NBA Playoff Experience

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Loading Packages

Here are the packages that I use in this notebook.

```
library(tidyverse)   # for data manipulation
library(nbastatR)    # Load NBA data

# increase size of connection buffer to be able to load box score data
Sys.setenv("VROOM_CONNECTION_SIZE" = 2*131072)
```

Experience Calculation Functions

The code below has the functions that are used to calculate the team playoff experience. Basically, here were the steps:

- 1: filter the playoff game logs so they only contain games prior to the given season
- 2: calculate the total playoff minutes among players that played in the given season
- 3: get an estimate of a team's rotation by taking the top 10 current players in minutes per game among those with at least 5 games played for the team
- 4: calculate playoff experience of a team as its weighted average of playoff minutes among the players in its rotation, where the weights are proportion to minutes per game

```
# This function calculates the playoff experience for each team
# in the given season.
# Arguments:
```

```r
#     season: season to get experience for
#     playoff_logs: df of player playoff game logs for which to gather
#                   experience from
#     absent_list: list of players that did not participate in the play
#                  in the given season (will not include these players
#                  experience calculations)
#     byPlayer: indicator to tell function to return playoff experience
#               by player or by team
getExperience <- function(season, playoff_logs, absent_list = c(),
                          byPlayer = FALSE) {
  # look at only playoff games that occurred BEFORE the given season
  playoff_logs2 <- playoff_logs %>%
    filter(yearSeason < season)
  # get regular season player game logs for season
  rs_player_logs <- getRSLogs(season)
  # get vector of players that played in the regular season
  valid <- rs_player_logs %>% distinct(idPlayer) %>% pull(idPlayer)
  # count total playoff minutes for each (valid) player
  player_playoff_counts <- playerExperience(playoff_logs2, valid)
  # get the estimated team rotation for given season
  team_rotation <- getTeamRotation(rs_player_logs, absent_list)

  # get player playoff experience, player team, player mins per game
  team_players_playoffs <- team_rotation %>%
    # join playoff minutes to team rotation
    left_join(player_playoff_counts, by = c("idPlayer", "namePlayer")) %
    mutate(sumMIN = ifelse(is.na(sumMIN), 0, sumMIN)) %>%
    # filter out players without enough games (5 is an arbitrary number
    filter(G > 5) %>%
    # include only top 10 players in terms of minutes per game
    # why: playoff rotation likely will be way shorter than reg. season
    #      rotation
    group_by(slugTeam) %>%
    mutate(Rk = rank(-Min_G)) %>%
    filter(Rk <= 10) %>%
    ungroup() %>%
    arrange(-Min_G)

  if (byPlayer) {
    return(team_players_playoffs)
  }
```

```r
  # get team playoff experience as weighted avg of playoff minutes
  # where the weights are proportional to mins per game
  team_playoff_exp <- team_players_playoffs %>%
    group_by(slugTeam) %>%
    summarize(experience = weighted.mean(sumMIN, w = Min_G)) %>%
    ungroup() %>%
    arrange(-experience)

  return(team_playoff_exp)
}



getRSLogs <- function(season) {
  # loads regular season game logs for given season
  rs_player_logs <- game_logs(seasons = season,
                              result_types = "player",
                              season_types = "Regular Season")
  return(rs_player_logs)
}

mostRecentTeams <- function(rs_player_logs) {
  # gets team that each player most recently played for
  # relevant for players that switched teams mid-season
  most_recent_team <- rs_player_logs %>%
    arrange(desc(dateGame)) %>%
    select(idPlayer, slugTeam) %>%
    group_by(idPlayer) %>%
    summarize(currentTeam = first(slugTeam)) %>%
    ungroup()
  return(most_recent_team)
}

playerExperience <- function(playoff_logs, valid) {
  # counts total playoff minutes for each player
  player_playoff_counts <- playoff_logs %>%
    filter(idPlayer %in% valid) %>%
    group_by(namePlayer, idPlayer) %>%
    summarize(sumMIN = sum(minutes)) %>%
    ungroup()
```

```
  return(player_playoff_counts)
}

getTeamRotation <- function(rs_player_logs, absent_list = c()) {
  # get most recent team for each player
  most_recent_team <- mostRecentTeams(rs_player_logs)

  # get estimated team rotation
  team_rotation <- rs_player_logs %>%
    # filter out absent players
    filter(namePlayer %in% absent_list == FALSE) %>%
    # calculate games, minutes, mins per game
    group_by(idPlayer, namePlayer, slugTeam) %>%
    summarize(G = n(),
              Min = sum(minutes)) %>%
    ungroup() %>%
    mutate(Min_G = Min / G) %>%
    # include only players playing with current team
    left_join(most_recent_team, by = "idPlayer") %>%
    filter(slugTeam == currentTeam) %>%
    select(-currentTeam)
  return(team_rotation)
}
```

