

PhoneBook Runtime HashMap (Array of Linked Lists)

- Add:

In best case, this is an $O(1)$ runtime. The PhoneBook entry is inserted into the HashMap array at the index calculated by the hash algorithm. Worst case, the entry must be placed into the linked list at a particular index. That would be $O(\log n)$ for the add if the list is a binary tree.

- find:

Similar to add. Best: $O(1)$ Worst: $O(\log n)$

- remove:

$O(1)$ in best case. \rightarrow Use hash algorithm to get index and remove the entry at the index. (One item per index.)

$O(\log n)$ worst case \rightarrow time to traverse the Linked List

- printList

$O(n) \rightarrow$ In order to print each item in the list, you must traverse through n Person objects in the PhoneBook.