Exercises: Use R to solve the following

1. If password can consist of six letters, find the probability that a randomly chosen password will not have any repeated letters.

2. A sample of size 10 is chosen at random from a class of 100 consisting of 60 females and 40 males. Obtain the probability of getting 10 females.

3. A box with 15 IC chips contains 5 defective chips. If a sample of three chips is drawn at random (without replacement), what is the probability that all three are defective?

4. A batch of 50 semiconductors contains 10 that are defective.

   Two are selected at random without replacement.

   a) What is the probability that the first one selected is defective?
   b) What is the probability that the second one selected is defective?
   c) What is the probability that both are defective?
   d) How would the probability change in (b) if the chips selected were replaced before the next selection?

5. In a party of five students, compute the probability that at least two have the same birthday (month/day), assuming a 365-day year.

6. The probability that at least two students in a class have the same birthday is at least .75 ... What is the minimum size of the class?

7. Use R to simulate that the probability of getting a head is .5 if a fair coin is tossed repeatedly (1000 times).

8. Use R to simulate that the probability of getting an even number if a fair die is rolled repeatedly (600 times).

9. An experiment consists of tossing two fair coins. Use R to simulate this experiment 100 times and obtain the relative frequency of each possible outcome.

10. Amy and Jane are gambling against one another. A fair coin is tossed repeatedly. Each time a head comes up, Amy wins two euros from Jane, and each a tail comes up, Amy loses 2 euros to Jane. Use R to simulate this game 100 times.

    Estimate:
    a) the number of times that Amy is ahead in these 100-coin tosses
    b) how much Amy won or lost

11. A series of 20 jobs arrive at a computing center with 50 processors. Assume that each of the jobs is equally likely to go through any one of the processors.

Find the probability that a processor is used at least twice.