Gather Stats

With this function, we can gather the playoff experience stats for all relevant seasons. For the playoff logs, I included all player games from 1991 to 2023. The earliest season of playoff experience needed is 2011, and I figured that all players who played in 2011 had their first playoff minutes in 1991 or later since 1991 was a whole 20 seasons earlier. For seasons prior to this one, I assumed all players that played in the regular season were available for the playoffs (which is obviously not always true, but I didn't feel it was worth it to examine each case individually and find players injured during the postseason). For 2024, I included a vector of players that are out for the season, and therefore will definitely not be playing in the playoffs. These players are excluded from calculations.

```r
# get playoff logs from 1991 onward
# 1991 is 20 years before 2011, so its a safe lower bound to include al
# players from 2011 onwards that played in playoffs
playoff_logs <- game_logs(seasons = c(1991:2023),
                          result_types = "player",
                          season_types = c("Playoffs"))
```

```
Acquiring NBA basic player game logs for the 1990-91 Playoffs
Acquiring NBA basic player game logs for the 1991-92 Playoffs
Acquiring NBA basic player game logs for the 1992-93 Playoffs
Acquiring NBA basic player game logs for the 1993-94 Playoffs
Acquiring NBA basic player game logs for the 1994-95 Playoffs
Acquiring NBA basic player game logs for the 1995-96 Playoffs
Acquiring NBA basic player game logs for the 1996-97 Playoffs
Acquiring NBA basic player game logs for the 1997-98 Playoffs
Acquiring NBA basic player game logs for the 1998-99 Playoffs
Acquiring NBA basic player game logs for the 1999-00 Playoffs
Acquiring NBA basic player game logs for the 2000-01 Playoffs
Acquiring NBA basic player game logs for the 2001-02 Playoffs
Acquiring NBA basic player game logs for the 2002-03 Playoffs
Acquiring NBA basic player game logs for the 2003-04 Playoffs
Acquiring NBA basic player game logs for the 2004-05 Playoffs
Acquiring NBA basic player game logs for the 2005-06 Playoffs
Acquiring NBA basic player game logs for the 2006-07 Playoffs
Acquiring NBA basic player game logs for the 2007-08 Playoffs
Acquiring NBA basic player game logs for the 2008-09 Playoffs
Acquiring NBA basic player game logs for the 2009-10 Playoffs
Acquiring NBA basic player game logs for the 2010-11 Playoffs
Acquiring NBA basic player game logs for the 2011-12 Playoffs
Acquiring NBA basic player game logs for the 2012-13 Playoffs
Acquiring NBA basic player game logs for the 2013-14 Playoffs
Acquiring NBA basic player game logs for the 2014-15 Playoffs
Acquiring NBA basic player game logs for the 2015-16 Playoffs
Acquiring NBA basic player game logs for the 2016-17 Playoffs
Acquiring NBA basic player game logs for the 2017-18 Playoffs
Acquiring NBA basic player game logs for the 2018-19 Playoffs
Acquiring NBA basic player game logs for the 2019-20 Playoffs
Acquiring NBA basic player game logs for the 2020-21 Playoffs
Acquiring NBA basic player game logs for the 2021-22 Playoffs
Acquiring NBA basic player game logs for the 2022-23 Playoffs
```

```r
# get experience for each season
exp_df <- tibble()
for (i in c(2011:2023)) {
  year_exp <- getExperience(i, playoff_logs)
  year_exp <- year_exp %>% mutate(season = i)
  exp_df <- rbind(exp_df, year_exp)
}
```

```
Acquiring NBA basic player game logs for the 2010-11 Regular Season
Acquiring NBA basic player game logs for the 2011-12 Regular Season
Acquiring NBA basic player game logs for the 2012-13 Regular Season
Acquiring NBA basic player game logs for the 2013-14 Regular Season
Acquiring NBA basic player game logs for the 2014-15 Regular Season
Acquiring NBA basic player game logs for the 2015-16 Regular Season
Acquiring NBA basic player game logs for the 2016-17 Regular Season
Acquiring NBA basic player game logs for the 2017-18 Regular Season
Acquiring NBA basic player game logs for the 2018-19 Regular Season
Acquiring NBA basic player game logs for the 2019-20 Regular Season
Acquiring NBA basic player game logs for the 2020-21 Regular Season
Acquiring NBA basic player game logs for the 2021-22 Regular Season
Acquiring NBA basic player game logs for the 2022-23 Regular Season
```

```r
write_csv(exp_df, "data/nba_experience.csv")

# get experience for this year, using knowledge of players out for seas
absent <- c("Ja Morant", "Steven Adams", "Robert Williams III", "Zach L

exp_df <- getExperience(2024, playoff_logs, absent)
```

```
Acquiring NBA basic player game logs for the 2023-24 Regular Season
```

```r
write_csv(exp_df, "data/nba_exp_2024.csv")
```