**Exercise 4: Employee Management System**

**Arrays in Memory:**

* Arrays in memory are contiguous blocks of memory where elements of the same type are stored sequentially.
* Each element in the array is accessed by its index, starting from 0.
* **Advantages:**
  + **Fast Access:** Retrieving an element by index is O(1) time complexity, which means it's very efficient.
  + **Simple Data Structure:** Arrays are straightforward and easy to understand.
  + **Memory Efficiency:** Arrays use a fixed amount of memory because they are static in size.

**Time Complexity Analysis:**

* **Add Employee:** O(1) on average, but O(n) in the worst case if resizing is needed.
* **Search Employee:** O(n) because in the worst case, you may need to iterate through all elements.
* **Traverse Employees:** O(n), as it requires iterating through all elements.
* **Delete Employee:** O(n), as in the worst case, you may need to shift elements after deletion.

**Limitations of Arrays and When to Use Them:**

* **Fixed Size:** Arrays have a fixed size once initialized, which can be inefficient if the size needs to change frequently.
* **Memory Management:** Arrays can lead to memory wastage if a large size is allocated but not fully used.
* **When to Use:**
  + Arrays are suitable when the number of elements is known and doesn't change frequently.
  + They provide efficient random access and are simple to implement.
  + Use arrays when the size of the collection is fixed or known beforehand.