Test cases – Self Organizing List

Changes made:

- ## Scenario 1:
    Previous:
    Insertion Output:
    ➢ If element found: "Element inserted successfully"

    Deletion Output:
    ➢ If deletion successful: "Element deleted successfully"

    After changes made:
    Insertion Output:
    For example, I insert 4:
    ➢ If element found: "Element 4 inserted successfully"

    Deletion Output:
    For example, I delete 4:
    ➢ If deletion successful: "Element 4 deleted successfully"

- ## Scenario 2:
    Previous:
    Segmentation fault:
    For Example,

    Insertion: 4, 5, 6, 7
    Display: 4 5 6 7

    Access: Searched 6
    Display: 6 4 5 7

    Searched 7
    Display output: 7 6 4 5
    Searched 5 (current last element)
    Segmentation fault

    After changes made: Developers rectified segmentation fault by adding the missed boundary condition and segmentation fault is rectified.

Test cases – Table description:

Function name	Pre-condition	Expected Result	Status
Insert	Integers are entered	Insertion successful	Passed
	If newnode allocation failed	Insertion failed	
Delete	Presence of pre-filled list	Deletion successful	Passed
	Empty list	Deletion Failed	
	Element not in list	Deletion Failed	
Access	Accessing element in the list	Element accessed	Passed
	Accessing element not in the list	Element not found	
Display	No elements	List is empty	Passed
	Display before accessing	Unchanged list is displayed	
	Display after accessing	Accessed element displayed first and rest unchanged	

- ## Checking the following conditions:

1. **Insert:**
   a) Inserting into an empty list.
   b) Inserting more elements.

2. **Delete:**
   a) Deleting from empty list.
   b) Deleting elements from beginning, middle and end.
   c) Deleting an element not in list.
   d) Deleting all elements in the list.

3. **Access:**
   a) Accessing element already at the front of the list.
   b) Accessing elements that are at different positions in the list.
   c) Accessing elements that are not present in the list.

4. **Display:**
   a) Display an empty list.
   b) Display with one element.
   c) Display with multiple elements.

1. Insertion:

a. Inserting into empty list:

```
Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 4

The list is empty.

Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 1

Enter number to insert: 12
Element 12 inserted successfully.

Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 5
Program exited
```

b) Inserting more elements:

```
Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 1

Enter number to insert: 12
Element 12 inserted successfully.
```

```
Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 1

Enter number to insert: 23
Element 23 inserted successfully.

Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 1

Enter number to insert: 34
Element 34 inserted successfully.

Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 1

Enter number to insert: 45
Element 45 inserted successfully.
Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 4

Contents of the self organising list:
12 23 34 45

Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 5
Program exited
```

2. Deletion:

a. Deleting element from empty list:

```
Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 4

The list is empty.

Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 2

Enter number to delete: 12
Deletion failed.
```

b. Deleting elements from beginning, middle and end:

i) Deleting a middle element:

```
Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 4

Contents of the self organising list:
12 23 34 45

Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 2

Enter number to delete: 23
Element 23 deleted successfully.
```

```
Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 4

Contents of the self organising list:
12 34 45
```

ii) Deleting an element in the beginning:

```
Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 4

Contents of the self organising list:
12 34 45 56 67

Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 2

Enter number to delete: 12
Element 12 deleted successfully.

Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 4

Contents of the self organising list:
34 45 56 67
```

iii) Deleting an element in the end:

```
Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 4

Contents of the self organising list:
12 23 34 45 56

Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 2

Enter number to delete: 56
Element 56 deleted successfully.
```

c) Deleting an element not in list:

```
Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 4

Contents of the self organising list:
34 45 56 67

Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 2

Enter number to delete: 89
Deletion failed.
```

d) Deleting all elements in a list:

```
Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 4

Contents of the self organising list:
34 45 56 67

Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 2

Enter number to delete: 34
Element 34 deleted successfully.

Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 2

Enter number to delete: 45
Element 45 deleted successfully.

Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 2

Enter number to delete: 67
Element 67 deleted successfully.
```

```
Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 2

Enter number to delete: 56
Element 56 deleted successfully.

Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 2

Enter number to delete: 55
Deletion failed.

Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 4

The list is empty.
```

3. Access:

a) Accessing element already at the front of the list:

```
Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 4

Contents of the self organising list:
12 23 34 45 56

Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 3

Enter number to access: 12
Element 12 accessed.

Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 4

Contents of the self organising list:
12 23 34 45 56
```

b) Accessing elements that are at different positions in the list:

```
Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 4

Contents of the self organising list:
34 12 23 45 56

Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 3

Enter number to access: 56
Element 56 accessed.

Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 4

Contents of the self organising list:
56 34 12 23 45
```

```
Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 4
```

```
Contents of the self organising list:
12 23 34 45 56

Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 3

Enter number to access: 34
Element 34 accessed.

Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 4

Contents of the self organising list:
34 12 23 45 56
```

c) Accessing elements that are not present in the list:

```
Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 4

Contents of the self organising list:
56 34 12 23 45

Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 3

Enter number to access: 98
Element 98 not found.
```

4. Display:

a) Displaying an empty list:

```
Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 4

The list is empty.
```

b) Display with one element:

```
Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 1

Enter number to insert: 12
Element 12 inserted successfully.

Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 4

Contents of the self organising list:
12
```

c) Display a list with multiple elements:

```
Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 1

Enter number to insert: 12
Element 12 inserted successfully.

Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 1

Enter number to insert: 23
Element 23 inserted successfully.

Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 1

Enter number to insert: 34
Element 34 inserted successfully.

Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 1

Enter number to insert: 45
Element 45 inserted successfully.
```

```
Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 4

Contents of the self organising list:
12 23 34 45

Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 5
Program exited
```

Combined test case:

```
Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 1

Enter number to insert: 12
Element 12 inserted successfully.

Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 1

Enter number to insert: 23
Element 23 inserted successfully.

Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 4

Contents of the self organising list:
12 23

Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 3

Enter number to access: 23
Element 23 accessed.
```

```
Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 4

Contents of the self organising list:
23 12

Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 1

Enter number to insert: 34
Element 34 inserted successfully.

Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 4

Contents of the self organising list:
23 12 34
```

```
Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 2

Enter number to delete: 12
Element 12 deleted successfully.
```

```
Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 4

Contents of the self organising list:
23 34

Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 1

Enter number to insert: 55
Element 55 inserted successfully.

Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 4

Contents of the self organising list:
23 34 55
```

```
Menu:
1. Insert
2. Delete
3. Access
4. Display
5. Exit
Enter your choice: 5
Program exited
```