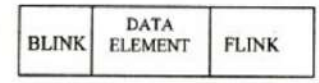
Doubly Linked List

- Each node contains two links namely forward link and backward link.



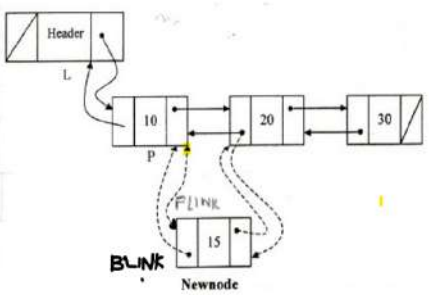

```
Struct Node
{
        int Element;
        Struct Node *FLINK;
        Struct Node *BLINK;
};
```

Operations in DLL – Structure declaration

```
struct node
{
        int element;
        struct node *flink;
        struct node *blink;
};
```

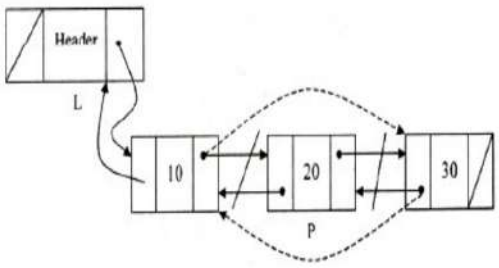
Inserting an element in a DLL

```
Insert (int X, list L, position P)
{
   Struct   Node * Newnode;
   Newnode = malloc (size of (Struct Node));
   If (Newnode ! = NULL)
   {
         Newnode → Element = X;
         Newnode → Flink = P → Flink;
         P → Flink →Blink = Newnode;
         P → Flink = Newnode ;
         Newnode →Blink = P;
}
```



Deleting an element from a DLL

```
void Delete (int X, List L)
{
        position P;
        P = Find (X, L);
        If ( IsLast (P, L))
        {
                Temp = P;
                P → Blink →Flink = NULL;
                free (Temp);
        }
        else
        {
                Temp = P;
                P → Blink →Flink = P→Flink;
                P →Flink →Blink = P→Blink;
                free (Temp); } }
```



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7 Deleting an element from a DLL

8 Features of DLL

9 Circular linked list

10 Singly linked and Doubly linked circular list

11 Comparison of Linked list and Circular linked list

12 Advantages of Circular linked list

Circular linked list

- In CLL, the pointer of the last node points to the first node
- Can be implemented in two ways – Singly linked list and Doubly linked list with or without headers
- In a singly linked circular list, the last node of the list points to the first node.
- In a doubly linked circular list, forward link of the last node points to the first node and backward link of the first node points to the last node.

Slide 9 of 22 English (India) 75%

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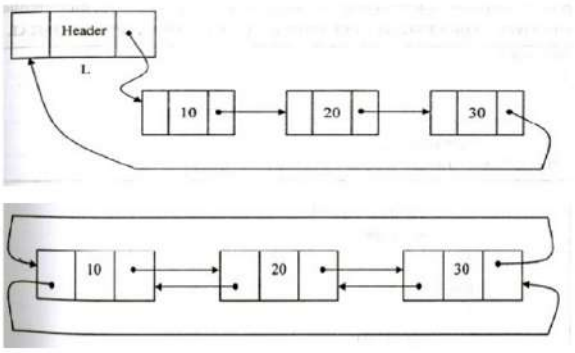
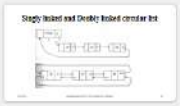
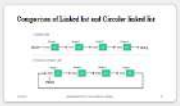
Singly linked and Doubly linked circular list




Applications of Linked List

- Polynomial Manipulation
- Radix sort 45, 34, 21, 09, 03, 12

  21, 12, 03, 34, 45, 09
  03, 09, 12, 21, 34, 45

- Multi list