

2020FA Data Struc & Algor (CIS-277-601HY)

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Test II: Dynamic Linked List Project

[Menu]

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
```

1. Create

a) When a **Linked list is not created**, any functions should not be executed.

[**Add** should not be executed but print the message.]

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
2
Create Linked list first.
```

[Delete should not be executed but print the message.]

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
③
Create Linked list first.
```

[Display should not be executed but print the message.]

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
④
Create Linked list first.
```

[Modify should not be executed but print the message.]

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
⑤
Create Linked list first.
```

[**Purge** should not be executed but print the message.]

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
6
Create Linked list first.
```

[**Search** should not be executed but print the message.]

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
7
Create Linked list first.
```

b) **When a linked list is created**, the message should be printed. (Checklist 1)

[Linked list is created and print the message.]

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
1
Linked list is created.
```

c) After a Linked list is created, the linked list is still empty. So, any functions except Add should not be executed but print message: empty.

[Delete should not be executed but print the message.]

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
3
Linked list is empty.
```

[Display should not be executed but print the message.]

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
4
Linked list is empty.
```

[Modify should not be executed but print the message.]

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
5
Linked list is empty.
```

[**Purge** should not be executed but print the message.]

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
6
Linked list is empty.
```

[**Search** should not be executed but print the message.]

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
7
Linked list is empty.
```

2. Add & Display

- Now Linked list is created. Nodes will be added to the linked list.

a) When the list is empty. : Print the message

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
4
Linked list is empty.
```

b) Checklist 2. Add a node to an empty LL

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
2
Please enter ID: 283
Please enter GPA: 2.3
Please enter Name: David kim
New list is added.
```

[Display the linked list to check if the node is added.]

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
4
ID: 283 | GPA: 2.3 | NAME: David kim
```

c) Checklist 3. Add a node to the front of the LL

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
2
Please enter ID: 123
Please enter GPA: 3.4
Please enter Name: John watson
New list is added.
```

[Display the linked list to check whether the node is added at the beginning.]

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
4
ID: 123 | GPA: 3.4 | NAME: John watson
ID: 283 | GPA: 2.3 | NAME: David kim ]
```

d) Checklist 4. Add a node to the end of the LL

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
2
Please enter ID: 345
Please enter GPA: 2.9
Please enter Name: Joy matt
New list is added.
```

[Display the linked list to check if the node is added at the end.]

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
4
ID: 123 | GPA: 3.4 | NAME: John watson
ID: 283 | GPA: 2.3 | NAME: David kim
ID: 345 | GPA: 2.9 | NAME: Joy matt
```

e) Checklist 6. Add a node to somewhere between the first and last of the linked list.

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
2
Please enter ID: 234
Please enter GPA: 3.8
Please enter Name: Kye lee
New list is added.
```

[Display the linked list to check if the node is added somewhere in the middle.]

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
4
ID: 123 | GPA: 3.4 | NAME: John watson
ID: 234 | GPA: 3.8 | NAME: Kye lee
ID: 283 | GPA: 2.3 | NAME: David kim
ID: 345 | GPA: 2.9 | NAME: Joy matt
```

[Add a new node somewhere between the beginning and the end of the linked list.]

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
2
Please enter ID: 301
Please enter GPA: 3.9
Please enter Name: Emma park
New list is added.
```

[Display the linked list to check whether the node is added somewhere in the middle.]

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
4
ID: 123 | GPA: 3.4 | NAME: John watson
ID: 234 | GPA: 3.8 | NAME: Kye lee
ID: 283 | GPA: 2.3 | NAME: David kim
ID: 301 | GPA: 3.9 | NAME: Emma park
ID: 345 | GPA: 2.9 | NAME: Joy matt
```


f) Duplicated ID should not be added and print the message. (Checklist 5)

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
2
Please enter ID: 234
Please enter GPA: 3.4
Please enter Name: julian yoo
Duplicate ID found. Please enter other ID.
```

3. Delete & Display

- If the linked list is not empty, the node matching ID will be deleted from the linked list.

a) When the list is empty. : Print the message (Checklist 7)

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
4
Linked list is empty.
```

b) When the linked list is not empty and has nodes, display the current linked list.

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
4
ID: 123 | GPA: 3.4 | NAME: John watson
ID: 234 | GPA: 3.8 | NAME: Kye lee
ID: 283 | GPA: 2.3 | NAME: David kim
ID: 301 | GPA: 3.9 | NAME: Emma park
ID: 345 | GPA: 2.9 | NAME: Joy matt
```

c) Delete the node at the beginning of the linked list.(Checklist 8)

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
3
Please enter ID: 123
List is deleted.
```

[Display to check if the node at the beginning is deleted = Yes]

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
4
ID: 234 | GPA: 3.8 | NAME: Kye lee
ID: 283 | GPA: 2.3 | NAME: David kim
ID: 301 | GPA: 3.9 | NAME: Emma park
ID: 345 | GPA: 2.9 | NAME: Joy matt
```

d) Delete the node at the end of the linked list.(Checklist 9)

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
3
Please enter ID: 345
List is deleted.
```

[Display to check if the node at the end of linked list is deleted = Yes]

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
4
ID: 234 | GPA: 3.8 | NAME: Kye lee
ID: 283 | GPA: 2.3 | NAME: David kim
ID: 301 | GPA: 3.9 | NAME: Emma park
```

e) Delete the node at the middle of the linked list.(Checklist 10)

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
3
Please enter ID: 283
List is deleted.
```

[Display to check if the node at the middle of the linked list is deleted = Yes]

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
4
ID: 234 | GPA: 3.8 | NAME: Kye lee
ID: 301 | GPA: 3.9 | NAME: Emma park
```

f) Not existing ID should not be deleted but print the message.

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
3
Please enter ID: 100
No matching ID exist.
```

5. Modify & Display

- The node matching with ID will be modified.

