Case Study – Phone Directory

Analyze the complexity of each operation in your implementation and suggest possible ways to optimize the data structure(s) or algorithm used to improve performance.

- Time Complexity
    - Insertion : O(1) on average(can be O(n) in worst case with collisions)
    - Deletion: O(1) on average(can be O(n) in worst case with collisions)
    - Search by Phone Number : O(1) on average(can be O(n) in worst case with collisions)
    - Search by Name: O(1) on average(can be O(n) in worst case with collisions)
- Possible ways to optimize data structure:
    - Handling collisions
    - Hash Function Optimization
    - Load Factor Monitoring and Resizing.