

```

import java.util.*;
import java.nio. BufferOverflowException;

public class MemoryStream<E> implements OutputStream<E>,
        InputStream<E> {
    private final static int DEFAULT_CAPACITY = 1024;
    E[] contents;
    int back = 0;
    int front = 0;

    @SuppressWarnings("unchecked")
    public MemoryStream() {
        this.contents = (E[]) new Object[DEFAULT_CAPACITY];
    }

    @SuppressWarnings("unchecked")
    public MemoryStream(int capacity) {
        this.contents = (E[]) new Object[capacity];
    }

    public void write(E data) {
        if (this.back == this.contents.length) {
            throw new BufferOverflowException();
        }

        this.contents[this.back] = data;
        this.back++;
    }

    @SuppressWarnings("unchecked")
    public void close() {
        this.back = 0;
        this.front = 0;
        this.contents = (E[]) new Object[this.contents.length];
    }

    public E next() {
        if (this.back == this.front) {
            throw new NoSuchElementException();
        }

        E temp = this.contents[this.front];
        this.front++;
        return temp;
    }

    public boolean hasNext() {
        return this.back != this.front;
    }

    public String toString() {
        return Arrays.deepToString(this.contents);
    }
}

```