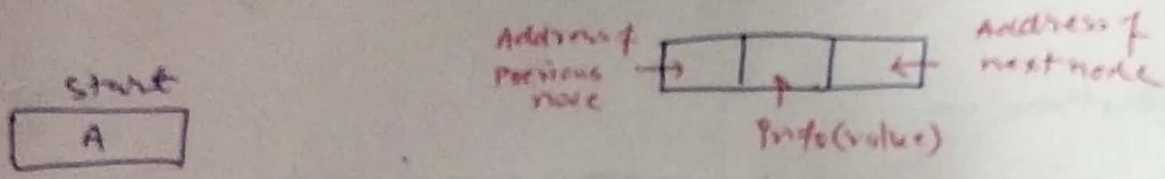
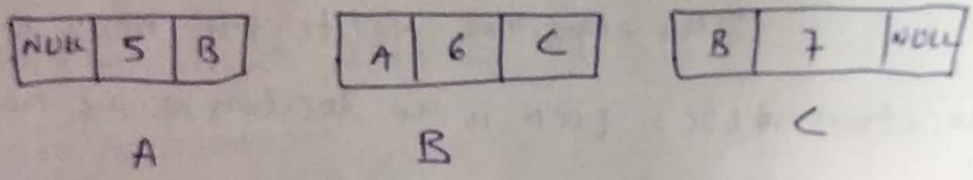
Doubly linked list :—

In the doubly linked list, each node have three parts. One part hold the value of element and two part hold the address of previous or next node.





With this type of arrangement, coupling b/w each and every nodes of list becomes very strong. It is also allows reverse traversal in the link list.

The data structure for doubly l.l. will be as

```
{
  Struct node *previous
   int info;
  Struct node *next
}
```

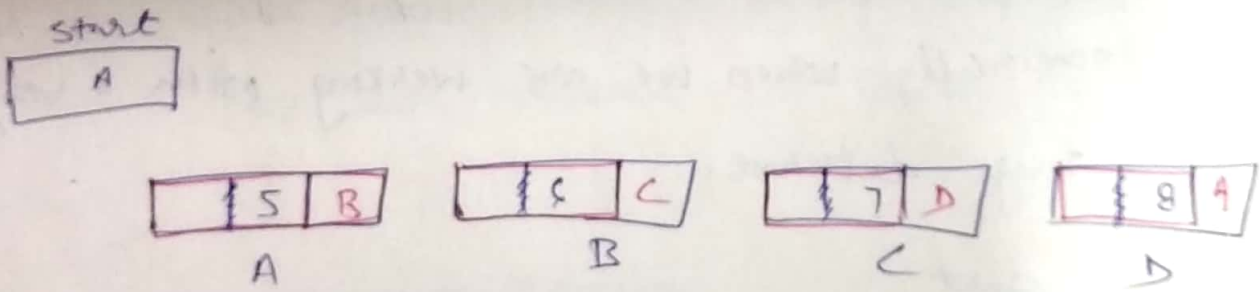
Here struct node *previous is a pointer to structure which contain the address of previous node. and struct node *next contain the

address of next node in the list.

Note:- The only drawback is that each node has to contain the address of information of previous node.

Circular link list:-

In this, circular linked list is a singly link list in which the link field of the last node contains the address of the first node of the list; that means last node does not contain NULL. The arrangement of each node of the list becomes cyclic. That is a circular linked link has no end.



In this example the last node D Contain the address of the first node A.

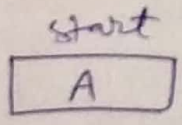
doubly circular link list :-

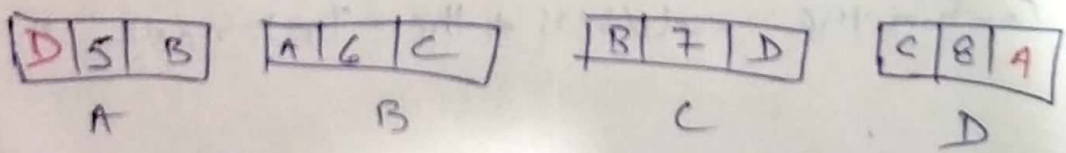
In this link list, Each node two address node and one info node. the address node contain the address of previous node and next node.

we can traverse in both direction so last node store the address of first node and first node store the address of last node.