[Display current linked list.]

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
4
ID: 234 | GPA: 3.8 | NAME: Kye lee
ID: 301 | GPA: 3.9 | NAME: Emma park
```

[Add 4 more nodes to modify the node at the beginning, middle, end of the linked list]

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
2
Please enter ID: 283
Please enter GPA: 3.1
Please enter Name: kyla min
New list is added.

Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
2
Please enter ID: 420
Please enter GPA: 2.9
Please enter Name: grace oh
New list is added.

Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
2
Please enter ID: 429
Please enter GPA: 3.5
Please enter Name: Tony yoon
New list is added.

Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
2
Please enter ID: 159
Please enter GPA: 2.3
Please enter Name: Peter cha
New list is added.
```

[Display linked list again with new nodes]

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
4
ID: 159 | GPA: 2.3 | NAME: Peter cha
ID: 234 | GPA: 3.8 | NAME: Kye lee
ID: 283 | GPA: 3.1 | NAME: kyla min
ID: 301 | GPA: 3.9 | NAME: Emma park
ID: 420 | GPA: 2.9 | NAME: grace oh
ID: 429 | GPA: 3.5 | NAME: Tony yoon
```

a) **Modify the node matching with ID and display the node before and after modification.** .(Checklist 13)

[Modify the **Front node** and Display]

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
5
Please enter ID: 159
Please enter GPA: 3.8
Please enter Name: Roy kim
We found matching ID.
ID: 159 | GPA: 2.3 | NAME: Peter cha

The ID info has been modified like below.
ID: 159 | GPA: 3.8 | NAME: Roy kim

Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
4
ID: 159 | GPA: 3.8 | NAME: Roy kim
ID: 234 | GPA: 3.8 | NAME: Kye lee
ID: 283 | GPA: 3.1 | NAME: kyla min
ID: 301 | GPA: 3.9 | NAME: Emma park
ID: 420 | GPA: 2.9 | NAME: grace oh
ID: 429 | GPA: 3.5 | NAME: Tony yoon
```

[Modify the **Middle node** and Display]

Enter command

1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit

5

Please enter ID: 283

Please enter GPA: 2.8

Please enter Name: kimmy jay

We found matching ID.

ID: 283 | GPA: 3.1 | NAME: kyla min

The ID info has been modified like below.

ID: 283 | GPA: 2.8 | NAME: kimmy jay

Enter command

1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit

4

ID: 159		GPA: 3.8		NAME: Roy kim
ID: 234		GPA: 3.8		NAME: Kye lee
ID: 283		GPA: 2.8		NAME: kimmy jay
ID: 301		GPA: 3.9		NAME: Emma park
ID: 420		GPA: 2.9		NAME: grace oh
ID: 429		GPA: 3.5		NAME: Tony yoon

[Modify the **End node** and Display]

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
5
Please enter ID: 429
Please enter GPA: 3.2
Please enter Name: Timo oh
We found matching ID.
ID: 429 | GPA: 3.5 | NAME: Tony yoon

The ID info has been modified like below.
ID: 429 | GPA: 3.2 | NAME: Timo oh

Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
4
ID: 159 | GPA: 3.8 | NAME: Roy kim
ID: 234 | GPA: 3.8 | NAME: Kye lee
ID: 283 | GPA: 2.8 | NAME: kimmy jay
ID: 301 | GPA: 3.9 | NAME: Emma park
ID: 420 | GPA: 2.9 | NAME: grace oh
ID: 429 | GPA: 3.2 | NAME: Timo oh
```

b) **Not existing ID can not be modified:** print the message.

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
5
Please enter ID: 100
Please enter GPA: 3.9
Please enter Name: kelly kim
No matching ID exist.
There is no matching ID.
```

7. Search & Display

- The node matching with ID will be searched and displayed the information in the node.

[Display the linked list.]

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
4
ID: 159 | GPA: 3.8 | NAME: Roy kim
ID: 234 | GPA: 3.8 | NAME: Kye lee
ID: 283 | GPA: 2.8 | NAME: kimmy jay
ID: 301 | GPA: 3.9 | NAME: Emma park
ID: 420 | GPA: 2.9 | NAME: grace oh
ID: 429 | GPA: 3.2 | NAME: Timo oh
```

a) Search the node matching with ID and display the information in the node.

(Checklist 11)

[Search the **Front node**]

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
7
Please enter ID: 159
We found matching ID.
ID: 159 | GPA: 3.8 | NAME: Roy kim
```


[Search the **Middle node**]

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
7
Please enter ID: 301
We found matching ID.
ID: 301 | GPA: 3.9 | NAME: Emma park
```

[Search the **End node**]

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
7
Please enter ID: 429
We found matching ID.
ID: 429 | GPA: 3.2 | NAME: Timo oh
```

b) **Search not existing ID can not be searched.**(Checklist 12)

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
7
Please enter ID: 100
No matching ID exist.
```

6. Purge & Display (Checklist 14. Purge the LL)

- The entire linked list will be purged.

a) Display and Purge the entire list.

[illegible]

b) After purging the entire linked list, the linked list is empty.

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
4
Linked list is empty.
```

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
3
Linked list is empty.
```

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
5
Linked list is empty.
```

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
7
Linked list is empty.
```

c) After purging, if the user chooses “1. Create”, it will print the message: already created.

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
1
Linked list is already created
```

8. Exit

[Exit the program]

```
Enter command
1. Create
2. Add
3. Delete
4. Display
5. Modify
6. Purge entire list
7. Search for node
8. Exit
8
hyejinkim@HyeJins-iMac test2 %
```