Writeup For Question 2: When Are Teams Eliminated From Playoffs

We solved this problem by a “backward” method. The general idea is that: if team A is top 8 in its conference on the last day of the season, then it must be a “playoff”; otherwise, we looked 1 day earlier the best scenario/game results for A so that it could be top 8 on the last day. If team A could make it to top 8 under the best scenario, then A is eliminated only until the last day; otherwise we repeat this step until we find a date when A could make it to top 8 under the best scenario (among all possible match results after that date). Then the next match date of the date we found is the earliest date when A is eliminated from the playoff for sure.

We describe in detail how we find the “best scenario” for team A on a certain date B. For example, team A is ..and we want to find the best scenario for it on…. On B we have the rankings for all teams in east conference, and A is ranked 9. Also we have all remaining game schedules for all teams. The best scenario for A is we want all games of the team ranked 8 at date B … to lose, make it more likely for A to get one rank higher. If A cannot beat the team nearest to it, it could not beat teams that rank even higher. So it would be eliminated on that date since its best rank is 9. In this case, we should keep looking for earlier dates to see if A would be eliminated for sure earlier.

Data structure:

We convert the original data in the following data structure

1. dates: total 193 days in 2016-2017 season.
2. matches: for each date, all matches on that date. E.g. team A vs. team B
3. daily\_scores\_east, daily\_scores\_west: for each date, number of wins and loses for each team by that date. Teams in east and west conferences are separated.
4. daily\_rank\_board\_east, daily\_rank\_board\_west: ranks of each team on each match date. We rank the teams in the descending order of number of wins - number of loses. Teams in east and west conferences are separated.

Functions:

EliminationDate(team,dates,matches,daily\_scores\_east,daily\_scores\_west,daily\_rank\_board\_east,daily\_rank\_board\_west)

Find\_EDate(team,dates,matches,daily\_scores,daily\_rank\_board)

Best\_Final\_Rank(team,date,dates,matches,daily\_scores,daily\_rank\_board):

Best\_daily\_Rank(team,teams,Best\_Rank,Best\_score,daily\_match): given the current rank (Best\_rank) and scores (Best\_score) of a certain conference, and the remaining match schedule (daily\_match), return the best possible rank for a team (team) on a certain date.

Rank(Best\_score):