

Homework Assignment Set 5

Both problems have been adopted from the notes and hand outs of the Algorithm course instructed by Prof. Abhijit Das, Dept. Of CSE, IIT Kharagpur

I would like to thank Prof. Abhijit Das

Q1. (a) Analyse the average case performance of linear search algorithm if exactly half the time element x is not in the list and if x is in the list it equally likely to be in any position.

(b) An algorithm is called optimal for the solution of a problem if there is no algorithm for solving the problem using fewer operations.

Is the linear search algorithm optimal with respect to the number of comparisons of integers (not including the comparisons for book keeping in the loop).

Q2. Consider the following modification of binary search algorithm. Let a_0, a_1, \dots, a_n be sorted sequence of integers. In order to determine if an integer a occurs in the list, divide the list in three parts of nearly equal size and determine i which part a may be locate. Then divide this potential part into three sub parts and so on. Since this search uses three way branching, it is called ternary search.

(a) Write details of the ternary search algorithms

(b) Compute the worst case time complexity of the ternary search algorithm

(c) If you are asked to choose between binary and ternary search, which would you prefer and why?
