

1. Teams who lose in the wild card round of the playoffs have not lost their first three games of the following season since 1970. If the Indians lose the first two games of the 2018 season, how would you use this information to bet on the outcome of their third game?
2. Pip the probabilistic pitcher has a very systematic way of approaching a plate appearance. On the first pitch, he throws a fastball 75% of the time, and an off speed pitch 25% of the time. Every subsequent pitch's distribution is determined by the previous pitch; if the previous pitch was a fastball, he throws a fastball 50% of the time and an off speed pitch 50% of the time, but if the previous pitch was an off speed pitch, he throws a fastball 70% of the time and an off speed pitch 30% of the time. You sneeze and miss the first two pitches of a plate appearance with Pip pitching, but see that the third pitch is an off speed pitch. What is the probability that the first pitch was a fastball? Please provide enough detail to demonstrate how you got to your answer.
3. Suppose that half of MLB players have a true talent OBP (OBP means the probability of a player reaching base in a single plate appearance) of .300 and the other half have a true talent OBP of .340. You are told that Player A had a .340 OBP over the first 100 plate appearances of his season. If that is the only information you have about Player A, what do you think the probability is that his true talent OBP is .340? Please provide enough detail to demonstrate how you got to your answer.
4. With the hit tracking data provided by Statcast, we are provided measurements of exit velocity and launch angle for about 90% of balls in play (see here for more information <http://m.mlb.com/news/article/119234412/statcast-primer-baseball-will-never-be-the-same/>). These measurements are missing for the other 10% of balls in play. The missing balls tend to be hit at extremely high (popups) or low (chopped balls) launch angles. Because they are hit at extreme angles, the exit velocity for these missing balls tends to be lower than the average exit velocity of balls in play with hit data. To further complicate this, some ballparks miss balls more frequently than others. Given all this information, how would you design a system to calculate each batter's average exit velocity that properly handles balls with missing data?
5. The Assistant GM sends you the following email: "I came across this article and found it really interesting. I'd like to consider implementing the ideas suggested. Could you please read through the article, and respond with your thoughts on the author's methodology and what that means about the implications of the author's results?"
  - <https://www.fangraphs.com/blogs/are-early-adopters-of-the-uppercut-influencing-their-clubhouse-peers/>
  - <http://www.baseballprospectus.com/article.php?articleid=31512>
  - <https://www.fangraphs.com/blogs/robot-umps-and-velocity-incentives/>
  - <http://www.baseballprospectus.com/article.php?articleid=29358>