1. Consider the Quick Sort algorithm that always chooses the first number as its pivot.

   (a) (5 points) Describe an input of size \( n \) that makes the algorithm to achieve the \( \Theta(n^2) \) time bound.

   (b) (5 points) Describe an input of size \( n \) that makes the algorithm to achieve the \( O(n \log n) \) time bound.

2. (10 points) Suppose that you have an array of \( n \) elements, containing three distinct keys: true, false, maybe. Give an \( O(n) \) algorithm to rearrange the list so that all false elements precede maybe elements, which in turn precede true elements. You may use only constant extra space.