1. There are n student workers at the library, each of whom performs a daily shift defined by a start time and a a finish time. You must select a subset of these workers to be supervisors, such that every worker's shift overlaps, at least partially, with the shift of a supervisor. Design a greedy algorithm to select the minimum possible number of supervisors, and prove your algorithm's correctness.

2. You are given the locations of n houses $(h_1, h_2, ..., h_n)$ and n power stations $(p_1, p_2, ..., p_n)$ along a straight line (for simplicity, you may assume that both lists are already in sorted order, and that all values are distinct). Each house must be connected to exactly one power station, and vice versa. Your goal is to minimize the length of the longest connection.

   Consider the following greedy strategies. Prove or disprove whether each will yield an optimal solution.

   (a) Connect the closest house and power station. Repeat with the remaining houses and power stations.

   (b) Connect the leftmost house to the leftmost power station. Repeat with the remaining houses and power stations.

   (c) Connect the leftmost house to its nearest power station. Repeat with the remaining houses and power stations.

   Hint: To help you prove correctness, think of each possible solution as an **ordering** of the houses. The first house in the ordering is the one that connects to p_1, the second house is the one that connects to p_2, and so on.