

10B17CI271: Data Structures and Computer Programming Lab

Course Credit: 2

Semester: II

Objective:

The objectives are to study

- Develop problem solving ability using Programming.
- Develop ability to design and analyze algorithms.
- Introduce students to data abstraction and fundamental data structures.
- Develop ability to design and evaluate Abstract Data Types and data structures.
- Apply data structure concepts to various examples and real life applications

Learning Outcomes:

The course will use hands on practice and applying the knowledge gained in theory course to different day to day real world applications.

List of Experiments

S NO	Topics
1	Getting acquainted with Arrays and Strings, Structures, Recursion, Pointers and Dynamic memory allocation
2	Operations on Linear Linked List, Doubly and Circular Linked List (Creation, insertion, deletion, sorting, traversing, reversing etc)
3	Operations on Stacks (Creation; pushing; popping; testing underflow, overflow; prefix and postfix)
4	Operations on Queues (Creation; enqueue; dequeue; testing underflow, overflow)
5	Operations on Tree or BST (Creation; Traversing like pre-order, post-order and in-order; Searching element; finding height etc.)
6	Implementation of Insertion Sort and Selection Sort Algorithm with arrays using dynamic memory allocation.
7	Implementation of Bubble Sort and Merge Sort Algorithm with arrays using dynamic memory allocation.
8	Implementation of Radix Sort and Quick Sort Algorithm with arrays using dynamic memory allocation.
9	Operation on Heaps and Heap Sort
10	Implementation of Linear Search Algorithm and Binary Search Algorithm using dynamic memory allocation.
11	Operations on Graphs (Creation; entering info; printing Output and deleting; traversal of BFS and DFS algorithm etc.)

References

1. Langsam, Augenstein, Tenenbaum : Data Structures using C and C++, 2nd Edn, 2000,
2. Horowitz and Sahani : Fundamental of Data Structures in C, 2nd Edn, 2008
3. Weiss : Data Structures and Algorithm Analysis in C/C++, 3rd Edn, 2006
4. Sahani : Data Structures, Algorithms and applications in C++, 1997.
5. Corman et al : Introduction to Algorithms, 3rd Edn., 2009

Evaluation Scheme:

1. Mid Term Exam (Viva and Written Exam)	20	
2. End term Exam (Viva and Written Exam)	5	30
3. Lab Records	5	
4. Regular Assessment (Quality and quantity of experiment performed, Learning laboratory skills, Attendance etc.)	30	
5. Project		15

Total	100	
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