National University of Computer and Emerging Sciences

Laboratory Manual #2

for

Data Structures Lab

(CL 2001)

Department of Computer Science
FAST-NU, Lahore, Pakistan

Introduction

Objectives

After performing this lab, students shall be able to:

- Ordered Array ADT and Unordered Array ADT
- Time Complexity Calculations.

Problems

Part 1:

Ordered Array ADT short Questions:

Insertion Complexity: What is the time complexity for inserting an element into an ordered array? Write time complexity occurs.

Describe the algorithm for binary search in an ordered array. What is its time complexity?

Search in Ordered vs. Unordered: Compare the time complexity of searching for an element in an ordered array to that in an unordered array. When is it more advantageous to use an ordered array for searching?

Unordered Array ADT short Questions:

Insertion in Unordered Array: What is the time complexity for inserting an element into an unordered array? Write time complexity occurs.

Linear Search: How does linear search work in an unordered array? What is the time complexity for linear search?

Part 1:

Question#1:

Write a function to sort array elements using bubble sort. Also write the time complexity of complete code.

[64, 34, 25, 12, 22, 11, 90]

Question#2:

Write a function to sort array elements using insertion sort. Also write the time complexity of complete code.

[64, 34, 25, 12, 22, 11, 90]

Question#3:

Write a function to sort array elements using selection sort. Also write the time complexity of complete code.

[64, 34, 25, 12, 22, 11, 90]

Question#4:

Write a function that takes an input from user then search that element from the given vector using binary search. Also write the time complexity of complete code.

[64, 34, 25, 12, 22, 11, 90]