1. For a set of integers, design an algorithm to find all the subsets, with all its three elements, summing up to 0. Analyze its time and space complexity.

2. Suppose there are many pieces of wood. They are identical in the density and texture. We ignite one piece of wood at one of its end (like its right end), and it takes 1 hour for the fire to reach another end (left end). The question is how to identify 45 minutes only by burning these wood.

3. Given a sorted linked list, delete all nodes that have duplicate numbers, leaving only distinct numbers from the original list.

E.g. Input: 1->2->3->3->4->4->5 Output: 1->2->5

Input: 1->1->1->2->3 Output: 2->3

4. For a sequence of $mn+1$ natural numbers. Prove that there is either a non-decreasing subsequence of $n+1$ numbers, or a non-increasing subsequence of $m+1$ numbers.