Data Structures and Algorithms

Exercise 4:

Employee Management System

This project implements an Employee Management System using Java and arrays to store employee records. It demonstrates how to efficiently add, search, traverse, and delete employee data using array-based operations. Here's a detailed explanation:

Step 1: Understand Array Representation

- Arrays are stored in contiguous memory blocks.
- **Advantages:** Fast index access *O(1)*, predictable memory.
- **Limitations:** Fixed size, costly insertions/deletions.

Step 2: Setup

- *Employee* class includes *employeeId*, *name*, *position*, and *salary*.

Step 3: Implementation

- Use a fixed-size array.
- Methods implemented:
    - *addEmployee()*
    - *searchEmployee()*
    - *displayEmployees()*
    - *deleteEmployee()* (with left shift)

Step 4: Analysis

Operation	Time Complexity
Add	O(1) (if space)
Search	O(n)
Traverse	O(n)
Delete	O(n) (due to shift)

- **Arrays** are suitable for fixed-size data where fast access is needed.

Output