CS401 Lab 8: Linked List Data Structure Implementations

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Part 1: Sorted Linked List

1. **Eclipse**

```
Sorted Linked List Contents:
 [Employee Name: John Smith, ID: 1001]
 [Employee Name: Emma Johnson, ID: 1002]
 [Employee Name: Michael Brown, ID: 1003]
 [Employee Name: Sarah Davis, ID: 1004]
 [Employee Name: David Wilson, ID: 1005]
 [Employee Name: Jennifer Taylor, ID: 1006]
 [Employee Name: Christopher Anderson, ID: 1007]
 [Employee Name: Lisa Thomas, ID: 1008]
 [Employee Name: Matthew Jackson, ID: 1009]
 [Employee Name: Olivia White, ID: 1010]
 [Employee Name: Daniel Martinez, ID: 1011]
 [Employee Name: Sophia Garcia, ID: 1012]
 [Employee Name: James Robinson, ID: 1013]
 [Employee Name: Emily Clark, ID: 1014]
 [Employee Name: Robert Lewis, ID: 1015]
 [Employee Name: Ava Lee, ID: 1016]
 [Employee Name: William Walker, ID: 1017]
 [Employee Name: Mia Hall, ID: 1018]
 [Employee Name: Joseph Allen, ID: 1019]
 [Employee Name: Isabella Young, ID: 1020]
 [Employee Name: Richard King, ID: 1021]
 [Employee Name: Abigail Wright, ID: 1022]
 [Employee Name: Thomas Scott, ID: 1023]
 [Employee Name: Grace Green, ID: 1024]
 [Employee Name: Charles Baker, ID: 1025]
 [Employee Name: Chloe Adams, ID: 1026]
 [Employee Name: Andrew Nelson, ID: 1027]
 [Employee Name: Ella Mitchell, ID: 1028]
 [Employee Name: Ryan Carter, ID: 1029]
 [Employee Name: Lily Phillips, ID: 1030]
```

```
Try to add an employee.
This ID is already occupied.

Adding this ID is successful.
Sorted Linked List Contents After Adding ID 1031:
 [Employee Name: John Smith, ID: 1001]
 [Employee Name: Emma Johnson, ID: 1002]
 [Employee Name: Michael Brown, ID: 1003]
 [Employee Name: Sarah Davis, ID: 1004]
 [Employee Name: David Wilson, ID: 1005]
 [Employee Name: Jennifer Taylor, ID: 1006]
 [Employee Name: Christopher Anderson, ID: 1007]
 [Employee Name: Lisa Thomas, ID: 1008]
 [Employee Name: Matthew Jackson, ID: 1009]
 [Employee Name: Olivia White, ID: 1010]
 [Employee Name: Daniel Martinez, ID: 1011]
 [Employee Name: Sophia Garcia, ID: 1012]
 [Employee Name: James Robinson, ID: 1013]
 [Employee Name: Emily Clark, ID: 1014]
 [Employee Name: Robert Lewis, ID: 1015]
 [Employee Name: Ava Lee, ID: 1016]
 [Employee Name: William Walker, ID: 1017]
 [Employee Name: Mia Hall, ID: 1018]
 [Employee Name: Joseph Allen, ID: 1019]
 [Employee Name: Isabella Young, ID: 1020]
 [Employee Name: Richard King, ID: 1021]
 [Employee Name: Abigail Wright, ID: 1022]
 [Employee Name: Thomas Scott, ID: 1023]
 [Employee Name: Grace Green, ID: 1024]
 [Employee Name: Charles Baker, ID: 1025]
 [Employee Name: Chloe Adams, ID: 1026]
 [Employee Name: Andrew Nelson, ID: 1027]
 [Employee Name: Ella Mitchell, ID: 1028]
 [Employee Name: Ryan Carter, ID: 1029]
 [Employee Name: Lily Phillips, ID: 1030]
 [Employee Name: Seonghwan Lim, ID: 1031]
```

```
Try to remove an employee.
Removing this employee is successful.
Sorted Linked List Contents After Deleting ID 1001:
 [Employee Name: Emma Johnson, ID: 1002]
 [Employee Name: Michael Brown, ID: 1003]
 [Employee Name: Sarah Davis, ID: 1004]
 [Employee Name: David Wilson, ID: 1005]
 [Employee Name: Jennifer Taylor, ID: 1006]
 [Employee Name: Christopher Anderson, ID: 1007]
 [Employee Name: Lisa Thomas, ID: 1008]
 [Employee Name: Matthew Jackson, ID: 1009]
 [Employee Name: Olivia White, ID: 1010]
 [Employee Name: Daniel Martinez, ID: 1011]
 [Employee Name: Sophia Garcia, ID: 1012]
 [Employee Name: James Robinson, ID: 1013]
 [Employee Name: Emily Clark, ID: 1014]
 [Employee Name: Robert Lewis, ID: 1015]
 [Employee Name: Ava Lee, ID: 1016]
 [Employee Name: William Walker, ID: 1017]
 [Employee Name: Mia Hall, ID: 1018]
 [Employee Name: Joseph Allen, ID: 1019]
 [Employee Name: Isabella Young, ID: 1020]
 [Employee Name: Richard King, ID: 1021]
 [Employee Name: Abigail Wright, ID: 1022]
 [Employee Name: Thomas Scott, ID: 1023]
 [Employee Name: Grace Green, ID: 1024]
 [Employee Name: Charles Baker, ID: 1025]
 [Employee Name: Chloe Adams, ID: 1026]
 [Employee Name: Andrew Nelson, ID: 1027]
 [Employee Name: Ella Mitchell, ID: 1028]
 [Employee Name: Ryan Carter, ID: 1029]
 [Employee Name: Lily Phillips, ID: 1030]
 [Employee Name: Seonghwan Lim, ID: 1031]
```

