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cs484

PROJECT 1

I noticed that problems 8 and 9 for chapter 1 strongly resemble this project's description. I used the solution for #9B as my formula for computing the probability that x or more users are online at any time. However, I subtract the probability that any user is idle at a given time from 1 to obtain the probability that any user is online at a given time. I use this to manually compute the binomial coefficient, as well as the probable success and failure values. I moved all of those calculations into a for loop that acts as the summation for the equation. The summed value is my found probability.

I found out that recursion was much too slow for figuring out the binary coefficient. I remembered that from my Data Structures class, we needed to find factorials iteratively in order to calculate factorials of very large numbers (as long as they were in a quotient with other factorials). I found a stack overflow question where an answer described how to calculate binomial coefficients iteratively, and adapted it to use extremely large data types to handle the large integers.

This is the equation that I used for my calculation:

$$\sum_{n=N+1}^M \binom{M}{n} p^n (1-p)^{M-n}$$

It was retrieved from the solution manual for the textbook (but is also available here: <https://www.studykorner.org/computer-networking-a-top-down-approach-6th-edition-solutions-to-review-questions-and-problems/>).