

**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);break;
        }
    }
}
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);
      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!

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