# Project based on Homework 2

November 1, 2010

The homework 2 problem can be further extended to include cases with different $N, \lambda, \alpha$ and $\rho$. This can become a project. Here are some guidelines:

1. Consider the solution of the problem for $N = 3, 4, 5, \ldots 10$ for the three different loads we had in the homework
2. Answer all the questions of the homework for all different $N$ values
3. For specific overflow probabilities (such as 0.01, 0.001, 0.0001 etc.) find out the required buffer size (using $G(x)$) and verify that for a given load the buffer gets smaller as $N$ increases i.e. demonstrate the statistical multiplexing effect. You may plot the required buffer size for a given load as a function of N!
4. You may create a Matlab code that can accept $N, \lambda, \alpha$ and $\rho$ and produce the necessary matrices, probability functions, probability loss formulas, eigenvalues, as well as plots of the loss probability etc. based on your experience from the previous questions.
5. It will be nice if you can do an actual simulation and compare your results with the mathematical derivations. This part is more demanding and is left as optional.

You may wish to use Matlab for your calculations. Feel free to collaborate.
Your report should include your code with enough documentation.
Please bring the project by October 20 2010!