#1) REQUIRED: After the Golden State Warriors acquired former MVP Kevin Durant in 2016, some NBA fans speculated that the Warriors would not lose consecutive games at any point of the season.\*

a) If you wanted to determine the probability that this prediction would be true (i.e., that the Warriors would never lose consecutive games at any point during an 82-game season), what is one approach (or a few approaches) you may use to solve the problem? What answer do you get? Exact answers are of course welcome, but approaches that lead to approximations (and those approximations) are fine, too (please specify the precision of your estimate). Assume the Warriors have an 80% chance of winning each and every game

Given a season is 82 games long, and the Warriors lose games throughout the season, there are permutations of possible win-loss sequences that avoid consecutive losses. Knowing that the maximum number of losses possible to avoid consecutive losses is 41, we find that the probability of avoiding any consecutive loss is as follows:

Which comes out to .0588168

b) So, would you have agreed with that hypothesis?

Nah.

c) Finally, at least what % of a team's games would a team need to be expected to win (assuming that win probability stays constant from game to game) for there to be a greater than 50% chance that the team never suffers consecutive losses at any point in the season?

90.38%

* **#2) BONUS: When are teams eliminated from playoff contention? Using the results for the 2016-17 regular season as a test case for your quantitative solution, please generate the date that each team was eliminated from playoff contention. We are purely looking for a date when a team was eliminated from playoff consideration, not any specific seed. Please note that your solution should generate the dates automatically, and should use code-based or Excel-based tools. To aid your work, click on this**[**LINK**](https://ak-static-int.nba.com/wp-content/uploads/sites/2/2017/06/NBA_Tiebreaker_Procedures.pdf)**for a .pdf file of the NBA Tiebreaker rules and an**[**.xlsx**](https://ak-static-int.nba.com/wp-content/uploads/sites/2/2017/06/Analytics_Attachment.xlsx)**file with the following three tabs 1) Divisions for the 2016-17 Season, 2) The game results for the 2016-17 NBA Regular Season, 3) A sample that includes the correct formatting for your final submission. Please note that teams that qualified for the playoffs should be labeled "Playoffs" and the date a team is eliminated should be reported in text format, not Excel Date format.**

This question is not mandatory, but you are encouraged to attempt it and submit your work. Please include (at least) the following files in your zip folder: the .csv file with the dates filled in, and any code you used to generate the answer. Please separately include a brief writeup of what you did. If you used Excel to solve, please submit an Excel file in the zip folder with your work, along with your final answer in a clearly labeled tab, again with the writeup separately attached. This is a complicated problem, so we would prefer to see an incomplete solution with explanation rather than no answer.