

Problem 1: LRU Cache

In this problem the cache key and value pair are stored in form of Doubly Linkedlist. The Doubly Linkedlist is maintained in such a way that the last element is the least recently used cache data. Also, to facilitate constant time access to nodes a lookup table with values referencing to the all the nodes of Doubly LinkedList is used.

Time Complexity:

Get (): $O(1)$ - looking through the lookup table and moving the given node to front.

Set (): $O(1)$ - assigning node at the back of Doubly Linkedlist and assigning value to lookup table.

Space Complexity:

$O(n)$ - storing n items in Doubly LinkedList and their references in a lookup table.