

## Lab - Random Numbers

### Q1.

Write a Java program to print three random numbers between 0 and 1 using `Math.random()`. Run it twice. Is the output the same?

### Q2.

Write a Java program to print three random numbers between 0 and 1 using `java.util.Random`. Run it twice. Is the output the same? How do you make the output the same?

### Q3.

Write a Java program using `java.util.Random` to print

- A random integer
- A random double between 0 and 1.
- A random integer between 0 and 100

### Q4.

Write a Java program using `java.security.SecureRandom` to print

- a random integer between 0 and 1000
- a 20 byte seed value obtained from `SecureRandom`

Use `Hex.encodeHexString()` in the Apache Commons Codec Library (<http://commons.apache.org/codec/>) to print the Hex representation of this seed.

### Q5.

Set the seed on your instance of `java.security.SecureRandom`. Does this give the same random numbers each time you run the program? Why? Read the documentation on `setSeed()`.

### Q6.

Complete the following Java program to implement a Linear Congruential Generator which generates and prints out 20 pseudo random numbers.

```
// parameter values
int seed = 5;
int mod = 7;
int multiplier = 3;
int inc = 3;

int prev = seed ;
```

### Q7.

Write a Java program to print the list of SecureRandom providers on Windows. Also print out the default algorithm for SecureRandom.