

Objective:

- To understand and implement basic searching algorithms.
- To analyze the differences between linear and binary search in terms of efficiency.
- To understand how the data structure (sorted vs. unsorted) affects search performance.

Instructions:

Implement the following searching algorithms in C. Use appropriate data structures and techniques to demonstrate the working of each algorithm and analyze their performance.

Assignment Tasks

Assignment 1st: Linear Search Implementation

Definition: Linear search is a simple searching algorithm that checks each element in the list sequentially until the desired element is found or the end of the list is reached.

Tasks:

- Write a C program to implement linear search.
- The program should take an array and a target value as inputs and search for the target within the array.
- Display the index where the target value is found, or indicate if it is not present.

Testing: Use an example array of unsorted elements to demonstrate the search process.

Assignment 2nd: Binary Search Implementation

Definition: Binary search is a highly efficient searching algorithm that only works on sorted arrays. It divides the search interval in half repeatedly to locate the target value.

Tasks:

- Write a C program to implement binary search.
- The program should prompt the user to enter a sorted array and a target value.
- Display the index where the target value is found, or indicate if it is not present.

Testing: Use a sorted example array to demonstrate the search process and show each step as the interval is divided.

Instructions for Submission

1. Implement the above tasks in C, ensuring each function works as expected.

2. Capture the output for each function (tree traversal and heap sort).
3. Document each step and observation.
4. Submit a PDF containing the following:
 - C Code: Include all implemented code sections.
 - Output Screenshots: Attach screenshots of the code output for each function.
 - Explanation: Provide explanations for each step of the code, including observations and results.