In-Class Activity #10

Due Time 11:59 PM

The objective of this activity is to implement the `Queue` data structure using a provided `QueueADT` interface. You will complete the implementation of `ArrayBasedQueue` class, which uses a simple array as its underlying data structure to store numbers. The `ArrayBasedQueue` class must fully `implement` the methods defined in the `QueueADT` interface, ensuring they adhere to the expected behavior as specified in the interface documentation.

Specifications:

You are provided with the following files:

- `QueueADT.java`: A fully implemented interface defining the required abstract methods. Since `QueueBasedList` implements this interface, it **must not** be declared abstract and must provide full implementations of all required methods.
- `ArrayBasedQueue.java`: A skeleton code for the `ArrayBasedQueue` class with the full implementation of the `ArrayBasedQueue` constructor and the `isEmpty` & `isFull` methods. **You may add to this file as you see fit.**
- `QueueDriver.java`: A fully implemented class for testing purposes. **Do not modify this file.**

Requirements:

- Before you start coding, carefully read through the provided code to understand the `QueueADT` interface and the `QueueDriver` class.
- For the ArrayBasedQueue class, implement the `offer, poll` and `peek` methods according to the comments provided in the `QueueADT` interface.
- If your implementation is correct, running the provided test cases in the `QueueDriver` class will produce the following expected output:

```
Testing ArrayBasedQueue Implementation
Adding elements to the queue....
Attempting to add an element to a full queue.....
CANNOT PERFORM OFFER OPERATION-THE QUEUE IS ALREADY FULL
Polled: 1
Peeking front: 2
Polled: 2
Polled: 3
Polled: 4
Polled: 5
Attempting to poll from an empty queue......
CANNOT PERFORM POLL OPERATION-THE QUEUE IS EMPTY
Adding an element after emptying the queue....
Polled: 4
```

After thoroughly testing your code, Submit a screenshot of the output along with the `ArrayBasedQueue.java` file to the assigned DropBox on Brightspace by 11:59 PM