

**UNIVERSITY OF MADRAS**  
**BACHELOR OF COMPUTER APPLICATIONS (B.C.A.)**  
**SYLLABUS WITH EFFECT FROM 2020-2021**

**BCA-DSC08**

**CORE-VIII: PRACTICAL - III**  
**DATA STRUCTURES USING JAVA LAB**

**II YEAR / III SEM**

**OBJECTIVES:**

- To implement linear and non-linear data structures
- To understand the different operations of search trees
- To implement graph traversal algorithms
- To get familiarized to sorting and searching algorithms

**OUTCOMES:**

- Write functions to implement linear and non-linear data structure operations.
- Suggest appropriate linear and non-linear data structure operations for solving a given problem.
- Analyze various sorting methods.

**LIST OF EXERCISES:**

1. Write a Java programs to implement the List ADT using arrays and linked lists.
2. Write a Java programs to implement the following using a singly linked list. Stack ADT  
(b) Queue ADT
3. Write a java program that reads an infix expression, converts the expression to postfix form and then evaluates the postfix expression (use stack ADT).
4. Write a Java program to implement priority queue ADT.
5. Write a Java program to perform the following operations:
  - (a) Insert an element into a binary search tree.
  - (b) Delete an element from a binary search tree.
  - (c) Search for a key element in a binary search tree.
6. Write a Java program to perform the following operations
  - (a) Insertion into an AVL-tree
  - (b) Deletion from an AVL-tree
7. Write a Java programs for the implementation of BFS for a given graph.
8. Write a Java programs for the implementation of DFS for a given graph.
9. Write a Java programs for implementing the following searching methods:
  - (a) Linear search
  - (b) Binary search.
10. Write a Java programs for implementing the following sorting methods:
  - (a) Bubble sort
  - (b) Selection sort
  - (c) Insertion sort
  - (d) Radix sort.