**Exercise-4: Employee Management System**

**Understanding Array Representation:**

**Array Representation in Memory:**

* Memory Allocation: Arrays are stored in contiguous memory locations, which means each element is placed next to the previous one**.**

**Advantages:**

* Direct Access: Arrays provide O (1) time complexity for accessing elements using the index.
* Predictable Memory Usage: Since the size of the array is fixed, memory usage is predictable.

**Analysis:**

**Time Complexity:**

**Add Operation**: O (1) if there is space available, otherwise O(n) if resizing is needed.

**Search Operation**: O(n) in the worst case since it requires a linear search.

**Traverse Operation**: O(n) as it needs to iterate through all elements.

**Delete Operation**: O(n) due to the need to shift elements after deletion.

**Limitations of Arrays:**

* **Fixed Size**: The size of the array is fixed at the time of creation, making it inflexible for dynamic datasets.
* **Resizing Overhead**: Resizing an array (if implemented) involves creating a new array and copying elements, which is time-consuming.

**When to Use Arrays?**

* **Small Fixed Size Data**: When the number of elements is known in advance and doesn't change often.
* **Performance Critical**: When direct access to elements is critical, and the overhead of resizing or deletion is acceptable.