GROUP 4

CYCLIC DOUBLY LINKED LIST

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CYCLIC DOUBLY LINKED LIST

- Contains properties of both a doubly linked list and a cyclic linked list
- A linked list is a linear data structure that links consecutive nodes
- The nodes in a doubly linked list have pointers to both the next and previous node in the list
- The first and last nodes of a doubly linked list are immediately accessible and therefore allow traversal of the list from the beginning or end of the list
- Any node, once attained, can be used to begin a new traversal of the list, in either direction from the given node

NODE

- Every node contains three fields (pictured right):
  - A pointer to the previous node
  - A pointer to the next node
  - The data the node possesses

```
class Node<E> {
    private E element;
    private Node<E> next;
    private Node<E> previous;

    public Node(E e, Node<E> next, Node<E> previous, int index){
        element = e;
        this.next = next;
        this.previous = previous;
    }
```

- In a Cyclic Doubly Linked List, the first node points to the last node with its previous pointer and the last node points to the first node with its next pointer.

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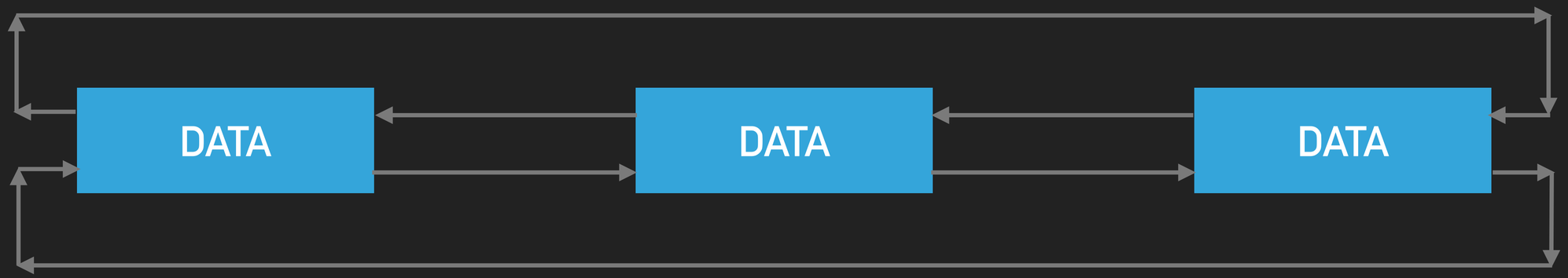

ADVANTAGES OF A CYCLIC DOUBLY LINKED LIST

- Can be traversed from head to tail or vice versa
- Like a normal linked list, the size is dynamic
- Nodes can be added or deleted to the beginning/end of the list in constant time O(1)
- The circular nature of the list allows for nodes to easily be visited more than once