The final will cover all material covered in lectures, handouts, homeworks and readings. More weight will be placed on topics that haven't been tested yet. You should look over all homework problems and the review problems suggested for previous tests. In addition, here are a few problems to try as review. As usual, there are many more problems in the textbook to try on your own, as well as a few problems with solutions in each chapter.

**Greedy Algorithms:** Problem 4.8.

**Dynamic Programming:** Problem 6.6.

**Network Flow:** Problem 7.23.

**NP-Completeness:** Consider coloring the vertices of a graph with \( k \) colors. We would like to make sure that no edge has both end points assigned the same color. When this happens, we can think of this as a “mistake”. So the problem 3-COLORING asks whether or not a graph can be 3 colored with 0 mistakes. We have seen that this problem is NP-Complete. But maybe we want to allow a small number of mistakes. Prove that for any fixed constant \( k \), deciding whether a graph \( G \) can be 4 colored with at most \( k \) mistakes is NP-Complete.

**Special Cases of Hard Problems:** Problem 10.5a

**Approximation Algorithms:** Problems 11.7 and 11.8.

**Randomized Algorithms:** Problems 13.1 and 13.10.