

ANVITA KUMAR
C-22
Roll No.: 2104097

//Write a menu driven code to implement Circular Linked List

```
#include <stdio.h>

#include <stdlib.h>

#include <malloc.h>

struct node
{
    int data;
    struct node *next;
};

struct node *start = NULL;

struct node *createCLL(struct node *start);

struct node *display(struct node *start);

struct node *InsertAtBeginning(struct node *start);

struct node *InsertAtEnd(struct node *start);

struct node *DeleteBeginning(struct node *start);

struct node *DeleteEnd(struct node *start);

struct node *ForwardTraversal(struct node *start);

struct node *BackwardTraversal(struct node *start);

struct node *Count(struct node *start);

int main()
{
    int choice;

    start = createCLL(start);

    printf("\n\nCIRCULAR LINKED LIST CREATED\n");

    start = display(start);

    do {
        printf("\n\n****List of Operations****");

        printf("\n 1: Insert at beginning");

        printf("\n 2: Insert at end");

        printf("\n 3: Delete from beginning");
```

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```
printf("\n 4: Delete from end");

printf("\n 5: Forward Traversal");

printf("\n 6: Backward Traversal");

printf("\n 7: Count number of nodes");

printf("\n 8: EXIT");

printf("\n\nEnter your choice: ");

scanf("%d", &choice);

switch (choice) {

case 1:

    start = InsertAtBeginning(start);

    printf("\n");

    start = display(start);

    break;

case 2:

    start = InsertAtEnd(start);

    printf("\n");

    start = display(start);

    break;

case 3:

    start = DeleteBeginning(start);

    printf("\n");

    start = display(start);

    break;

case 4:

    start = DeleteEnd(start);

    printf("\n");

    start = display(start);

    break;

case 5:

    start = ForwardTraversal(start);

    printf("\n");
```

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```
        break;

    case 6:

        start = BackwardTraversal(start);

        printf("\n");

        start = display(start);

        break;

    case 7:

        start = Count(start);

        printf("\n");

        break;

    case 8:

        printf("\n\tEXIT POINT");

        break;

    }

} while (choice != 8);

return 0;

}

struct node *createCLL(struct node *start)
{
    struct node *new_node, *ptr;

    int num;

    printf("\nEnter a value(enter -1 to end): ");

    scanf("%d", &num);

    while (num != -1) {

        new_node = (struct node *)malloc(sizeof(struct node));

        new_node->data = num;

        if (start == NULL) {

            new_node->next = new_node;

            start = new_node;

        }

        else
```

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```
{  
    ptr = start;  
    while (ptr->next != start)  
        ptr = ptr->next;  
    ptr->next = new_node;  
    new_node->next = start;  
}  
printf("Enter a value: ");  
scanf("%d", &num);  
}  
return start;  
}  
struct node *display(struct node *start)  
{  
    struct node *ptr;  
    ptr = start;  
    while (ptr->next != start) {  
        printf("\t%d", ptr->data);  
        ptr = ptr->next;  
    }  
    printf("\t%d", ptr->data);  
    return start;  
}  
struct node *InsertAtBeginning(struct node *start)  
{  
    struct node *new_node, *ptr;  
    int num;  
    printf("Enter a value: ");  
    scanf("%d", &num);  
    new_node = (struct node *)malloc(sizeof(struct node));  
    new_node->data = num;
```

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```
    ptr = start;

    while (ptr->next != start)

        ptr = ptr->next;

    ptr->next = new_node;

    new_node->next = start;

    start = new_node;

    return start;

}

struct node *InsertAtEnd(struct node *start)

{

    struct node *ptr, *new_node;

    int num;

    printf("\n Enter the data : ");

    scanf("%d", &num);

    new_node = (struct node *)malloc(sizeof(struct node));

    new_node->data = num;

    ptr = start;

    while (ptr->next != start)

        ptr = ptr->next;

    ptr->next = new_node;

    new_node->next = start;

    return start;

}

struct node *DeleteBeginning(struct node *start)

{

    struct node *ptr;

    ptr = start;

    while (ptr->next != start)

        ptr = ptr->next;

    ptr->next = start->next;

    free(start);
```

