LAB REPORT OF

ADVANCE DATA STRUCTURES AND ALGORITHMS

(CSBM 502)

A report submitted in partial fulfillment of the requirements for the award of the degree of

# MASTER OF TECHNOLOGY

in

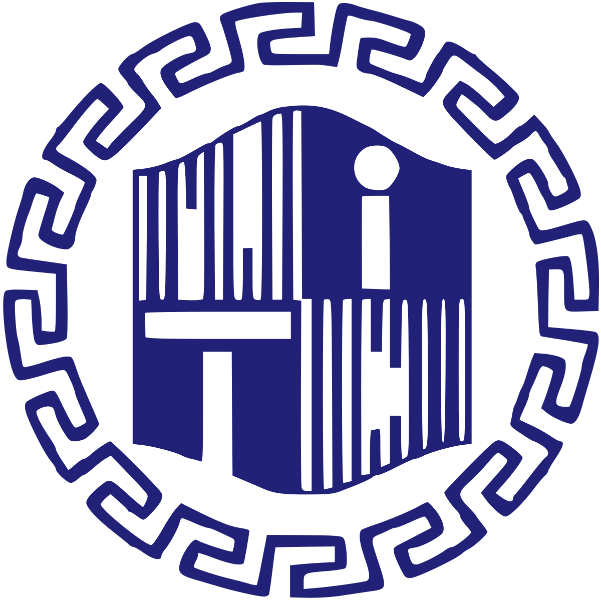
# COMPUTER SCIENCE AND ENGINEERING (ANALYTICS)

Submitted By

# AKSHAT KUMAR (242211003)

Submitted To

# DR. SAHIL (ASSISTANT PROFESSOR, DoCSE)

****

**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**NATIONAL INSTITUTE OF TECHNOLOGY DELHI**

**JUNE 2025**

# Table of Contents

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sr. No. | Experiment Title | | Page No. | Remarks |
| **1.** | **Implementation and analysis of Arrays and their operations.** | | 1.1 |  |
|  | Tasks: |  |  |  |
|  | T-1.1  T-1.2  T-1.3  T-1.4  T-1.5 | Insertion  Deletion  Searching  Traversing  Updation |  |  |
| **2.** | **Implementation and analysis of Linked Lists and their operations.**  Tasks: | |  |  |
|  | T-2.1 | Singly Linked List  2.1.1 Insertion a new node  2.1.2 Deletion of a node  2.1.3 Traversing | 2.1 |  |
|  | T-2.2 | Doubly Linked List  2.2.1 Insertion a new node  2.2.2 Deletion of a node  2.2.3 Traversing |  |  |
|  | T-2.3 | Circular Linked List  2.3.1 Insertion a new node  2.3.2 Deletion of a node  2.3.3 Traversing |  |  |
| **3.** | **Compare Arrays with Linked Lists and analyze their performance in different scenarios.** | |  |  |
| **4.** | **Implementation and analysis of Graph based single source shortest distance algorithms.**  Task: | |  |  |
|  | T-4.1  T-4.2  T-4.3  T-4.4  T-4.5 | Breadth first search  Depth first search  Dijkstra’s algorithm  Topological Sort  Floyd–Warshall algorithm | 2.1 |  |
| **5.** | **Implementation and analysis of Priority Queues using arrays, linked list and heaps.** | |  |  |
| **6.** | **Analyze the applications aspects of Skip Lists and compare with basic data structures.** | |  |  |
| **7.** | **Analyze the applications aspects of Splay Trees and compare with basic data structures.** | |  |  |
|  |  | |  |  |