1. A particular flight can only fit 200 people, but tickets were sold to 205 people. Suppose each ticket holder has a .05 chance of not showing up for the flight.
   (a) What is the probability that the flight will be overbooked?
   (b) What is the expected number of people to show up?
   (c) What is the variance of the number of people who show?

2. Suppose you are flipping a coin with probability $p$ of Heads and probability $q = 1 - p$ of Tails.
   For each of the following, express your answer in terms of $q$: (a) What is the probability that the first Heads is strictly after the first $k$ tosses?
   (b) Now suppose that you are given that the first Heads did not appear in the first $k$ tosses, what is the probability that the first Heads appears strictly after the first $k + m$ tosses?

3. Suppose a pollster asks people on campus if they prefer candidate A or candidate B. Suppose he asks total of 75 people and 22 prefer candidate B. If $p$ is the true fraction of the population that prefers Candidate B, for what value of $p$ is our observation most likely?

4. What is the variance of the number of boxes of cereal you need to buy in order to collect all the toys from the “Coupon collector problem”?