CS 332: Algorithms
Homework #3

Assigned: Friday, February 08

Due: Wednesday, February 13 (Note: the day of our first exam)

1. Exercise 9.3-1 (10.3-1 in old book). You must prove your answer for the 7-element case, but you can argue it informally in the 3-element case (since a rigorous proof is a bit difficult).


3. Exercise 8.1-3 (9.1-3) Hint: Consider the height of the decision tree, and use the same argument as the proof of theorem 8.1.

4. (9.1-4 in old book, not in the new book): Professor Solomon claims that the \(\Omega(n \lg n)\) lower bound for sorting \(n\) numbers does not apply to his machine, in which the control flow of a program can split three ways after a single comparison \(a_i : a_j\), according to whether \(a_i < a_j\), \(a_i = a_j\), or \(a_i > a_j\). Show that the professor is wrong by proving that the number of three-way comparisons required to sort \(n\) elements is still \(\Omega(n \lg n)\).