

Lab Program 8:-

8) Write a program to implement Stack & Queue using linked representation.

```
#include<stdio.h>
#include<conio.h>
#include<malloc.h>
#include<process.h>

Struct node
{
    int info;
    struct node * link;
};

typedef struct struct node * NODE;
NODE getnode()
{
    NODE x;
    x = (NODE) malloc(sizeof(struct node));
    if (x == NULL),
        {
            printf (" mem full \n");
            exit(0);
        }
    return x;
}

void freenode(NODE x)
{
    free(x);
}

NODE insert_rear(NODE first, int item)
{
    NODE temp, cur;
    temp = getnode();
    temp->info = item;
```

```

temp->link = NULL;
if (first == NULL)
    return temp;
cur = first;
while (cur->link != NULL)
    cur = cur->link;
cur->link = temp;
return first;
}

```

```

NODE delete_front(NODE first) {
NODE temp;
if (first == NULL) {
printf("list is empty cannot delete \n");
return first;
}
temp = first;
temp = temp->link;
printf("item deleted at front-end is = %d \n", first->info);
free(first);
return temp;
}

```

```

void display(NODE first) {
NODE temp;
if (first == NULL) {
printf("list empty cannot display items \n");
for (temp = first; temp != NULL; temp = temp->link).
}

```

```

    printf("%d \n", temp->info);
}

```

```

NODE insert_front(NODE first, int item) {
NODE temp;
temp = get-node();
temp->info = item;
temp->link = NULL;
}

```

```

if (first == NULL)
    return temp;
temp->link = first;
first = temp;
return first;
}

NODE delete_at_front_if(NODE first) {
NODE temp;
if (first == NULL) {
    printf("stack is empty cannot delete\n");
    return first;
}
temp = first;
temp = temp->link;
printf("item deleted at front-end is = %d\n", first->info);
free(first);
return temp;
}

void display_s(NODE first) {
NODE temp;
if (first == NULL)
    printf("stack empty cannot display items\n");
for (temp = first; temp != NULL; temp = temp->link)
{
    printf("%d\n", temp->info);
}

int main() {
int item, choice, pos;
NODE first = NULL;
system("cls");
for (;;) {
    printf("In Queue operation :\n 1: insert rear\n 2: delete front\n 3: display-list(Queue)\n 4: stack operations\n 5: insert front\n 6: delete front\n 7: display-list(Stack)\n");
}

```

```
7: Exit \n");
printf(" enter the choice \n");
scanf("%d",&choice);
switch(choice)
{
    case 1: printf(" enter the item at rear-end \n");
        scanf("%d",&item);
        first = insert_rear(first,item);
        break;
    case 2: first = delete_front(first);
        break;
    case 3: display(first);
        break;
    case 4: printf(" enter the item at front-end \n");
        scanf("%d",&item);
        first = insert_front(first,item);
        break;
    case 5: first = delete_front_S(first);
        break;
    case 6: display_S(first);
        break;
    default: exit(0);
        break;
}
getch();
return 0;
}
```

Linked_lists_stacks_queues - [Linked_lists_stacks_queues.dev] - [Executing] - Dev-C++ 5.11

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TDM-GCC 4.9.2 64-bit Release

(globals)

```
linked_lists_queue_stack.cpp
```

```
1 #include <stdio.h>
2 #include <conio.h>
3 #include <malloc.h>
4 #include <process.h>
5 struct node
6 {
7     int info;
8     struct node *link;
9 };
10 typedef struct node *NODE;
11 NODE get_node()
12 {
13     NODE x;
14     x=(NODE) malloc(sizeof(struct node));
15     if(x==NULL)
16     {
17         printf("mem full\n");
18         exit(0);
19     }
20     return x;
21 }
22 void freenode(NODE x)
23 {
24     free(x);
25 }
26 NODE insert_rear(NODE first, int item)
27 {
28     NODE temp, cur;
29     temp=get_node();
30     temp->info=item;
31     temp->link=NULL;
32     if(first==NULL)
33         return temp;
34     cur=first;
35     while(cur->link!=NULL)
36         cur=cur->link;
37     cur->link=temp;
```

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Line: 97 Col: 15 Sel: 0 Lines: 134 Length: 2388 Insert Done parsing in 0.031 seconds

public int __cdecl printf(const char * __restrict__ _Format, ...)

