

Part 2 - Types of Linked List

Types of Linked Lists

Based on the structure of linked lists, they can be classified into several types:

- **Singly Linked List**
- **Doubly Linked List**
- **Circular Linked List**

1. Singly Linked List

The singly linked list is the simplest form of linked list, where each node contains two members: **data** and a **next pointer** that stores the address of the next node. Each node in a singly linked list is connected through the next pointer, and the next pointer of the last node points to `NULL`, denoting the end of the list.

Singly Linked List Representation

A singly linked list can be represented as a pointer to the first node, where each node contains:

- **Data:** Actual information stored in the node.
- **Next:** Pointer to the next node.

```
// Structure to represent the singly linked list
struct Node {
    int data;        // Data field
    struct Node* next; // Pointer to the next node
};
```

2. Doubly Linked List

The doubly linked list is a modified version of the singly linked list. Each node contains three members: **data**, **next**, and **prev**. The `prev` pointer stores the address of the previous node. Nodes are connected via both `next` and `prev` pointers. The `prev` pointer of the first node and the `next` pointer of the last node point to `NULL`.

Doubly Linked List Representation

Each node contains:

- **Data:** Actual information stored.
- **Next:** Pointer to the next node.

- **Prev:** Pointer to the previous node.

```
// Structure to represent the doubly linked list
struct Node {
    int data;          // Data field
    struct Node* next; // Pointer to the next node
    struct Node* prev; // Pointer to the previous node
};
```

3. Circular Linked List

A circular linked list is similar to a singly linked list, except the next pointer of the last node points to the **first node** instead of `NULL`. This circular nature is useful in applications like media players.

Circular Linked List Representation

Each node contains:

- **Data:** Actual information stored.
- **Next:** Pointer to the next node; the last node points to the first node.

```
// Structure to represent the circular linked list
struct Node {
    int data;          // Data field
    struct Node* next; // Pointer to the next node
};
```

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