**Employee Management System**

1. Explain how arrays are represented in memory and their advantages.

* Memory Representation: Arrays are stored in contiguous memory locations. Each element can be accessed directly using its index.
* Advantages:

1. Fast Access: Constant time O(1) access to any element using its index.
2. Simple Structure: Easy to implement and manage
3. Analyze the time complexity of each operation (add, search, traverse, delete).

* Add: O(1) if there is space; otherwise, O(n) if resizing is needed.
* Search: O(n) – linear search through the array.
* Traverse: O(n) – visiting each element once.
* Delete: O(n) – finding the element and then shifting or adjusting

1. Discuss the limitations of arrays and when to use them.

* Limitations of Arrays:

1. Fixed Size: Arrays have a fixed size once created, making them inflexible.
2. Inefficient Operations: Operations like insertions and deletions can be inefficient, especially if they require shifting elements.

* When to Use Arrays:

Use arrays when you have a fixed number of elements or need fast access by index. For dynamic or frequent modifications, consider other data structures like lists or hash maps.