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I hereby pledge on my honor that I will strictly adhere to academic integrity codes and the work done on this examination is solely my own and I will not receive/give any help from/to anybody or source during this examination.

```
import java.util.ArrayList
class MyDeque<E> implements Deque<E>
{
  private int length;
  private ArrayList<E> arr; // I am using circular array
  private int cap;
  private int head;
  private int tail;
  private static final int INITIAL_CAP = 8;
  public MyDeque(){
    this.cap = INITIAL_CAP;
    this.length=0;
    this.head = 0;
    this.tail = 0;
    this.arr = new ArrayList<E>(this.cap);
  }
  public boolean offerFirst(E item){
    if(this.length == this.cap)
      this.reallocate();
    int index = (head-1) % this.cap;
    this.arr.set(index, item);
    this.head = index;
    this.length++;
    return true;
  }
```

```
public boolean offerLast(E item){
    if(this.length == this.cap) this.reallocate();
    int index = (this.tail+1) %this.cap;
    this.arr.set(index, item);
    this.tail = index;
    this.length++;
    return true;
}
public E pollFirst() throws Exception{
    if(this.length == 0) throw new Exception()
    E val = this.arr.get(this.head);
    this.head = (this.head+1) %this.cap;
    this.length--;
    return val;
}
public E pollLast() throws Exception{
    if(this.length == 0) throw new Exception()
    E val = this.arr.get(this.tail);
    this.tail = (this.tail-1) %this.cap;
    this.length--;
    return val;
}
private void reallocate(){
    ArrayList<E> temp = new ArrayList<E>(this.cap*2);
    int index = this.head;
    int tempCounter = 0;
```

```
while(index != this.tail)
{
    temp.set(tempCounter++, this.arr.get(index));
    index = (index+1) % this.cap;
}
this.head = 0;
this.tail = tempCounter-1;
this.cap *=2;
this.arr=temp;
}
```