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(globals)

```
linked_lists_queue_stack.cpp
```

```
36 | cur=cur->link;
37 | cur->link=temp;
38 | return first;
39 |
40 NODE delete_front(NODE first)
41 {
42 NODE temp;
43 if(first==NULL)
44 {
45 printf("list is empty cannot delete\n");
46 return first;
47 }
48 temp=first;
49 temp=temp->link;
50 printf("item deleted at front-end is=%d\n", first->info);
51 free(first);
52 return temp;
53 }
54 void display(NODE first)
55 {
56 NODE temp;
57 if(first==NULL)
58 printf("list empty cannot display items\n");
59 for(temp=first; temp!=NULL; temp=temp->link)
60 {
61 printf ("%d \n", temp->info);
62 }
63 }
64 NODE insert_front(NODE first, int item)
65 {
66 NODE temp;
67 temp=get_node();
68 temp->info=item;
69 temp->link=NULL;
70 if(first==NULL)
71 return temp;
72 temp->link=first;
```

Compiler Resources Compile Log Debug Find Results

Line: 97 Col: 15 Sel: 0 Lines: 134 Length: 2388 Insert Done parsing in 0.031 seconds

public int __cdecl printf(const char * __restrict__ _Format, ...)

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(globals)

```
linked_lists_queue_stack.cpp
```

```
73     first = temp;
74     return first;
75 }
76 NODE delete_front_s(NODE first)
77 {
78     NODE temp;
79     if(first==NULL)
80     {
81         printf("stack is empty cannot delete\n");
82         return first;
83     }
84     temp=first;
85     temp=temp->link;
86     printf("item deleted at front-end is=%d\n", first->info);
87     free(first);
88     return temp;
89 }
90 void display_s(NODE first)
91 {
92     NODE temp;
93     if(first==NULL)
94     printf("stack empty cannot display items\n");
95     for(temp=first; temp!=NULL; temp=temp->link)
96     {
97         printf ("%d\n", temp->info);
98     }
99 }
100 int main()
101 {
102     int item_choice, pos;
103     NODE first=NULL;
104     system("cls");
105     for(;;)
106     {
107         printf("\n Queue operations :\n 1:Insert_rear\n 2:Delete_front\n 3:Display_list(Queue)\n\n Stack operations \n 4:Insert_front\n 5:");
108         printf("enter the choice \n");
109         scanf (" %d", &choice);
110 }
```

Compiler Resources Compile Log Debug Find Results

Line: 97 Col: 15 Sel: 0 Lines: 134 Length: 2388 Insert Done parsing in 0.031 seconds

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TDM-GCC 4.9.2 64-bit Release

linked_lists_stacks_queues.cpp (globals)

```
public int __cdecl printf(const char * __restrict__ _Format, ...)
```

99 }
100 int main()
101 {
102 int item choice, pos;
103 NODE first=NULL;
104 system("cls");
105 for(;;)
106 {
107 printf("\n Queue operations :\n 1:Insert_rear\n 2:Delete_front\n 3:Display_list(Queue)\n\n Stack operations \n 4:Insert_front\n 5:
108 printf("enter the choice \n");
109 scanf("%d", &choice);
110 switch(choice)
111 {
112 case 1: printf("enter the item at rear-end\n");
113 scanf("%d", &item);
114 first=insert_rear(first, item);
115 break;
116 case 2: first=delete_front(first);
117 break;
118 case 3: display(first);
119 break;
120 case 4: printf("enter the item at front-end\n");
121 scanf("%d", &item);
122 first=insert_front(first, item);
123 break;
124 case 5: first=delete_front_s(first);
125 break;
126 case 6: display_s(first);
127 break;
128 default: exit(0);
129 break;
130 }
131 }
132 getch();
133 return 0;
134 }

Compiler Resources Compile Log Debug Find Results

Line: 97 Col: 15 Sel: 0 Lines: 134 Length: 2388 Insert Done parsing in 0.031 seconds

