**S.Y. B. Tech. Academic Year 2022\_23 Trimester: III**

**Fundamentals of Data Structures**

**LABORATORY WRITE UP**

###### Experiment Number: 03

### **TITLE: Searching and sorting**

**PROBLEM STATEMENT**:

Write a C program to create a student database using an array of structures. Apply searching (Linear and Binary Search) and sorting techniques(Insertion Sort, Selection Sort, Shell sort).

**OBJECTIVE:**

1. To understand use of an array of structures for maintaining records
2. To implement, analyze and compare linear and binary search.
3. To implement, analyze and compare selection, insertion sort and shell sort.

**THEORY: *//To be Written by Students***

***// Write theory by elaborating below points***

* Searching (Explain with example)
  + Linear search
  + Binary search
* Sorting (Explain with passes)
  + Selection
  + Insertion
  + Shell

**IMPLEMENTATION:**

* **PLATFORM:** 
  + 64-bit Open source Linux or its derivatives.
  + Open Source C Programming tool like gcc/Eclipse Editor.
* **TEST CONDITIONS:-**

1.Input at least five records.

2.Search roll no which is not present using linear search and binary search

3.Search roll no which is present at different locations using linear search and binary search.

4.Test three sorting methods for at least five records.

* **PSEUDO CODE: *//To be Written by Students***

Write pseudocode for Linear Search, Binary search, Bubble, Selection and Insertion sort.

* **TIME COMPLEXITY: *//To be Written by Students***

Find out time complexity of above operations

* **CONCLUSION:**

Thus, implemented different searching and sorting methods on the student database. This System is able to perform searching and sorting under different cases.

* **FAQs *//To be Written by Students***

1. What is the meaning of database? How to maintain in C

2. What are the applications of searching and sorting?

3. Compare and contrast linear search and binary search?

4. Compare and contrast bubble,selection,insertion sort and shell sort?

* **PRACTICE ASSIGNMENTS**

###### Write a program to insert a new record into existing record

###### Write a program to delete a record from existing record

1. Write a program for bubble sort whose best case time complexity is O(n).