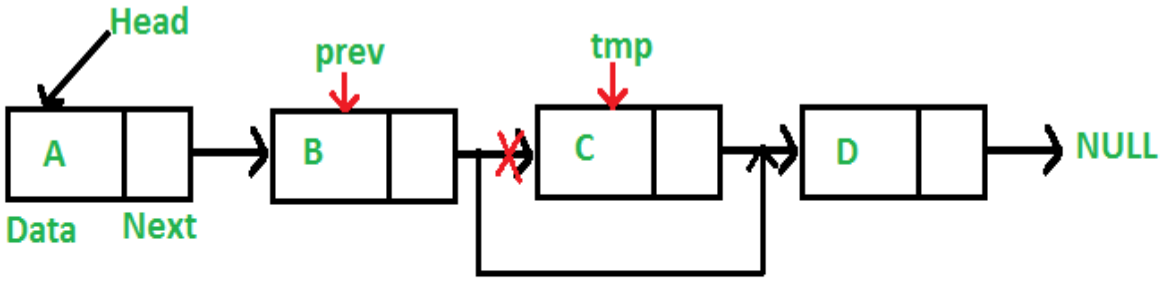
Linked List | Deleting a node

We have discussed Linked List Introduction and Linked List Insertion in previous posts on singly linked list. Let us formulate the problem statement to understand the deletion process. Given a key or value, we delete the first occurrence of this key in linked list.

To delete a node from linked list, we need to do following steps.
1) Find previous node of the node to be deleted.
2) Change the next of previous node.
3) Free memory for the node to be deleted.



Since every node of linked list is dynamically allocated using malloc() function, we need to call free() function to release or deallocate the memory.

```
#include <stdio.h>
#include <stdlib.h>

// A linked list node
struct Node
{
    int data;
    struct Node *next;
};

/* Given a reference (pointer to pointer) to the head of a list
   and an int, inserts a new node on the front of the list. */
void insert(struct Node** head_ref, int new_data)
{
    struct Node* new_node = (struct Node*) malloc(sizeof(struct Node));
    new_node->data  = new_data;
    new_node->next = (*head_ref);
    (*head_ref) = new_node;
}

/* Given a reference (pointer to pointer) to the head of a list
```

```
   and a key, deletes the first occurrence of key in linked list */
void deleteNode(struct Node **head_ref, int key)
{
    // Store head node
    struct Node* temp = *head_ref, *prev;

    // If head node itself holds the key to be deleted
    if (temp != NULL && temp->data == key)
    {
        *head_ref = temp->next;   // Changed head
        free(temp);               // free old head
        return;
    }

    // Search for the key to be deleted, keep track of the
    // previous node as we need to change 'prev->next'
    while (temp != NULL && temp->data != key)
    {
        prev = temp;
        temp = temp->next;
    }

    // If key was not present in linked list
    if (temp == NULL) return;

    // Unlink the node from linked list
    prev->next = temp->next;

    free(temp);  // Free memory
}

// This function prints contents of linked list starting from
// the given node
void printList(struct Node *node)
{
    while (node != NULL)
    {
        printf(" %d ", node->data);
        node = node->next;
    }
}

/* Drier program to test above functions*/
int main()
{
    /* Start with the empty list */
    struct Node* head = NULL;

    insert(&head, 7);
    insert(&head, 1);
    insert(&head, 3);
```

```
    insert(&head, 2);

    printf("Created Linked List: ");
    printList(head);
    deleteNode(&head, 1);
    printf("\n Linked List after Deletion of 1: ");
    printList(head);
    return 0;
}
```

Output:

```
Created Linked List:

 2  3  1  7

Linked List after Deletion of 1:

 2  3  7
```