

LAB(18-11-2025)

INPUT

```
File Edit Selection View Go Run Terminal Help
C:\Users> BMSGCCSE > Desktop > 1BF24CS243 > C:\SLLC > main()
1 #include <stdio.h>
2 #include <stdlib.h>
3 struct Node{
4     int data;
5     struct Node *next;
6 };
7 struct Node *head = NULL;
8
9 //creating list
10 void createlist(int n)
11 {
12     struct Node *newNode, *temp;
13     int data, i;
14     if (n <= 0) {
15         printf("Number of nodes should be greater than 0. \n");
16         return;
17     }
18     for (i = 1; i <= n; i++) {
19         newNode = (struct Node*)malloc(sizeof(struct Node));
20         if (newNode == NULL) {
21             printf("Memory allocation failed. \n");
22             return;
23         }
24         printf("Enter data for node %d: ", i);
25         scanf("%d", &data);
26         newNode->data = data;
27         newNode->next = NULL;
28         if (head == NULL) {
29             head = newNode;
30         } else {
31             temp->next = newNode;
32         }
33         temp = newNode;
34     }
35     printf("\nlinked list created successfully \n");
36 }
37
38 //Inserting at beginning
39 void insertAtBeginning(int data)
40 {
41     struct Node *newNode = (struct Node*)malloc(sizeof(struct Node));
42     newNode->data = data;
43     newNode->next = head;
44     head = newNode;
45     printf("Node inserted at the beginning. \n");
46 }
47
48 //Inserting at end
```

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C:\Users> BMSGCCSE > Desktop > 1BF24CS243 > C:\SLLC > main()
39 void insertAtBeginning(int data)
47
48 //Inserting at end
49 void insertAtEnd(int data)
50 {
51     struct Node *newNode = (struct Node*)malloc(sizeof(struct Node));
52     newNode->data = data;
53     newNode->next = NULL;
54     if (head == NULL) {
55         head = newNode;
56     } else {
57         struct Node *temp = head;
58         while (temp->next != NULL)
59             temp = temp->next;
60         temp->next = newNode;
61     }
62     printf("Node inserted at the end. \n");
63 }
64
65 //Inserting at any position
66 void insertAtPosition(int data, int pos) {
67     int i;
68     struct Node *newNode, *temp = head;
69     if (pos < 1) {
70         printf("Invalid position. \n");
71         return;
72     }
73     if (pos == 1) {
74         insertAtBeginning(data);
75         return;
76     }
77     newNode = (struct Node*)malloc(sizeof(struct Node));
78     newNode->data = data;
79     for (i = 1; i < pos - 1 && temp != NULL; i++)
80         temp = temp->next;
81     if (temp == NULL) {
82         printf("Position out of range. \n");
83         free(newNode);
84     } else {
85         newNode->next = temp->next;
86         temp->next = newNode;
87         printf("Node inserted at position %d. \n", pos);
88     }
89 }
90
91 //deletion at beginning
92 void deleteAtBeginning() {
93     struct Node *temp;
```

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File Edit Selection View Go Run Terminal Help
C:\Users\BMSGICSE\Desktop> 1B24CS243 > @ SLLC > main()
66 void insertAtPosition(int data, int pos) {
67 }
68
69 //deletion at beginning
70 void deleteAtBeginning() {
71     struct Node *temp;
72     if(head == NULL) {
73         printf("List is empty\n");
74         return;
75     }
76     temp = head;
77     head = head->next;
78     free(temp);
79 }
80
81 //deletion at end
82 void deleteAtEnd() {
83     struct Node *temp, *prev;
84     if(head == NULL) {
85         printf("List is empty\n");
86         return;
87     }
88     if(head->next == NULL) {
89         free(head);
90         head = NULL;
91         return;
92     }
93     temp = head;
94     while(temp->next != NULL) {
95         prev = temp;
96         temp = temp->next;
97     }
98     prev->next = NULL;
99     free(temp);
100 }
101
102 //deletion at specific position
103 void deleteAtPosition(int pos) {
104     struct Node *temp, *del;
105     int i;
106     if(head == NULL) {
107         printf("List is empty\n");
108         return;
109     }
110     temp = head;
111     if(pos == 1) {
112         head = head->next;
113         free(temp);
114         return;
115     }
116     for(i = 1; i < pos-1; i++) {
117         temp = temp->next;
118     }
119     if(temp == NULL) {
120         printf("Invalid Position\n");
121         return;
122     }
123     del = temp->next;
124     temp->next = del->next;
125     free(del);
126 }
127
128 //display function
129 void displayList() {
130     struct Node *temp = head;
131     if(head == NULL) {
132         printf("List is empty. \n");
133         return;
134     }
135     printf("\nLinked list: ");
136     while(temp != NULL) {
137         printf("%d -> ", temp->data);
138         temp = temp->next;
139     }
140     printf("NULL\n");
141 }
142
143 //main function
144 int main() {
145     //insertion at beginning
146     insertAtBeginning(10);
147     insertAtBeginning(20);
148     insertAtBeginning(30);
149     //insertion at end
150     insertAtEnd(40);
151     insertAtEnd(50);
152     //insertion at specific position
153     insertAtPosition(60, 3);
154     //display the list
155     displayList();
156     //deletion at beginning
157     deleteAtBeginning();
158     //display the list
159     displayList();
160     //deletion at end
161     deleteAtEnd();
162     //display the list
163     displayList();
164     //deletion at specific position
165     deleteAtPosition(3);
166     //display the list
167     displayList();
168     return 0;
169 }
```

