2022-2026-CSE-B

#### 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++)</pre>
         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!

# 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

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