

# CSE 421 Spring 2025: Final

Instructor: Chinmay Nirkhe

Date: June 12th, 2025 2:30-4:25pm

**Instructions:** You are allowed to bring one 8.5 x 11 piece of paper (double sided) of notes to the exam. It must be printed, and no electronics are allowed. The exam is on pen and paper and you are to write in this exam booklet. Ample space is provided for your solutions. If you need more, use blank 8.5×11-inch sheets of paper. Write your name at the top of each sheet, indicate the problem number, and staple the pages to the back of your exam.

Unlike problem sets, each problem will be broken down into subparts in which you are asked to *either* give the algorithm description, proof of correctness, or state and prove the runtime. Only answer what is asked of you. For an algorithmic question, if no specific runtime is provided in the question, find as efficient an algorithm as you can. If a specific runtime is required and you cannot achieve it, you may submit a solution with a weaker runtime.

The exam consists of a combination of short-answer and long-answer questions, worth a total of **100 points**. We anticipate that the later problems will take you longer than the earlier problems.

It is important that your work be **legibly handwritten** in clear technical English. Full sentences are not explicitly required but highly suggested. Length in a proof (as in other writing) is not a virtue. You can supplement (but not replace) your technical English description of an algorithm with pseudocode, if you feel that that helps resolve ambiguities. If it is hard for us to read your work we will reluctantly deduct points. Mathematically rigorous solutions are expected for all problems unless explicitly stated.

In case pages get separated by accident, we advise you to write your name on the top of each page.

Name: \_\_\_\_\_

SID & Email address: \_\_\_\_\_

Names of your adjacent test takers: \_\_\_\_\_