Linked List

Linked List

- It is a series of connected "nodes" that contains the "address" of the next node.

- Each node can store a data point which may be a number, a string or any other type of data.

- we use a linked list data structure to organize that data.

- Each element in a linked list is called as **"Node"**.

Advantages of Linked Lists

- They are a dynamic in nature which allocates the memory when required.

- Insertion and deletion operations can be easily implemented.

- Stacks and queues can be easily executed.

- Linked List reduces the access time.

Linked List Representation

Types of Linked List

Following are the various types of linked list.

- **Single Linked List** − Item navigation is forward only.

- **Doubly Linked List** − Items can be navigated forward and backward.

- **Circular Linked List** − Last item contains link of the first element as next and the first element has a link to the last element as previous.

Basic Operations

Following are the basic operations supported by a list.

- **Insertion** − Adds an element at the beginning of the list.

- **Deletion** − Deletes an element at the beginning of the list.

- **Display** − Displays the complete list.

- **Search** − Searches an element using the given key.

- **Delete** − Deletes an element using the given key.

Single Linkedlist

- Single linked list is a sequence of elements in which every element has link to its next element in the sequence.

- In any single linked list, the individual element is called as **"Node"**.

- Every **"Node"** contains two fields, **data** and **next**.

- The **data** field is used to store actual value of that node

- next field is used to store the address of the next node

Double Linked list

- Double linked list is a sequence of elements in which every element has links to its previous element and next element in the sequence.

- We add a pointer to the previous node in a doubly linked list. Thus, we can go in either direction: forward or backward.

Double linked list

Operations

In a double linked list, we perform the following operations...

- Insertion
- Deletion
- Display

Insertion

- In a double linked list, the insertion operation can be performed in three ways as follows...
- Inserting At Beginning of the list
- Inserting At End of the list
- Inserting At Specific location in the list

Double linked list

Deletion

- In a double linked list, the deletion operation can be performed in three ways as follows...

- Deleting from Beginning of the list

- Deleting from End of the list

- Deleting a Specific Node