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C:\Users\sohan\Desktop\C Programs\Data Structures Lab\linked_list_stack_queues\Linked_lists_stacks_queues.exe

Queue operations :
1:Insert_rear
2:Delete_front
3:Display_list(Queue)

Stack operations
4:Insert_front
5: Delete_front
6:Display_list(Stack)
7:Exit

enter the choice

1
enter the item at rear-end
34

Queue operations :
1:Insert_rear
2:Delete_front
3:Display_list(Queue)

Stack operations
4:Insert_front
5: Delete_front
6:Display_list(Stack)
7:Exit

enter the choice

1
enter the item at rear-end
54

Queue operations :
1:Insert_rear
2:Delete_front
3:Display_list(Queue)

Stack operations
4:Insert_front
5: Delete_front
6:Display_list(Stack)
7:Exit

enter the choice

2
item deleted at front-end is=34

Queue operations :
1:Insert_rear

Windows Search



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C:\Users\sohan\Desktop\C Programs\Data Structures Lab\linked_list_stack_queues\Linked_lists_stacks_queues.exe

```
enter the choice  
2  
item deleted at front-end is=34
```

```
Queue operations :  
1:Insert_rear  
2:Delete_front  
3:Display_list(Queue)
```

```
Stack operations  
4:Insert_front  
5: Delete_front  
6:Display_list(Stack)  
7:Exit
```

```
enter the choice  
3  
54
```

```
Queue operations :  
1:Insert_rear  
2:Delete_front  
3:Display_list(Queue)
```

```
Stack operations  
4:Insert_front  
5: Delete_front  
6:Display_list(Stack)  
7:Exit
```

```
enter the choice  
4  
enter the item at front-end  
6
```

```
Queue operations :  
1:Insert_rear  
2:Delete_front  
3:Display_list(Queue)
```

```
Stack operations  
4:Insert_front  
5: Delete_front  
6:Display_list(Stack)  
7:Exit
```

```
enter the choice  
4  
enter the item at front-end  
7
```



C:\Users\sohan\Desktop\C Programs\Data Structures Lab\linked_list_stack_queues\Linked_lists_stacks_queues.exe

7:Exit

enter the choice

4

enter the item at front-end

7

Queue operations :

1:Insert_rear

2:Delete_front

3:Display_list(Queue)

Stack operations

4:Insert_front

5: Delete front

6:Display_list(Stack)

7:Exit

enter the choice

4

enter the item at front-end

8

Queue operations :

1:Insert_rear

2:Delete_front

3:Display_list(Queue)

Stack operations

4:Insert_front

5: Delete front

6:Display_list(Stack)

7:Exit

enter the choice

5

item deleted at front-end is=8

Queue operations :

1:Insert_rear

2:Delete_front

3:Display_list(Queue)

Stack operations

4:Insert_front

5: Delete front

6:Display_list(Stack)

7:Exit

enter the choice



Search



C:\Users\sohan\Desktop\C Programs\Data Structures Lab\linked_list_stack_queues\Linked_lists_stacks_queues.exe

2:Delete_front
3:Display_list(Queue)

Stack operations
4:Insert_front
5: Delete_front
6:Display_list(Stack)
7:Exit

enter the choice

5

item deleted at front-end is=8

Queue operations :
1:Insert_rear
2:Delete_front
3:Display_list(Queue)

Stack operations
4:Insert_front
5: Delete_front
6:Display_list(Stack)
7:Exit

enter the choice

6

7

6

54

Queue operations :
1:Insert_rear
2:Delete_front
3:Display_list(Queue)

Stack operations
4:Insert_front
5: Delete_front
6:Display_list(Stack)
7:Exit

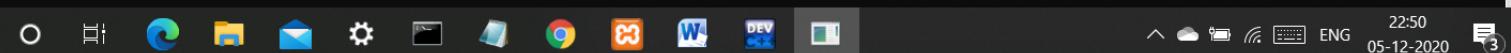
enter the choice

7

Process exited after 78.14 seconds with return value 0
Press any key to continue . . .



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