

CS220 - Data Structures and Algorithms

Lab Assignment-4

Circular Linked List

- **add** : This function takes the *Constant* Time Complexity that is **$O(1)$** .
 - When the List is empty initially, using the *add* function will create a Node with the Integer provided which has *next* pointing to itself.
 - When the List is of length 1, using the *add* function will create a new Node & make the pointer of Initial node to point to this Node. So, we will visit 2 Nodes.
 - In all the Other cases, calling the *add* function will create a new node with *next* of that new node pointing to pointer which is stored in *next* of start. Basically, we are adding element at the *second position* always to have constant Time complexity. So here also we will visit 2 Nodes only.

- **remove** : This function takes the *Constant* Time Complexity that is **$O(1)$** .
 - When the list is of length 1, We visit only 1 Node and we remove it when the function is called.
 - But when the length of list is greater than or equal to 2, We delete the second element always to have Constant Time Complexity. In that case we will visit 2 Nodes.

- **isEmpty** : This function takes the *Constant* Time Complexity that is **$O(1)$** .
 - We just check the First node's Pointer *start* and decide whether it is empty or not based on it is pointing to *NULL* or not. So, we can say that we visit only 1 Node.

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