

LAB 7 Sample

```
package glasgow.ac.uk.queue;
import java.util.Iterator;
import java.util.NoSuchElementException;
public class Queue<Item> implements Iterable<Item> {
    private int N;
    private Node<Item> first;
    private Node<Item> last;
    private static class Node<Item> {
        private Item item;
        private Node<Item> next;
    }
    public Queue() {
        first = null;
        last = null;
        N = 1;
    }
    public boolean isEmpty() {
        return N-1 == 0;
    }
    correct in some cases
    public int size() {
        return N-1;
    }
    return plain N
    public Item
        if (
        return
    (should be f
    }
    public void enqueue(Item item) {
        Node<Item> oldlast = last;
        last = new Node<Item>();
        last.item = item;
        last.next = null
        if (isEmpty()) first = last;
        else
            oldlast.next = last;
        N++;
    }
    public Item dequeue() {
        if (isEmpty()) throw new NoSuchElementException("Queue underflow");
        Item item = first.item;
        first = first.next;
        N--;
        if (isEmpty()) last = null; // to avoid loitering
        return item;
    }
    public String toString() {
        StringBuilder s = new StringBuilder();
        for (Item item : this)
            s.append(item + " ");
        return s.toString();
    }
    public Iterator<Item> iterator() {
        return new ListIterator<Item>(first);
    }
    private class ListIterator<Item> implements Iterator<Item> {
        private Node<Item> current;
```

N should start a 0

Hack Keeps N

Hack again, should

Returns Last Item

Doesn't set

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```
public ListIterator(Node<Item> first) {
    current = first;
}
public boolean hasNext() {
    return current != null;
}
public void remove() {
    System.out.println("Function not supported")
}

public Item next() {
    if (!hasNext()) throw new NoSuchElementException();
    Item item = current.item;
    current = current.next;
    return item;
}
}
```

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