investigative Question #2

To investigate the second question, we decided to first check how well success in each statistic translated into successful scoring by examining the average points earned of the top 20 players of each statistic in part (g).

The statistics with the best scorers were FG, FGA (field goals and attempts), FT, FTA (free throws and attempts), 2P, and 2PA (2-pointers and attempts). The average player scored approximately 8.7 points per game. Compared to this, the top players in each of these statistics scored about 3x as many points on average. For example, the players who had the most successful field goals scored 26.9 points per game, while the players with the most 2-pointer attempts scored an average of 24.4 points. Players with the most 3-pointers and attempts (3P, 3PA) were also above average compared to the other stats with 19.6 and 21 points scored per game respectively, which continued the trend of scoring statistics having a positive impact on a player's points.

However, a player's accuracy did not translate well into how many points they score as explored in part (h). The players most accurate in their 2-pointers (2P%), free throws (FT%), 3-pointers (3P%), and field foals (FG%) scored 3.94, 4.48, 4.89, and 5.85 points per game respectively - half as successful as the average player. The most accurate players also did not make many attempts. The players with the highest 2-pointer accuracy attempted them about 3x less than the average player (1.6 compared to 4.23 attempts per game). Similarly, players with the highest field goal accuracy only attempted them only 3.32 times per game, compared to the average of 7.01 attempts. Players who make more attempts are scoring the most points despite not being the most accurate players - you miss 100% of the shots you don't take.

Investigative Question #3

For our third question, we investigated whether there was a connection between how long a coach had been active and how well their team played in part (i). First, coaches had 8.1 seasons of experience overall on average. Compared to this, coaches on teams which made playoffs in the 2020-2021 season had 9.6 seasons of experience and coaches on teams which didn't make playoffs had only 6.3 seasons of experience. Additionally, coaches of top teams from the queries in (a) averaged 10 seasons of experience compared to 9.2 seasons for middle teams and 5.3 seasons for bottom teams. All in all, a coach's experience has a significant effect on their team's success.

Next, we investigated whether there was a relationship between coach experience and player success in part (j). The coaches of the 20 players who scored the most points averaged 8.3 seasons of experience, not differing much from the average of 8.1. And the players of the teams with the 10 most experienced coaches averaged 8.6 points, again matching the average points scored of any player overall of 8.7 points. Overall, there is no relationship between player performance and their coach's experience.