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```
start = ptr->next;
```

```
return start;
```

```
}
```

```
struct node *DeleteEnd(struct node *start)
```

```
{
```

```
    struct node *ptr, *preptr;
```

```
    ptr = start;
```

```
    while (ptr->next != start) {
```

```
        preptr = ptr;
```

```
        ptr = ptr->next;
```

```
    }
```

```
    preptr->next = ptr->next;
```

```
    free(ptr);
```

```
    return start;
```

```
}
```

```
struct node *ForwardTraversal(struct node *start)
```

```
{
```

```
    struct node *ptr;
```

```
    ptr = start;
```

```
    if (ptr == NULL) {
```

```
        printf("\tEmpty List!");
```

```
    }
```

```
    else
```

```
    {
```

```
        printf("\n");
```

```
        while (ptr->next != start) {
```

```
            printf("\t%d", ptr->data);
```

```
            ptr = ptr->next;
```

```
        }
```

```
        printf("\t%d", ptr->data);
```

```
    }
```

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```
    return start;
}

struct node *BackwardTraversal(struct node *start)
{
    struct node* prev = start;
    struct node *current = start;
    struct node *temp = start;
    current=current->next;
    temp=temp->next->next;
    while (current != start) {
        current->next = prev;
        prev = current;
        current = temp;
        temp = current->next;
    }
    start = prev;
    current->next = start;
}

struct node *Count(struct node *start)
{
    int i=0;
    struct node *current = start;
    do {
        start = start->next;
        i++;
    } while (current != start);
    printf("Number of nodes in the list: %d", i);
}
```

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```
File Edit Selection View Go Run Terminal Help
circular.c - .vscode - Visual Studio Code

C circular.c U X
C circular.c > ...
1 #include <stdio.h>

PROBLEMS DEBUG CONSOLE TERMINAL JUPYTER

> TERMINAL
PS C:\Users\Saniha Kumar\Desktop\Anvita\C program\exp2\.vscode> cd "c:\Users\Saniha Kumar\Desktop\Anvita\C program\exp2\.vscode\" ; if ($?) { gcc circular.c -o circular } ; if ($?) { .\circular }

Enter a value(enter -1 to end): 2
Enter a value: 3
Enter a value: 4
Enter a value: -1

CIRCULAR LINKED LIST CREATED
2 3 4

****List of Operations****
1: Insert at beginning
2: Insert at end
3: Delete from beginning
4: Delete from end
5: Forward Traversal
6: Backward Traversal
7: Count number of nodes
8: EXIT

Enter your choice: 1
Enter a value: 1

1 2 3 4

****List of Operations****
1: Insert at beginning
2: Insert at end
3: Delete from beginning
4: Delete from end
```

```
File Edit Selection View Go Run Terminal Help
circular.c - .vscode - Visual Studio Code

