

```

1  /**
2  * Return a double using a Poisson distribution, and
3  * change the internal state.
4  * @param expectedValue the mean of the distribution.
5  * @return the pseudorandom double.
6  */
7  public int poisson( double expectedValue )
8  {
9      double limit = Math.exp( -expectedValue );
10     double product = randomReal( );
11     int count;
12
13     for( count = 0; product > limit; count++ )
14         product *= randomReal( );
15
16     return count;
17 }

```

Figure 9.5 Generation of a random number according to the Poisson distribution

Another important nonuniform distribution is the *negative exponential distribution*, shown in Figure 9.6. This distribution has the same mean and variance. The negative exponential distribution is used to model the time between occurrences of random events, as in a simulation application shown in Section 13.2.

Many other distributions are common. The main purpose here is to show that most can be generated from the uniform distribution. Consult any book on probability and statistics to find out more about these distributions.

The *negative exponential distribution* has the same mean and variance. It is used to model the time between occurrences of random events.

```

1  /**
2  * Return an int using a negative exponential
3  * distribution, and change the internal state.
4  * @param expectedValue the mean of the distribution.
5  * @return the pseudorandom int.
6  */
7  public double negExp( double expectedValue )
8  {
9      return - expectedValue * Math.log( randomReal( ) );
10 }

```

Figure 9.6 Generation of a random number according to the negative exponential distribution