

This homework covers hashables, heaps, and fundamental algorithms (sorting, searching, selection, hashing). It also revisits some data structures and applications of data structures previously covered. It is due in class Wednesday, February 25.

See the Policies page on the course website for information about revise-and-resubmit, late work, and academic integrity as it applies to homework.

Write your solutions carefully — your work should be neat, readable, and organized.

1. Do the homework #4 drill problems on Canvas. (Look for `hw4 drill` in the Quizzes section.)
2. ADM 3-28, page 105.
3. ADM 4-7, page 141. Also give the running time of your algorithm.
4. ADM 4-13, page 142. Also explain why your algorithm achieves the required running time.
5. ADM 4-19, page 142. Assume the standard implementation of a heap (using an array). As part of your answer, explain how each operation would be carried out in a max heap and in a sorted array. For (b), consider both if you know where the element to be deleted is (you know what slot it is in) and if you don't and have to find it first.
6. ADM 4-41, page 145. The expected value for something with more than one possible outcome is the weighted average of those outcomes. For example, if in a certain game you have a 30% chance of winning \$10 and a 70% chance of winning nothing, the expected winnings would be $0.3(10) + 0.7(0) = \$3$.