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Q) Write a menu driven program to implement the following in a single Link List :

1. Creation of a node
2. Insert an element at beginning
3. Insert an element at end
4. Display

Code :

```
Linked-List.cpp
1  #include <stdio.h>
2  #include <stdlib.h>
3
4  struct Node {
5      int data;
6      struct Node* next;
7  };
8
9  void push(struct Node** head_ref, int new_data)
10 {
11
12     struct Node* new_node = (struct Node*) malloc(sizeof(struct Node));
13
14     new_node->data = new_data;
15
16     new_node->next = (*head_ref);
17
18     (*head_ref) = new_node;
19 }
20
21 void appendEnd(struct Node** head_ref, int new_data)
22 {
23 }
```

```
Linked-List.cpp
23
24     struct Node* new_node = (struct Node*) malloc(sizeof(struct Node));
25
26     struct Node *last = *head_ref;
27
28     new_node->data = new_data;
29
30     new_node->next = NULL;
31
32     if (*head_ref == NULL)
33     {
34         *head_ref = new_node;
35         return;
36     }
37
38     while (last->next != NULL)
39         last = last->next;
40
41     last->next = new_node;
42     return;
43 }
44
45 void printLinkL(struct Node *node)
```

LinkedList.cpp

```

43 }
44
45 void printLinkL(struct Node *node)
46 {
47     while (node != NULL)
48     {
49         printf(" %d ", node->data);
50         node = node->next;
51     }
52 }
53
54 int main()
55 {
56
57     struct Node* head = NULL;
58
59     while (1){
60         int choice;
61         printf("\n\nEnter 1 to add the elements of the Linked List from the Front : \n");
62         printf("\nEnter 2 to add the elements of the Linked List from the End : \n");
63         printf("\nEnter 3 to display the elements of the Linked List : \n");
64         printf("\nEnter 4 to exit the program : \n\n");
65
66         printf("Enter your choice : ");
67         scanf("%d", &choice);
68

```

LinkedList.cpp

```

67     scanf("%d", &choice);
68
69     switch(choice){
70     case 1: {
71         int newele = 0;
72         printf("\n\nEnter the element to be added from Front : \n");
73         scanf("%d", &newele);
74         push(&head, newele);
75         break;
76     }
77     case 2: {
78         int neweleLast = 0;
79         printf("\nEnter the element to be added from End : \n");
80         scanf("%d", &neweleLast);
81         appendEnd(&head, neweleLast);
82         break;
83     }
84     case 3: {
85         printf("\n The Linked List created is : \n\n");
86         printLinkL(head);
87         break;
88     }
89     case 4: {

```

[*] LinkedList.cpp

```

82         break;
83     }
84     case 3: {
85         printf("\n The Linked List created is : \n\n");
86         printLinkL(head);
87         break;
88     }
89     case 4: {
90         printf("The Program is Exited !!!\n\n");
91         exit(1);
92     }
93     default:
94         printf("\nInvalid choice\n");
95
96         break;
97     }
98
99 }
100
101 }
102 return 0;
103 }
104

```

Output:



```
E:\C-Programs\Linked-List.exe

Enter 1 to add the elements of the Linked List from the Front :
Enter 2 to add the elements of the Linked List from the End :
Enter 3 to display the elements of the Linked List :
Enter 4 to exit the program :
Enter your choice : 1

Enter the element to be added from Front :
26

Enter 1 to add the elements of the Linked List from the Front :
Enter 2 to add the elements of the Linked List from the End :
Enter 3 to display the elements of the Linked List :
Enter 4 to exit the program :
Enter your choice : 2

Enter the element to be added from End :
12

E:\C-Programs\Linked-List.exe

Enter 1 to add the elements of the Linked List from the Front :
Enter 2 to add the elements of the Linked List from the End :
Enter 3 to display the elements of the Linked List :
Enter 4 to exit the program :
Enter your choice : 1

Enter the element to be added from Front :
87

Enter 1 to add the elements of the Linked List from the Front :
Enter 2 to add the elements of the Linked List from the End :
Enter 3 to display the elements of the Linked List :
Enter 4 to exit the program :
Enter your choice : 3

The Linked List created is :

87 26 12
```

E:\C-Programs\Linked-List.exe

```
Enter 1 to add the elements of the Linked List from the Front :  
Enter 2 to add the elements of the Linked List from the End :  
Enter 3 to display the elements of the Linked List :  
Enter 4 to exit the program :  
Enter your choice : 1
```

```
Enter the element to be added from Front :  
100
```

```
Enter 1 to add the elements of the Linked List from the Front :  
Enter 2 to add the elements of the Linked List from the End :  
Enter 3 to display the elements of the Linked List :  
Enter 4 to exit the program :  
Enter your choice : 3
```

```
The Linked List created is :  
100 87 26 12
```

E:\C-Programs\Linked-List.exe

```
100 87 26 12  
Enter 1 to add the elements of the Linked List from the Front :  
Enter 2 to add the elements of the Linked List from the End :  
Enter 3 to display the elements of the Linked List :  
Enter 4 to exit the program :  
Enter your choice : 2
```

```
Enter the element to be added from End :  
200
```

```
Enter 1 to add the elements of the Linked List from the Front :  
Enter 2 to add the elements of the Linked List from the End :  
Enter 3 to display the elements of the Linked List :  
Enter 4 to exit the program :  
Enter your choice : 3
```

```
The Linked List created is :  
100 87 26 12 200
```

E:\C-Programs\Linked-List.exe

Enter your choice : 3

The Linked List created is :

100 87 26 12 200

Enter 1 to add the elements of the Linked List from the Front :

Enter 2 to add the elements of the Linked List from the End :

Enter 3 to display the elements of the Linked List :

Enter 4 to exit the program :

Enter your choice : 4

The Program is Exited !!!

Process exited after 1572 seconds with return value 1

Press any key to continue . . .