

Random Numbers in Java

The Random class

Random numbers can be generated using objects of type `Random`. Actually, the returned values are chosen pseudorandomly with an approximately uniform distribution in a specified range. Integer values can be generated using the `nextInt` method. For example, `nextInt(100)` returns a pseudorandom, uniformly distributed integer value between 0 (inclusive) and the specified value (exclusive), drawn from this random number generator's sequence. If you want a random number from a range not starting with zero, you need to shift the range

For example, the below code generates two random integers between 1 and 100 (inclusive).

```
import java.util.Random;
public class TwoNumbers {

    public static void main(String[] args) {
        Random rand = new Random();
        int one = rand.nextInt(100) + 1;
        int two = rand.nextInt(100) + 1;
    }
}
```

The `Random` class can also be used to generate random values for other data types using methods such as `nextBoolean`, `nextFloat`, and `nextDouble`. See the Java documentation for details (<http://docs.oracle.com/javase/7/docs/api/>).

The `Math.random()` method

Random numbers can also be generated using the `Math.random` method. This method returns a positive random number of type `double` greater than or equal to 0.0 and less than 1.0. Note: as with the `Random` class, the returned values are chosen pseudorandomly with an approximately uniform distribution in that range.

Although, `random()` returns a `double`, we can make random integers within a range by specifying the beginning and ending numbers of the range and “casting” the `double` value to an `int` value. Casting refers to the process of converting a data item of one type to another type.

To cast a value to a different type we apply the cast operator to that value. In the following example, we cast a value of type `double` to type `int`. In this case, everything after the decimal point is truncated; we do not round to the nearest integer.

```
double x = 3.14;
int n = (int) x; // n will become 3
```

We can use casting to help us generate a random integer in a specific range. For example, if we want a random integer between 1 and 6 (inclusive), we can use the following code:

```
1 + (int) (Math.random() * 6);
```