C circular.c U X
C circular.c > ...
1 #include <stdio.h>

PROBLEMS DEBUG CONSOLE TERMINAL JUPYTER

> TERMINAL
8: EXIT

Enter your choice: 2

Enter the data : 5

1 2 3 4 5

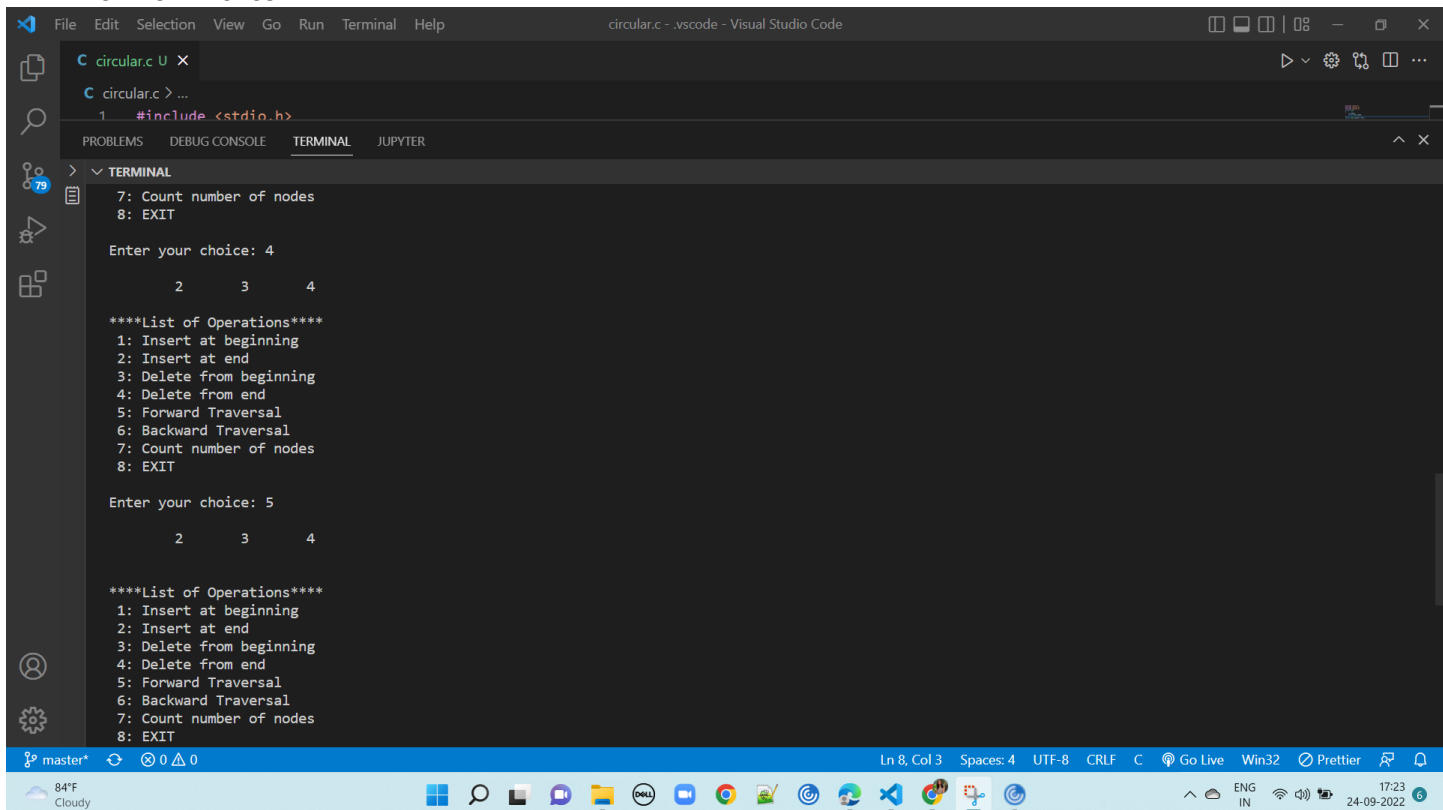
****List of Operations****
1: Insert at beginning
2: Insert at end
3: Delete from beginning
4: Delete from end
5: Forward Traversal
6: Backward Traversal
7: Count number of nodes
8: EXIT

