To get the exact probability would require combinatorics that exhaust all the scenarios (e.g. what are the cases when the Warriors have no consecutive losses if they win 60 games etc.) We decided that would be too consuming and instead used a simulation method that approximates the probability. Given p = 0.8, the probability that the Warriors win each individual game, we assume each game’s outcome is independent of previous games and simulate a single season by generating 82 random numbers between [0.0, 1.0], and assign wins to a game if the number is larger than 0.2. We made the independence assumption for simplicity’s sake because whether previous results would impact the current game is a question of its own. By doing so we can simulate n number of seasons, or trials, and calculate the relative frequency of seasons that have no consecutive losses, which is an estimate of the true probability we want to know. By the law of large numbers, as n grows bigger, this estimate will converge to the true probability. We implemented the simulation in Python.

We ran the simulations for increasing n, and observed that the simulations converged to an estimate of 0.059, rounded to three decimal places, as shown below.

