

Random Number Generation Demonstration (Version 2.0)
BE-104, Fall '05, Dr. C. S. Tritt

```
/* ...Snip (to save space)...
 */
import java.io.*;
import java.util.*;

public class RanTest {

    public static void main(String[] args) throws FileNotFoundException {

        // Create & seed random number generator.
        //     Alternative ways...

        Random seq = new Random(1); // Specified seed.
        // Random seq = new Random(); // Arbitrary seed.
        // Random seq = new Random(System.nanoTime()); // Use system clock.

        // Use arrays from Chap. 10 to hold counts.

        int uniformCount[] = new int[20];
        int normalCount[] = new int[20];

        // Variables to hold random values.

        int uniform; // 0 to 19 uniformly distributed.
        int normal; // Normaly distributed, mean 10, sd 3.

        // Generate and total random values.

        for (int i = 0; i < 10000; i++) {

            uniform = (int)(20.*seq.nextDouble());
            uniformCount[uniform]++;

            normal = (int) (10. + 3.*seq.nextGaussian());
            if (normal < 0) normal = 0; // Limit range.
            if (normal > 19) normal = 19; // Limit range.
            normalCount[normal]++;

        }

        // Write results to a text file.
        //     File I/O like Chap. 12 (but not exactly).

        Formatter outFile = new Formatter("output.txt");
        outFile.format("  Uniform      Normal\n");

        for (int i = 0; i < 20; i++)
            outFile.format("%6d      %6d\n", uniformCount[i], normalCount[i]);
        outFile.close();

        System.out.println("Done."); // Let user know it worked.
    }
}
```

Program Output and Importing Data into Excel

The RanTest program produces the following output file (only a portion shown).

```
Uniform      Normal
525          13
471          30
...snip...
492          25
484          22
```

This file can be imported into Excel for analysis and plotting. To import the file, run Excel and select Data | Import External Data | Import Data... and specify the file name and type (Text Files). This will start the “Text Import Wizard” that allows you to specify how to import the data. Once imported, the data can be plotted as shown in Figure 1.

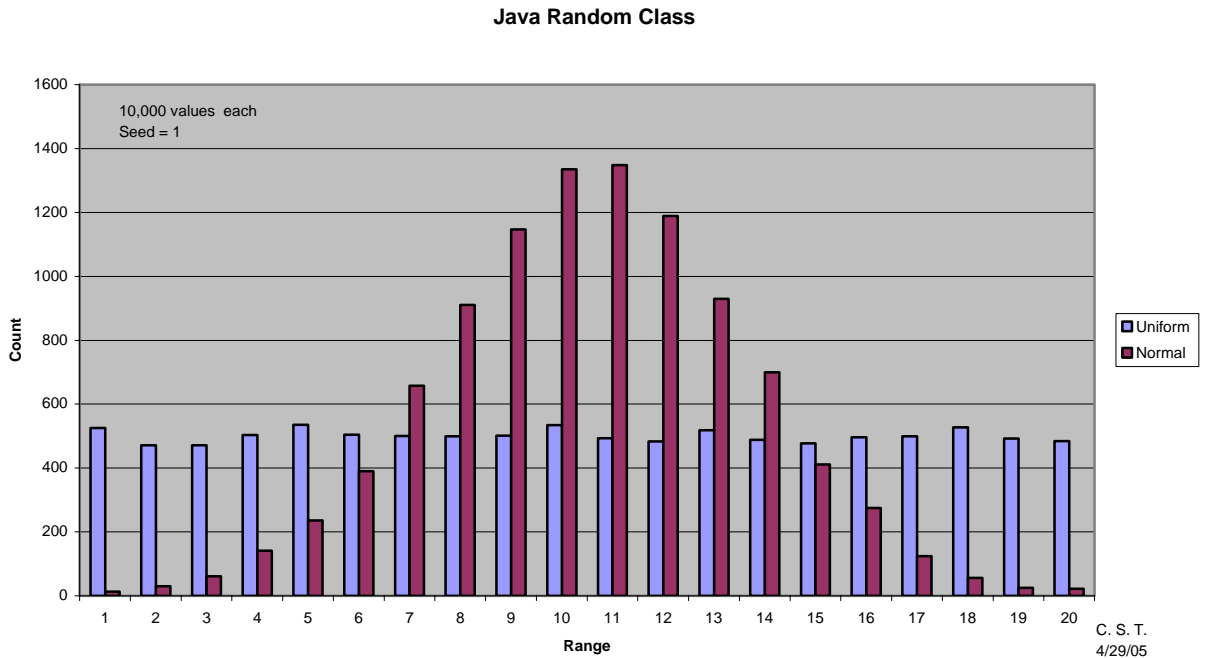


Figure 1: Histogram showing RanTest (Random test) program output.