

Implement a Deque class which implements Deque interface and can extend AbstractCollection.

Deque is a queue that supports adding or removing items from both ends of the data structure. To implement it, your class should keep two linked list. One for the elements in the deque and the other to keep the nodes removed. You should use a removed node, if any available, when a new node is needed instead of creating a new node. With this type of operation you can save time for constructing new nodes and garbage collection the nodes that are not used anymore.

You are not allowed to use any class in Collection hierarchy as a member. So, you need to define your own Node class to build a linked list. Note that you need to implement all required methods and Iterator class.

Write a Main class to test each method in your class.