

AlgoLab 1

1. Let $p(x)$ be a polynomial of degree n . Write a C or C++ program for Horner's rule to calculate the value of the polynomial. (CLRS 39)
2. Given is a fixed, ordered (by \leq) array $b[0 : n - 1]$, where $n > 0$. A plateau of the array is a sequence of equal values. Write a program to find the length of longest plateau of $b[0 : n - 1]$.
3. Given a set S of n integers and another integer x . Write a C or C++ program for a $\theta(n \lg n)$ time algorithm that determines whether or not there exist two elements in S whose sum is exactly x .
4. Given a set S of n integers, write a C or C++ program to find two integers which are closest. For example $\{20, 1, 100, 13, 16, 2, 5, 7\}$, closest pair is $\{1, 2\}$. Hint: first sort.

Note: Find the time complexity of all above algorithms.