

Aim:

Write a program that uses functions to perform the following **operations on Circular linked list**

i)Creation ii)insertion iii)deletion iv) Traversal

Source Code:AlloperationsinCLL.c

```
#include<stdio.h>
#include<stdlib.h>
struct node {
    int data;
    struct node*next;
};
void insert();
void deletion();
void find();
void print();
struct node*head=NULL;
int main() {
    int choice;
    printf("CIRCULAR LINKED LIST IMPLEMENTATION OF LIST ADT\n");
    while(1) {
        printf("1.INSERT");
        printf(" 2.DELETE");
        printf(" 3.FIND");
        printf(" 4.PRINT");
        printf(" 5.QUIT\n");
        printf("Enter the choice: ");
        scanf("%d",&choice);
        switch(choice) {
            case 1:insert();break;
            case 2:deletion();break;
            case 3:find();break;
            case 4:print();break;
            case 5:exit(0);
        }
    }
}

void insert() {
    int x,n;
    struct node*newnode,*temp=head,*prev;
    newnode=(struct node*)malloc(sizeof(struct node));
    printf("Enter the element to be inserted: ");
    scanf("%d",&x);
    printf("Enter the position of the element: ");
    scanf("%d",&n);
    newnode->data=x;
    newnode->next=NULL;
    if(head==NULL) {
        head=newnode;
        newnode->next=newnode;
    }
}
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else if(n==1) {
    temp=head;
    newnode->next=temp;
    while(temp->next!=head)
        temp=temp->next;
    temp->next=newnode;
    head=newnode;
}
else {
    for(int i=1;i<n-1;i++) {
        temp=temp->next;
    }
    newnode->next=temp->next;
    temp->next=newnode;
}
}

void deletion() {
    struct node*temp=head,*prev,*temp1=head;
    int key,count=0;
    printf("Enter the element to be deleted: ");
    scanf("%d",&key);
    if(temp->data==key) {
        prev=temp->next;
        while(temp->next!=head) {
            temp=temp->next;
        }
        temp->next=prev;
        free(head);
        head=prev;
        printf("Element deleted\n");
    }
    else {
        while(temp->next!=head) {
            if(temp->data==key) {
                count+=1;
                break;
            }
            prev=temp;
            temp=temp->next;
        }
        if(temp->data==key) {
            prev->next=temp->next;
            free(temp);
            printf("Element deleted\n");
        }
        else {
            printf("Element does not exist...!\n");
        }
    }
}

void find() {
    struct node*temp=head;
    int key,count=0;
    printf("Enter the element to be searched: ");
    scanf("%d",&key);
    while(temp->next!=head) {

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if(temp->data==key) {
    count=1;
    break;
}
temp=temp->next;
}
if(count==1)
printf("Element exist...\n");
else {
    if(temp->data==key)
        printf("Element exist...\n");
    else
        printf("Element does not exist...\n");
}
}
void print() {
    struct node*temp=head;
    printf("The list element are: ");
    while(temp->next!=head) {
        printf("%d -> ",temp->data);
        temp=temp->next;
    }
    printf("%d -> ",temp->data);
    printf("\n");
}

```

Execution Results - All test cases have succeeded!

Test Case - 1
User Output
CIRCULAR LINKED LIST IMPLEMENTATION OF LIST ADT 1
1.INSERT 2.DELETE 3.FIND 4.PRINT 5.QUIT 1
Enter the choice: 1
Enter the element to be inserted: 12
Enter the position of the element: 1
1.INSERT 2.DELETE 3.FIND 4.PRINT 5.QUIT 1
Enter the choice: 1
Enter the element to be inserted: 14
Enter the position of the element: 2
1.INSERT 2.DELETE 3.FIND 4.PRINT 5.QUIT 1
Enter the choice: 1
Enter the element to be inserted: 15
Enter the position of the element: 3
1.INSERT 2.DELETE 3.FIND 4.PRINT 5.QUIT 4
Enter the choice: 4
The list element are: 12 -> 14 -> 15 -> 2

1.INSERT 2.DELETE 3.FIND 4.PRINT 5.QUIT 2
Enter the choice: 2
Enter the element to be deleted: 14
Element deleted 4
1.INSERT 2.DELETE 3.FIND 4.PRINT 5.QUIT 4
Enter the choice: 4
The list element are: 12 -> 15 -> 3
1.INSERT 2.DELETE 3.FIND 4.PRINT 5.QUIT 3
Enter the choice: 3
Enter the element to be searched: 12
Element exist...! 5
1.INSERT 2.DELETE 3.FIND 4.PRINT 5.QUIT 5
Enter the choice: 5

Test Case - 2
User Output
CIRCULAR LINKED LIST IMPLEMENTATION OF LIST ADT 1
1.INSERT 2.DELETE 3.FIND 4.PRINT 5.QUIT 1
Enter the choice: 1
Enter the element to be inserted: 54
Enter the position of the element: 1
1.INSERT 2.DELETE 3.FIND 4.PRINT 5.QUIT 2
Enter the choice: 2
Enter the element to be deleted: 1
Element does not exist...! 4
1.INSERT 2.DELETE 3.FIND 4.PRINT 5.QUIT 4
Enter the choice: 4
The list element are: 54 -> 1
1.INSERT 2.DELETE 3.FIND 4.PRINT 5.QUIT 1
Enter the choice: 1
Enter the element to be inserted: 65
Enter the position of the element: 2
1.INSERT 2.DELETE 3.FIND 4.PRINT 5.QUIT 4
Enter the choice: 4
The list element are: 54 -> 65 -> 5
1.INSERT 2.DELETE 3.FIND 4.PRINT 5.QUIT 5
Enter the choice: 5