1. Calculate the probability of flipping a balanced coin four times and getting each pattern: HTTH, HHHH and TTHH.

All 16 combinations of four toss has the same probability: (½)(½)(½)(½) = 1/16.

2. If a list of people has 24 women and 21 men, then the probability of choosing a man from the list is 21/45. What is the probability of not choosing a man?

The probability of not choosing an man is 1-21/45 or 24/45.

3. The probability that Bernice will travel by plane sometime in the next year is 10%. The probability of a plane crash at any time is 0.005%. What is the probability that Bernice will be in a plane crash sometime in the next year?

P(travel and crash) = P(crash | travel)P(travel) = 5×10^{-6}

4. A data scientist wants to study the behavior of users on the company website. Each time a user clicks on a link on the website, there is a 5% chance that the user will be asked to complete a short survey about their behavior on the website. The data scientist uses the survey data to conclude that, on average, users spend 15 minutes surfing the company website before moving on to other things. What is wrong with this conclusion?

Assume that on the survey there is a question(s) asking how much time the respondent spends on the site from which the conclusion was derived. There is likely selection bias, since the respondents are self-selected and results are self-reported.