Algorithms

1. Give an algorithm
   - which finds a maximum in a list of integers;
   - which finds the arithmetic average of \( n \) integers;
   - which counts the number of \( A \)'s in a string;
   - which counts the number of \( A \)'s \( C \)'s \( G \)'s and \( T \)'s in a string over an alphabet \( A, C, G, T \);
   - which finds the first occurrence of a substring \( AAA \);
   - which checks if a string is a palindrome;
   - which finds if a string \( s \) is a substring of a string \( t \);
   - which finds if a string \( s \) is a subsequence of a string \( t \).

2. Give a "big Oh" estimate for the worst-case complexity of each algorithm from 1.