So this type of linked list traverse in forward direction and as well as backward direction.

The advantage of this link list, can be possible at very huge speed specially when we are working with a very huge database.

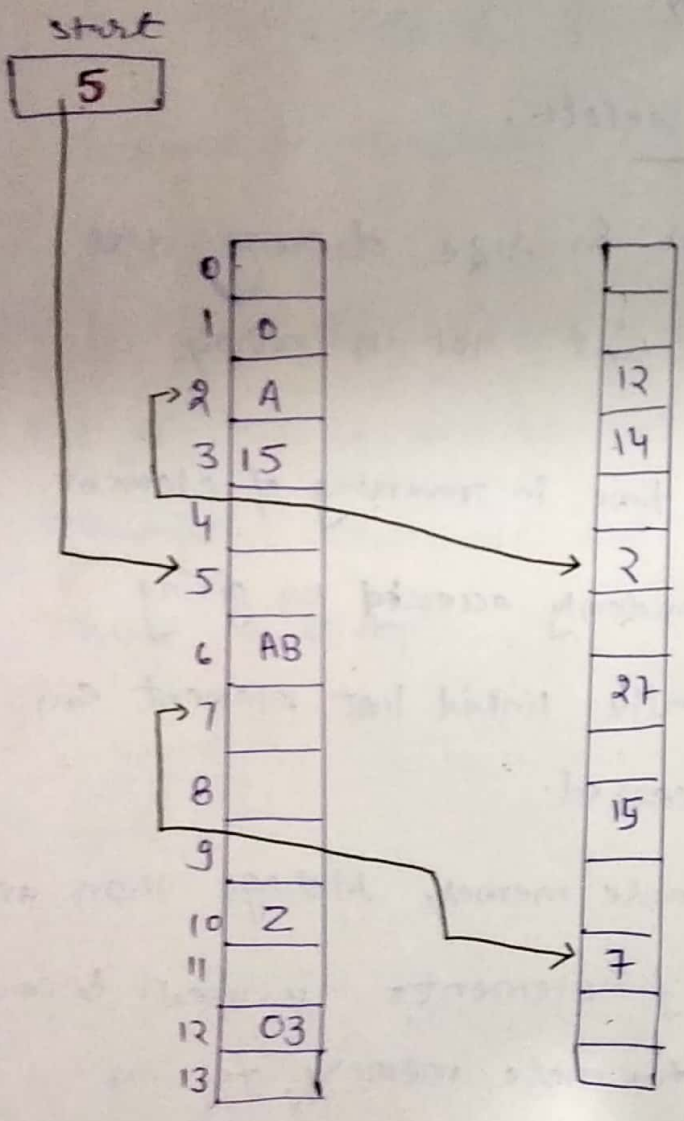




Represent of link list in memory :-

i) let list be a linked link then list will maintain in the memory.

ii) List require to linear array called info and next. Info[K] & next contain the information and next pointer field of a node of list respectively.



Advantage & disadvantage of link list over ~~the~~ array or difference b/w array & linked list :-

Advantage :-

i) We don't know in advance no of element will be require but in array we would need to allocate all the storage on the program started

ii) We can allocate storage dynamically, when we need it, so it is leading to efficient utilization of memory.

iii) Easy to insert and delete.

iv) L.L can grow or shrink in size during the execution of program but not in array.

Disadvantage :-

i) A link list takes more time in traversing of element.

ii) Array elements can be randomly accessed by giving appropriate index, while linked list element can not be randomly accessed.

iii) A link list will use more memory storage than array with the same no. of elements is used. because each time link list has more memory for an additional link field or next ~~ne~~pointer field.

iv) Binary search can not be applied in a link list.