Computer Networks I
Programming Assignment 1

Due: September 20, 2017

Overview

You are to write a program which takes as inputs (1) the bandwidth of the link, (2) the bandwidth requirement of each user, (3) the total number of users n, (4) the probability that any particular user is idle at a given time p, and (5) a "target" number of users x; in return, it should output the probability that x or more users are online at any time.

Requirements

- Use either C or C++ for this assignment.
- Your code must compile and run on the machines in the CS department labs.
- Code should be well-documented and modular, and must follow the `.h`/`.c` standards and naming conventions discussed in class.
- Include a Readme which describes how to use your program, and a Makefile to compile your code.
- You will have to compute factorials and binomial coefficients of relatively large numbers. You must implement your own methods for dealing with the large integers in these computations.
- You should be able to handle values of n up to at least 100.
- Do not use any external libraries in your implementation (only the standard libraries).
- You should check your results against another calculator which solves this problem correctly. If there is a margin of error, you must explain why it exists and rationalize that it is acceptable in your Readme.
- You are to submit a tarball (.tar, .tgz) to Canvas including your code, the Readme, and the Makefile. Name the file using your own full name and the suffix `_Assignment1` (e.g. `JayMisra_Assignment1.tgz`).
- Do not include the executable in your submission.
- The assignment is to be completed individually, not in groups.