

Assignment 1

In this Assignment you are going to work on a call center simulation.

The inter-arrival times of calls are exponentially distributed with mean 4.5 min. The service time of the server is Normal distributed with mean 3.2 minutes and standard deviation 0.6 minutes. When the server is busy the customers are put on hold (they wait in a FCFS queue). If a customer waits more than a time that is Uniformly distributed between 10 and 30 minutes without starting service s/he hangs up (and leaves the waiting queue. This phenomenon is known as *reneging*.)

Simulate this system for 1000 and 5000 calls separately. You should use the [Java code for the single channel queue](#) to base your own code. It should be sufficient to modify the code in Sim.java only. Collect and report statistics on: Server Utilization, Average Waiting Time in the Queue, and Total Number of Customers that reneged.

The following function generates Uniform random variates between MinPatience and MaxPatience:

```
public static double uniform(Random rng, int MinPatience, int MaxPatience) {  
    return((MaxPatience-MinPatience)*rng.nextDouble()+MinPatience );  
}
```

Requirements for your program are:

1. Seed for the random number generator should be read from the command line as the first argument, total number of calls should be read as the second argument.
2. It should be executed from the command line as follows (We will test your program using this method. Make sure it works from the command line):

```
java Sim 12345 5000
```

You should submit a **single zipped file** (not larger than 5MB) through this interface that contains:

- A **well written report** about your definition of events, simulation logic, simulation outputs, your observations and interpretation of results,
- Java codes including class files.