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File Edit Selection View Go Run Terminal Help
C:\Users\BMSGICSE\Desktop> 1B24CS243 > @ SLLC > main()
125 //deletion at specific position
126 void deleteAtPosition(int pos) {
127     struct Node *temp, *del;
128     int i;
129     if(head == NULL) {
130         printf("List is empty\n");
131         return;
132     }
133     temp = head;
134     if(pos == 1) {
135         head = head->next;
136         free(temp);
137         return;
138     }
139     for(i = 1; i < pos-1; i++) {
140         temp = temp->next;
141     }
142     if(temp == NULL) {
143         printf("Invalid Position\n");
144         return;
145     }
146     del = temp->next;
147     temp->next = del->next;
148     free(del);
149 }
150
151 //display function
152 void displayList() {
153     struct Node *temp = head;
154     if(head == NULL) {
155         printf("List is empty. \n");
156         return;
157     }
158     printf("\nLinked list: ");
159     while(temp != NULL) {
160         printf("%d -> ", temp->data);
161         temp = temp->next;
162     }
163     printf("NULL\n");
164 }
165
166 //main function
167 int main() {
168     //insertion at beginning
169     insertAtBeginning(10);
170     insertAtBeginning(20);
171     insertAtBeginning(30);
172     //insertion at end
173     insertAtEnd(40);
174     insertAtEnd(50);
175     //insertion at specific position
176     insertAtPosition(60, 3);
177     //display the list
178     displayList();
179     //deletion at beginning
180     deleteAtBeginning();
181     //display the list
182     displayList();
183     //deletion at end
184     deleteAtEnd();
185     //display the list
186     displayList();
187     //deletion at specific position
188     deleteAtPosition(3);
189     //display the list
190     displayList();
191     return 0;
192 }
```

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File Edit Selection View Go Run Terminal Help
C:\Users> BMSICSE > Desktop > IF24CS243 > SLLC > main()
156 void displayList() {
157
158
159 //mainfunction
160 int main()
161 {
162     int choice,n,data,pos;
163     while(1)
164     {
165         printf("--singly linked list--\n");
166         printf("1.create a linked list\n");
167         printf("2.insert at the beginning\n");
168         printf("3.insert at the any position\n");
169         printf("4.insert at the end\n");
170         printf("5.delete at beginning\n");
171         printf("6.delete at end\n");
172         printf("7.delete at specific position\n");
173         printf("8.display all the elements\n");
174         printf("9.exit\n");
175         printf("Enter urs choice\n");
176         scanf("%d",&choice);
177         switch(choice)
178         {
179             case 1: printf("enter the number of nodes");
180                     scanf("%d",&n);
181                     createList(n);
182                     break;
183             case 2: printf("enter the data to insert");
184                     scanf("%d",&data);
185                     insertAtBeginning(data);
186                     break;
187             case 3:
188                     printf("Enter data and position: ");
189                     scanf("%d %d", &data, &pos);
190                     insertAtPosition(data, pos);
191                     break;
192             case 4:
193                     printf("Enter data to insert: ");
194                     scanf("%d", &data);
195                     insertAtEnd(data);
196                     break;
197             case 5:
198                     deleteAtBeginning();
199                     break;
200             case 6:
201                     deleteAtEnd();
202                     break;
203             case 7:
204                     deleteAtPosition();
205                     break;
206             case 8:
207                     displayList();
208                     break;
209             case 9:
210                     exit(0);
211             default:
212                     printf("Invalid choice\n");
213         }
214     }
215 }
216
```

```
File Edit Selection View Go Run Terminal Help
C:\Users> BMSICSE > Desktop > IF24CS243 > SLLC > main()
179 int main()
180 {
181     while(1)
182     {
183         printf("9.exit\n");
184         printf("Enter urs choice\n");
185         scanf("%d",&choice);
186         switch(choice)
187         {
188             case 1: printf("enter the number of nodes");
189                     scanf("%d",&n);
190                     createList(n);
191                     break;
192             case 2: printf("enter the data to insert");
193                     scanf("%d",&data);
194                     insertAtBeginning(data);
195                     break;
196             case 3:
197                     printf("Enter data and position: ");
198                     scanf("%d %d", &data, &pos);
199                     insertAtPosition(data, pos);
200                     break;
201             case 4:
202                     printf("Enter data to insert: ");
203                     scanf("%d", &data);
204                     insertAtEnd(data);
205                     break;
206             case 5:
207                     deleteAtBeginning();
208                     break;
209             case 6:
210                     deleteAtEnd();
211                     break;
212             case 7:
213                     printf("Enter position to delete: ");
214                     scanf("%d", &pos);
215                     deleteAtPosition(pos);
216                     break;
217             case 8:
218                     displayList();
219                     break;
220             case 9:
221                     exit(0);
222             default:
223                     printf("Invalid choice\n");
224         }
225     }
226 }
227 return 0;
228
```