2. JAR

```
Sorted Linked List Contents:
 [Employee Name: John Smith, ID: 1001]
 [Employee Name: Emma Johnson, ID: 1002]
 [Employee Name: Michael Brown, ID: 1003]
 [Employee Name: Sarah Davis, ID: 1004]
 [Employee Name: David Wilson, ID: 1005]
 [Employee Name: Jennifer Taylor, ID: 1006]
 [Employee Name: Christopher Anderson, ID: 1007]
 [Employee Name: Lisa Thomas, ID: 1008]
 [Employee Name: Matthew Jackson, ID: 1009]
 [Employee Name: Olivia White, ID: 1010]
 [Employee Name: Daniel Martinez, ID: 1011]
 [Employee Name: Sophia Garcia, ID: 1012]
 [Employee Name: James Robinson, ID: 1013]
 [Employee Name: Emily Clark, ID: 1014]
 [Employee Name: Robert Lewis, ID: 1015]
 [Employee Name: Ava Lee, ID: 1016]
 [Employee Name: William Walker, ID: 1017]
 [Employee Name: Mia Hall, ID: 1018]
 [Employee Name: Joseph Allen, ID: 1019]
 [Employee Name: Isabella Young, ID: 1020]
 [Employee Name: Richard King, ID: 1021]
 [Employee Name: Abigail Wright, ID: 1022]
 [Employee Name: Thomas Scott, ID: 1023]
 [Employee Name: Grace Green, ID: 1024]
 [Employee Name: Charles Baker, ID: 1025]
 [Employee Name: Chloe Adams, ID: 1026]
 [Employee Name: Andrew Nelson, ID: 1027]
 [Employee Name: Ella Mitchell, ID: 1028]
 [Employee Name: Ryan Carter, ID: 1029]
 [Employee Name: Lily Phillips, ID: 1030]
```

```
Try to add an employee.
This ID is already occupied.

Adding this ID is successful.
Sorted Linked List Contents After Adding ID 1031:
 [Employee Name: John Smith, ID: 1001]
 [Employee Name: Emma Johnson, ID: 1002]
 [Employee Name: Michael Brown, ID: 1003]
 [Employee Name: Sarah Davis, ID: 1004]
 [Employee Name: David Wilson, ID: 1005]
 [Employee Name: Jennifer Taylor, ID: 1006]
 [Employee Name: Christopher Anderson, ID: 1007]
 [Employee Name: Lisa Thomas, ID: 1008]
 [Employee Name: Matthew Jackson, ID: 1009]
 [Employee Name: Olivia White, ID: 1010]
 [Employee Name: Daniel Martinez, ID: 1011]
 [Employee Name: Sophia Garcia, ID: 1012]
 [Employee Name: James Robinson, ID: 1013]
 [Employee Name: Emily Clark, ID: 1014]
 [Employee Name: Robert Lewis, ID: 1015]
 [Employee Name: Ava Lee, ID: 1016]
 [Employee Name: William Walker, ID: 1017]
 [Employee Name: Mia Hall, ID: 1018]
 [Employee Name: Joseph Allen, ID: 1019]
 [Employee Name: Isabella Young, ID: 1020]
 [Employee Name: Richard King, ID: 1021]
 [Employee Name: Abigail Wright, ID: 1022]
 [Employee Name: Thomas Scott, ID: 1023]
 [Employee Name: Grace Green, ID: 1024]
 [Employee Name: Charles Baker, ID: 1025]
 [Employee Name: Chloe Adams, ID: 1026]
 [Employee Name: Andrew Nelson, ID: 1027]
 [Employee Name: Ella Mitchell, ID: 1028]
 [Employee Name: Ryan Carter, ID: 1029]
 [Employee Name: Lily Phillips, ID: 1030]
 [Employee Name: Seonghwan Lim, ID: 1031]
```

```
Try to remove an employee.
Removing this employee is successful.
Sorted Linked List Contents After Deleting ID 1001:
 [Employee Name: Emma Johnson, ID: 1002]
 [Employee Name: Michael Brown, ID: 1003]
 [Employee Name: Sarah Davis, ID: 1004]
 [Employee Name: David Wilson, ID: 1005]
 [Employee Name: Jennifer Taylor, ID: 1006]
 [Employee Name: Christopher Anderson, ID: 1007]
 [Employee Name: Lisa Thomas, ID: 1008]
 [Employee Name: Matthew Jackson, ID: 1009]
 [Employee Name: Olivia White, ID: 1010]
 [Employee Name: Daniel Martinez, ID: 1011]
 [Employee Name: Sophia Garcia, ID: 1012]
 [Employee Name: James Robinson, ID: 1013]
 [Employee Name: Emily Clark, ID: 1014]
 [Employee Name: Robert Lewis, ID: 1015]
 [Employee Name: Ava Lee, ID: 1016]
 [Employee Name: William Walker, ID: 1017]
 [Employee Name: Mia Hall, ID: 1018]
 [Employee Name: Joseph Allen, ID: 1019]
 [Employee Name: Isabella Young, ID: 1020]
 [Employee Name: Richard King, ID: 1021]
 [Employee Name: Abigail Wright, ID: 1022]
 [Employee Name: Thomas Scott, ID: 1023]
 [Employee Name: Grace Green, ID: 1024]
 [Employee Name: Charles Baker, ID: 1025]
 [Employee Name: Chloe Adams, ID: 1026]
 [Employee Name: Andrew Nelson, ID: 1027]
 [Employee Name: Ella Mitchell, ID: 1028]
 [Employee Name: Ryan Carter, ID: 1029]
 [Employee Name: Lily Phillips, ID: 1030]
 [Employee Name: Seonghwan Lim, ID: 1031]
```