Enter your choice: 3

2 3 4 5

****List of Operations****
1: Insert at beginning
2: Insert at end
3: Delete from beginning
4: Delete from end
5: Forward Traversal
6: Backward Traversal
7: Count number of nodes
8: EXIT
```


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```
File Edit Selection View Go Run Terminal Help
circular.c - .vscode - Visual Studio Code

C circular.c U X
C circular.c > ...
1 #include <stdio.h>

PROBLEMS DEBUG CONSOLE TERMINAL JUPYTER

> TERMINAL
7: Count number of nodes
8: EXIT

Enter your choice: 4

2 3 4

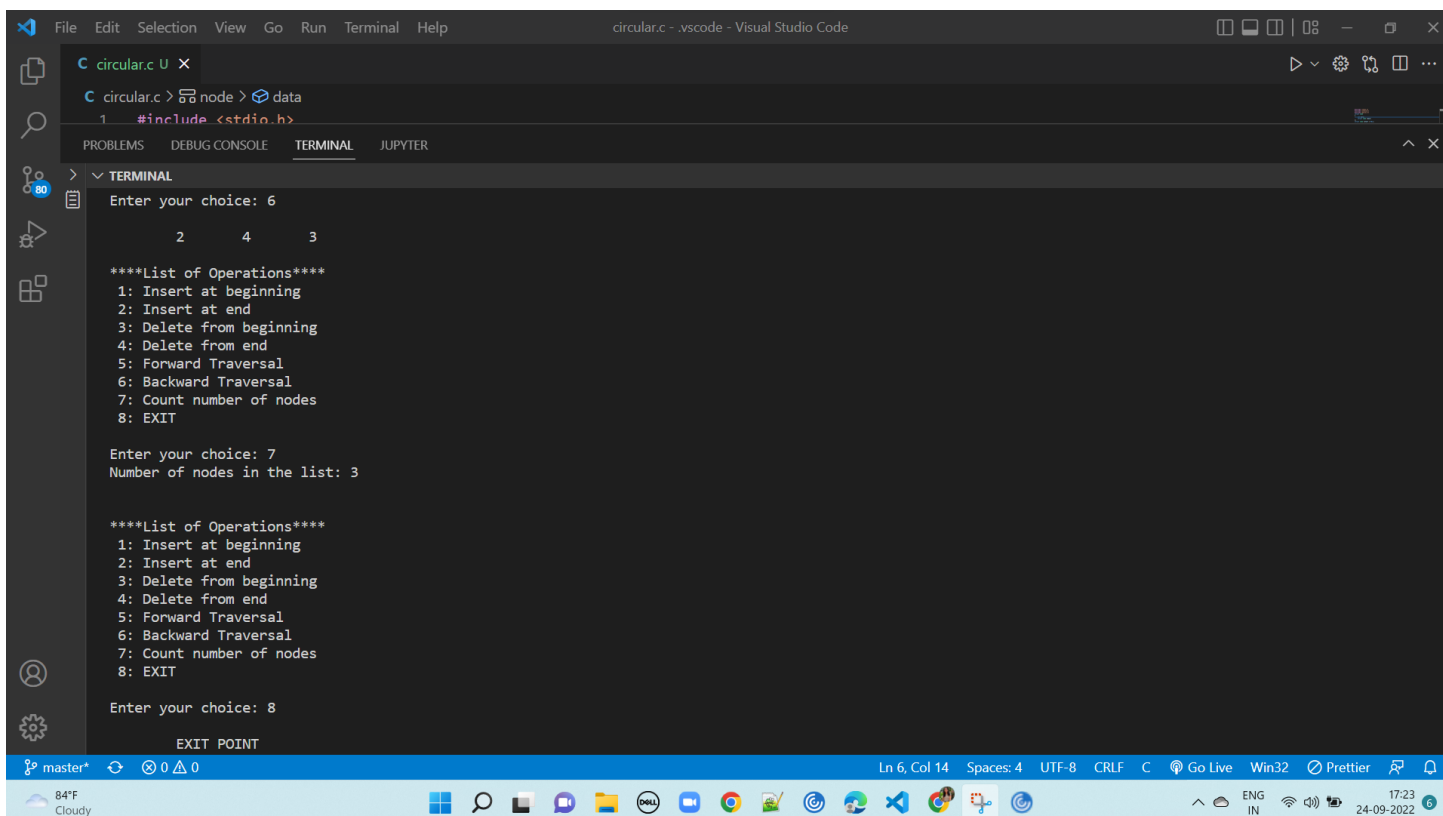
****List of Operations****
1: Insert at beginning
2: Insert at end
3: Delete from beginning
4: Delete from end
5: Forward Traversal
6: Backward Traversal
7: Count number of nodes
8: EXIT

Enter your choice: 5

2 3 4

****List of Operations****
1: Insert at beginning
2: Insert at end
3: Delete from beginning
4: Delete from end
5: Forward Traversal
6: Backward Traversal
7: Count number of nodes
8: EXIT

master* 0 0 0 Ln 8, Col 3 Spaces: 4 UTF-8 CRLF C Go Live Win32 Prettier 17:23 24-09-2022
```



```
File Edit Selection View Go Run Terminal Help
circular.c - .vscode - Visual Studio Code

C circular.c U X
C circular.c > node > data
1 #include <stdio.h>

PROBLEMS DEBUG CONSOLE TERMINAL JUPYTER

> TERMINAL
Enter your choice: 6

2 4 3

****List of Operations****
1: Insert at beginning
2: Insert at end
3: Delete from beginning
4: Delete from end
5: Forward Traversal
6: Backward Traversal
7: Count number of nodes
8: EXIT

Enter your choice: 7
Number of nodes in the list: 3

****List of Operations****
1: Insert at beginning
2: Insert at end
3: Delete from beginning
4: Delete from end
5: Forward Traversal
6: Backward Traversal
7: Count number of nodes
8: EXIT

Enter your choice: 8

EXIT POINT

master* 0 0 0 Ln 6, Col 14 Spaces: 4 UTF-8 CRLF C Go Live Win32 Prettier 17:23 24-09-2022
```