OUTPUT

```
File Edit Selection View Go Run Terminal Help
C:\Users\BMSCECSE\Desktop> 1BF24CS243 > C:\SLC> main()
171 int main()
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
PS C:\Users\BMSCECSE> cd "c:\Users\BMSCECSE\Desktop\1BF24CS243\output"
PS C:\Users\BMSCECSE> cd "c:\Users\BMSCECSE\Desktop\1BF24CS243\output"
PS C:\Users\BMSCECSE\Desktop\1BF24CS243\output> & .\SLL.exe
--singly linked list--
PS C:\Users\BMSCECSE> cd "c:\Users\BMSCECSE\Desktop\1BF24CS243\output"
PS C:\Users\BMSCECSE\Desktop\1BF24CS243\output> & .\SLL.exe
--singly linked list--
PS C:\Users\BMSCECSE> cd "c:\Users\BMSCECSE\Desktop\1BF24CS243\output"
PS C:\Users\BMSCECSE> cd "c:\Users\BMSCECSE\Desktop\1BF24CS243\output"
PS C:\Users\BMSCECSE\Desktop\1BF24CS243\output> & .\SLL.exe
--singly linked list--
1.create a linked list
PS C:\Users\BMSCECSE> cd "c:\Users\BMSCECSE\Desktop\1BF24CS243\output"
PS C:\Users\BMSCECSE> cd "c:\Users\BMSCECSE\Desktop\1BF24CS243\output"
PS C:\Users\BMSCECSE\Desktop\1BF24CS243\output> & .\SLL.exe
--singly linked list--
1.create a linked list
2.insert at the beginning
3.insert at the any positin
4.insert at the end
5.delete at beginning
6.delete at end
7.delete at specific position
8.display all the elements
9.exit
Enter urs choice
1
enter the number of nodes4
Enter data for node 1: 18
Enter data for node 2: 20
Enter data for node 3: 30
Enter data for node 4: 40
Linked list created successfully
--singly linked list--
1.create a linked list
2.insert at the beginning
3.insert at the any positin
4.insert at the end
5.delete at beginning
6.delete at end
7.delete at specific position
8.display all the elements
9.exit
Enter urs choice
5
--singly linked list--
1.create a linked list
2.insert at the beginning
3.insert at the any positin
4.insert at the end
5.delete at beginning
6.delete at end
```

```
File Edit Selection View Go Run Terminal Help
C:\Users\BMSCECSE\Desktop> 1BF24CS243 > C:\SLC> main()
171 int main()
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
--singly linked list--
1.create a linked list
2.insert at the beginning
3.insert at the any positin
4.insert at the end
5.delete at beginning
6.delete at end
7.delete at specific position
8.display all the elements
9.exit
Enter urs choice
5
--singly linked list--
1.create a linked list
2.insert at the beginning
3.insert at the any positin
4.insert at the end
5.delete at beginning
6.delete at end
7.delete at specific position
8.display all the elements
9.exit
Enter urs choice
7
Enter position to delete: 1
--singly linked list--
1.create a linked list
2.insert at the beginning
3.insert at the any positin
4.insert at the end
5.delete at beginning
6.delete at end
7.delete at specific position
8.display all the elements
9.exit
Enter urs choice
8
Linked List: 30 -> NULL
Ln 173, Col 11 Spaces: 4 UTF-8 CRLF C++ Signed out Win32
```

```
File Edit Selection View Go Run Terminal Help
C:\Users\BMGECSE\Desktop> 18F24CS243 > C:\SLLC > main()
177: int main()
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
6.delete at end
7.delete at specific position
8.display all the elements
9.exit
Enter urs choice
7
Enter position to delete: 1
--singly linked list--
1.create a linked list
2.insert at the beginning
3.insert at the any positin
4.insert at the end
5.delete at beginning
6.delete at end
7.delete at specific position
8.display all the elements
9.exit
Enter urs choice
8
Linked list: 30 -> NULL
--singly linked list--
1.create a linked list
2.insert at the beginning
3.insert at the any positin
4.insert at the end
5.delete at beginning
6.delete at end
7.delete at specific position
8.display all the elements
9.exit
Enter urs choice
9
PS C:\Users\BMGECSE\Desktop\18F24CS243> output:
```