S.No: 15	Exp. Name: ***C program to which performs all operations on Circular linked list.***	Date:2023-05-13

ID: 224G1A0516

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!

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
```