

sllinsertion.c - Code::Blocks 20.03

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```
1 #include <stdio.h>
2 #include <stdlib.h>
3
4 struct Node {
5     int data;
6     struct Node* next;
7 }
8
9 struct Node* head = NULL;
10 struct Node* createNode(int data) {
11     struct Node* newNode = (struct Node*)malloc(sizeof(struct Node));
12     newNode->data = data;
13     newNode->next = NULL;
14     return newNode;
15 }
16 void displayList() {
17     struct Node* temp = head;
18     if (temp == NULL) {
19         printf("\nList is empty.\n");
20         return;
21     }
22     printf("\nLinked List: ");
23     while (temp != NULL) {
24         printf("%d ", temp->data);
25         temp = temp->next;
26     }
27     printf("\nNULL\n");
28 }
29 void insertAtBeginning(int data) {
30     struct Node* newNode = createNode(data);
31     newNode->next = head;
32     head = newNode;
33     printf("\nInserted %d at the beginning.\n", data);
34 }
35 void insertAtEnd(int data) {
36     struct Node* newNode = createNode(data);
37     if (head == NULL) {
38         head = newNode;
39     } else {
40         struct Node* temp = head;
41         while (temp->next != NULL)
42             temp = temp->next;
43         temp->next = newNode;
44     }
45     printf("\nInserted %d at the end.\n", data);
46 }
47 void insertAtPosition(int data, int position) {
48     if (position < 1) {
49         printf("\nInvalid position!\n");
50         return;
51     }
52     struct Node* newNode = createNode(data);
53     if (position == 1) {
```

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```
43     printf("\nInserted %d at the end.\n", data);
44 }
45 void insertAtPosition(int data, int position) {
46     if (position < 1) {
47         printf("\nInvalid position!\n");
48         return;
49     }
50     struct Node* newNode = createNode(data);
51     if (position == 1) {
52         newNode->next = head;
53         head = newNode;
54         printf("\nInserted %d at position %d.\n", data, position);
55         return;
56     }
57     struct Node* temp = head;
58     for (int i = 1; temp != NULL && i < position - 1; i++)
59     temp = temp->next;
60     if (temp == NULL) {
61         printf("\nPosition out of range!\n");
62         free(newNode);
63         return;
64     }
65     newNode->next = temp->next;
66     temp->next = newNode;
67     printf("\nInserted %d at position %d.\n", data, position);
68 }
69 int main() {
70     int choice, data, pos;
71     while (1) {
72         printf("\n==== Singly Linked List Menu ====\n");
73         printf("1. Insert at Beginning\n");
74         printf("2. Insert at End\n");
75         printf("3. Insert at Position\n");
76         printf("4. Display List\n");
77         printf("5. Exit\n");
78         printf("Enter your choice: ");
79         scanf("%d", &choice);
80
81         switch (choice) {
82             case 1:
83                 printf("Enter data: ");
84                 scanf("%d", &data);
85                 insertAtBeginning(data);
86                 break;
87             case 2:
88                 printf("Enter data: ");
89                 scanf("%d", &data);
90                 insertAtEnd(data);
91                 break;
92             case 3:
93                 printf("Enter data: ");
```

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```
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61     free(newNode);
62     return;
63 }
64 newNode->next = temp->next;
65 temp->next = newNode;
66 printf("\nInserted %d at position %d.\n", data, position);
67 }
68 int main() {
69     int choice, data, pos;
70     while (1) {
71         printf("\n==== Singly Linked List Menu ====\n");
72         printf("1. Insert at Beginning\n");
73         printf("2. Insert at End\n");
74         printf("3. Insert at Position\n");
75         printf("4. Display List\n");
76         printf("5. Exit\n");
77         printf("Enter your choice: ");
78         scanf("%d", &choice);
79
80         switch (choice) {
81             case 1:
82                 printf("Enter data: ");
83                 scanf("%d", &data);
84                 insertAtBeginning(data);
85                 break;
86             case 2:
87                 printf("Enter data: ");
88                 scanf("%d", &data);
89                 insertAtEnd(data);
90                 break;
91             case 3:
92                 printf("Enter data: ");
93                 scanf("%d", &data);
94                 printf("Enter position: ");
95                 scanf("%d", &pos);
96                 insertAtPosition(data, pos);
97                 break;
98             case 4:
99                 displayList();
100                break;
101            case 5:
102                printf("\nExiting program...\n");
103                exit(0);
104            default:
105                printf("\nInvalid choice! Try again.\n");
106            }
107        }
108    }
109
110    return 0;
111 }
112 }
```

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```
C:\Users\Admin\Desktop\slinsertion.exe
```

```
*** Singly Linked List Menu ***
```

- 1. Insert at Beginning
- 2. Insert at End
- 3. Insert at Position
- 4. Display List
- 5. Exit

```
Enter your choice: 1  
Enter data: 5
```

```
Inserted 5 at the beginning.
```

```
*** Singly Linked List Menu ***
```

- 1. Insert at Beginning
- 2. Insert at End
- 3. Insert at Position
- 4. Display List
- 5. Exit

```
Enter your choice: 1  
Enter data: 6
```

```
Inserted 6 at the beginning.
```

```
*** Singly Linked List Menu ***
```

- 1. Insert at Beginning
- 2. Insert at End
- 3. Insert at Position
- 4. Display List
- 5. Exit

```
Enter your choice: 4  
Enter data: 4
```

```
Linked List: 6 -> 5 -> NULL
```

```
*** Singly Linked List Menu ***
```

- 1. Insert at Beginning
- 2. Insert at End
- 3. Insert at Position
- 4. Display List
- 5. Exit

```
Enter your choice: 2  
Enter data: 20
```

```
Inserted 20 at the end.
```

```
*** Singly Linked List Menu ***
```

- 1. Insert at Beginning
- 2. Insert at End
- 3. Insert at Position
- 4. Display List
- 5. Exit

```
Enter your choice: 2  
Enter data: 30
```

```
Inserted 30 at the end.
```

```
*** Singly Linked List Menu ***
```

- 1. Insert at Beginning
- 2. Insert at End
- 3. Insert at Position
- 4. Display List
- 5. Exit

```
Enter your choice: 4  
Enter data: 4
```

```
Inserted 4 at the end.
```

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```
C:\Users\Admin\Desktop\slinsertion.exe
Inserted 20 at the end.

==> Singly Linked List Menu ==>
1. Insert at Beginning
2. Insert at End
3. Insert at Position
4. Display List
5. Exit
Enter your choice: 2
Enter data: 30

Inserted 30 at the end.

==> Singly Linked List Menu ==>
1. Insert at Beginning
2. Insert at End
3. Insert at Position
4. Display List
5. Exit
Enter your choice: 4

Linked List: 6 -> 5 -> 20 -> 30 -> NULL

==> Singly Linked List Menu ==>
1. Insert at Beginning
2. Insert at End
3. Insert at Position
4. Display List
5. Exit
Enter your choice: 3
Enter data: 77
Enter position: 4

Inserted 77 at position 4.

==> Singly Linked List Menu ==>
1. Insert at Beginning
2. Insert at End
3. Insert at Position
4. Display List
5. Exit
Enter your choice: 4

Linked List: 6 -> 5 -> 20 -> 77 -> 30 -> NULL

==> Singly Linked List Menu ==>
1. Insert at Beginning
2. Insert at End
3. Insert at Position
4. Display List
5. Exit
Enter your choice: 5

Exiting program..

Process returned 0 (0x0) execution time : 70.444 s
Press any key to continue.
```