1. Suppose you flip a fair coin 20 times.
   (a) What is the probability of flipping exactly 5, 10, 12 Heads?
   (b) What is the probability of flipping more Heads than Tails?
   (c) What is the probability that you do not flip two Heads nor two Tails in a row?
   *(d) What is the probability of flipping an even number of Heads? If we flipped $n$ times?
   **(e) What is the probability of flipping two or more Heads in a row?

2. Suppose we have an unfair 6-sided die. The die has been altered so that the number 5 is twice as likely to appear as any of the other five outcomes. What are the probabilities of each possible outcome?

3. Suppose a fair six sided die has been relabeled so that the sides read 1, 2, 3, 4, 5 and 5. (So there is no 6 but two 5s.) If the die is rolled 5 times, what is the probability that we roll five distinct values?

4. Ignore leap years and assume there are 365 distinct possible birthdays. Suppose we ask the birthday of $n$ people. Assume the probability of having any given birthday is equally likely. (Reference Example 2.7 of the text.)
   (a) What is the smallest value of $n$ such that the probability is at least .5 that at least two people share a birthday?
   *(b) Under the assumptions above, what is the smallest value of $n$ such that the probability is at least .5 that at least one person shares your birthday?

5. In an upcoming election, 30% of voters prefer candidate A, 20% prefer candidate B, and 50% have no preference.
   Suppose we ask 10 voters their preference equally likely at random. What is the probability that 3 will prefer candidate A, 2 will prefer candidate B and 5 will have no preference?