1. Given an array of real numbers $A[1..n]$, find a contiguous sub-array $A[i..j]$, $1 \leq i \leq j \leq n$, with the largest sum. Note that the array might contain both positive and negative numbers. [Hint: Dynamic Programming (or similar)]

2. An array of integers (positive and negative) is given, each having at most $K$ bits (plus the sign bit), and it is known that the sum of all the integers in the array also has at most $K$ bits (plus the sign bit). Design an algorithm that computes the sum of integers in the array, with all intermediate sums also having at most $K$ bits (plus the sign bit). [Hint: find in what order you should add positive and negative numbers].

3. Given two arrays of integers, how can you efficiently find out if the two arrays have an element in common?

4. Given a singly linked list, determine whether it contains a loop or not, without making any modifications to the list, and without using any additional storage space. [Hint: advance pointers, one faster than the other…] .

5. (Microsoft) Given an array $A[1..100]$ which contains all natural numbers between 1 and 99, design an algorithm that runs in $O(n)$ and returns the duplicated value.