Random numbers are used in computer programs in games and simulations. In a card game, for example, the cards would be dealt in random order. In an adventure game, you would want the player to have a different experience each time they played the game. Random numbers are used in simulations for designing real-world systems, such as a new highway. Before a highway is built, it is typically modeled and simulated on a computer. Random number sequences are used to represent the expected behavior and frequency of automobiles, so designers can estimate the impact of adding another lane, for example.

We call these numbers **pseudorandom** because they are computed by a computer algorithm, so they are not truly random. This is because the outcome of an algorithm is determined by the algorithm’s steps. Knowing the steps tells you the next number. They appear to be random, but are not as random as, for example, tossing dice in real life.

**Random-number generation**

The Random class has several methods for generating random numbers. We will look at one of the two overloaded `nextInt` methods, `nextInt(int n)`.

1. import the Random class
   ```java
   import java.util.Random;
   ```

2. instantiate a Random object
   ```java
   Random rand = new Random();
   ```
3. call the nextInt method for each random number desired. If we give it an argument of type int, it will return an int in the range of 0 to the argument – 1. (this is a little unclear in the book)

    // for a number in the range 0 to 50
    rand.nextInt(51);

What if we want a number in a range starting > 0? first, the argument is 1 more than the high end desired, then subtract the low end of the range from the argument, then add it back to the total:

    // generates a number from 7 to 11:
    // subtract 12 – 7 = 5 (the argument)
    // then add 7 back to the number returned by the nextInt method
    int nNum = rand.nextInt(5) + 7;

This gives us 0 – 4, then add (for the low range) 0 + 7 = 7 and (for the high range) 4 + 7 = 11

    // generates a number from 1 to 52 (deck of cards)
    int nCard = rand.nextInt(52) + 1; // subtract 1 from 53, then add it back