17.1-2 Suppose that we have a set of activities to schedule among a large number of lecture halls. We wish to schedule all the activities using as few lecture halls as possible. Give an efficient greedy algorithm to determine which activity should use which lecture hall.

(This is also known as the **interval-graph coloring problem**. We can create an interval graph whose vertices are the given activities and whose edges connect incompatible activities. The smallest number of colors required to color every vertex so that no two adjacent vertices are given the same color corresponds to finding the fewest lecture halls needed to schedule all of the given activities.)

17.3-4 Prove that for an optimal code, if the characters are ordered so that their frequencies are nonincreasing, then their codeword lengths are nondecreasing.