

LAB MANUAL
On
Algorithms Laboratory
For MCA 4th Semester of VTU

Instructions to the Readers:

1. This document is a useful material for the 4th Semester MCA students (2013 Scheme – 13MCA46) of Visvesvaraya Technological University, Belagavi, Karnataka.
2. Though these programs are compiled and verified on Turbo C compiler, they can be executed on different C compilers with little/no modifications.
3. Additional explanation for the program is provided, wherever necessary. However, it is advised to know the theory concepts by referring to the respective subject notes (available in the website).
4. Clarifications/suggestions are welcome!!

1. **Implement recursive Binary Search and Linear Search. Determine the time required to search an element. Repeat the experiment for different values of n , the number of elements in the list to be searched and plot a graph of the time taken versus n .**

Explanation:

Functions for linear search and binary search have been developed. But, as binary search requires sorted elements, a function for sorting the elements also has been included in this program.

To compute the time taken by the algorithm, we make use of built-in data type `clock_t` which is available in the header file `time.h`. Two variables of type `clock_t` are required to get the starting time and ending time of the algorithm. The built-in function `clock()` gives the current time of the system in terms of *number of clock-ticks*. So, to compute the time elapsed for the working of an algorithm, the different between starting time and ending time has to be considered and it must be divided by `CLK_TCK`.

As the processors are very fast, the time computed will be negligibly small and hence it may result in zero always. Hence, a *delay* is enforced wherever the basic operation is expected to execute.

Normally, time complexity can be better understood with a huge value of input size. Hence, instead of reading the array elements from the keyboard, it is suggested to generate random numbers.

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