Part 2: Circular Linked List

1. Eclipse

```
Initial Circular List:
[Employee Name: Emma Johnson, ID: 1002] -> [Employee Name: Jennifer Taylor, ID: 1006] -> [Employee Name: Matthew Jackson, ID: 1009] -> [Employee Name: Daniel

Try to remove an employee with ID 1002.
Removing this employee is successful.
After Deleting ID 1002:
[Employee Name: Jennifer Taylor, ID: 1006] -> [Employee Name: Matthew Jackson, ID: 1009] -> [Employee Name: Daniel Martinez, ID: 1011] -> [Employee Name: Wil
```

```
ID: 1017] -> [Employee Name: Thomas Scott, ID: 1023] -> [Employee Name: Grace Green, ID: 1024] -> [Employee Name: Lily Phillips, ID: 1030] -> (back to start)



ID: 1023] -> [Employee Name: Grace Green, ID: 1024] -> [Employee Name: Lily Phillips, ID: 1030] -> (back to start)
```

2. JAR

```
Initial Circular List:
[Employee Name: Emma Johnson, ID: 1002] -> [Employee Name: Jennifer Taylor, ID: 1006] -> [Employee Name: Matthew Jackson, ID: 1009] -> [Employee Name: Danie
l Martinez, ID: 1011] -> [Employee Name: William Walker, ID: 1017] -> [Employee Name: Thomas Scott, ID: 1023] -> [Employee Name: Grace Green, ID: 1024] -> [
Employee Name: Lily Phillips, ID: 1030] -> (back to start)

Try to remove an employee with ID 1002.
Removing this employee is successful.
After Deleting ID 1002:
[Employee Name: Jennifer Taylor, ID: 1006] -> [Employee Name: Matthew Jackson, ID: 1009] -> [Employee Name: Daniel Martinez, ID: 1011] -> [Employee Name: Wi
lliam Walker, ID: 1017] -> [Employee Name: Thomas Scott, ID: 1023] -> [Employee Name: Grace Green, ID: 1024] -> [Employee Name: Lily Phillips, ID: 1030] ->
(back to start)
```

Part 3: Doubly Linked List

1. Eclipse

```
Forward Traversal:
1 2 3 4 5
Backward Traversal:
5 4 3 2 1
```

2. JAR

```
Forward Traversal:
1 2 3 4 5
Backward Traversal:
5 4 3 2 1
```