

LAB ASSIGNMENT – 7

You are required to submit two python files one is for CircularSinglyLinkedList and another one is for CircularDoublyLinkedList. Both files must be python files with “.py” extension.

File – 1 for CircularSinglyLinkedList

Do follow the following requirements for both the files and submit it via Gradescope Lab Assignment 7.

Class: Node

Represents a node in the circular singly linked list.

Constructor: `__init__(self, data)`

- **Parameters:**
 - `data` (any type): The value stored in the node.
 - **Attributes:**
 - `self.data`: Stores the node's data.
 - `self.next`: Points to the next node (initially `None`).
 - **Return Type:** `None`
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Class: CircularSinglyLinkedList

Implements a circular singly linked list.

Constructor: `__init__(self)`

- **Parameters:** `None`
 - **Attributes:**
 - `self.head`: Stores the reference to the first node in the list (initially `None`).
 - **Return Type:** `None`
-

Method: `insert_first(self, data)`

Inserts a new node at the beginning of the list.

- **Parameters:**
 - `data` (any type): The value to be inserted.
- **Return Type:** `None`

Method: `insert_last(self, data)`

Inserts a new node at the end of the list.

- **Parameters:**
 - `data` (any type): The value to be inserted.
 - **Return Type:** `None`
-

Method: `delete_first(self)`

Deletes the first node in the list.

- **Parameters:** `None`
 - **Return Type:** `None`
-

Method: `delete_last(self)`

Deletes the last node in the list.

- **Parameters:** `None`
- **Return Type:** `None`

File 2 for CircularDoublyLinkedList

Class: Node

Represents a node in the circular doubly linked list.

Constructor: `__init__(self, data)`

- **Parameters:**
 - `data` (any type): The value stored in the node.
 - **Attributes:**
 - `self.data`: Stores the node's data.
 - `self.next`: Points to the next node (initially `None`).
 - `self.prev`: Points to the previous node (initially `None`).
 - **Return Type:** `None`
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Class: CircularDoublyLinkedList

Implements a circular doubly linked list.

Constructor: `__init__(self)`

- **Parameters:** `None`
 - **Attributes:**
 - `self.head`: Stores the reference to the first node in the list (initially `None`).
 - **Return Type:** `None`
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Method: `insert_first(self, data)`

Inserts a new node at the beginning of the list.

- **Parameters:**
 - `data` (any type): The value to be inserted.
 - **Return Type:** `None`
-

Method: `insert_last(self, data)`

Inserts a new node at the end of the list.

- **Parameters:**
 - `data` (any type): The value to be inserted.
 - **Return Type:** `None`
-

Method: `delete_first(self)`

Deletes the first node in the list.

- **Parameters:** `None`
 - **Return Type:** `None`
-

Method: `delete_last(self)`

Deletes the last node in the list.

- **Parameters:** `None`
- **Return Type:** `None`