

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;
}
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)
    {
        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!

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