ArrayDeque

Task2: Interview Questions

1)what is ArrayDeque?

Definition:

Creates a dynamic array (resizable array) to store its elements from both sides of the queue.

It provides a resizable-array implementation of deque interface. Therefore, it is also known as array double-ended queue or simply array deck.

2) Show the Hierarchy of ArrayDeque in java?

Hierarchy of ArrayDeque

ArrayDeque class implements double-ended queue interface to support the addition of elements from both sides of queue. It also implements queue interface to support the first in first out data structure.

All implemented interfaces by ArrayDeque class in the hierarchy are Serializable, Cloneable, Iterable<E>, Collection<E>, Deque<E>, Queue<E>.

ArrayDeque class extends AbstractCollection. The hierarchy diagram of ArrayDeque is shown in the below figure.

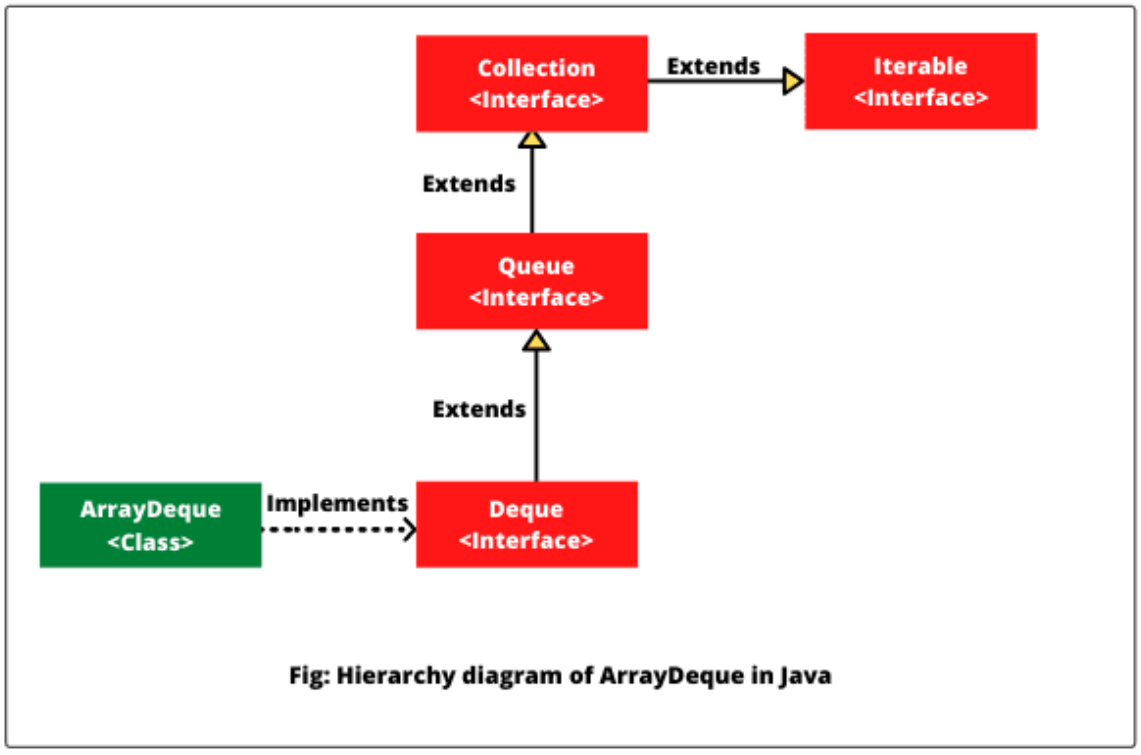

Fig: Hierarchy diagram of ArrayDeque in Java

3)What are the features of ArrayDeque?

Features of ArrayDeque:

1. Java ArrayDeque class provides a resizable array implementation of Deque interface.

2. It has no capacity restrictions. So, it can grow according to the need to handle elements added to the collection.

3. Array deque is not synchronized. That means it is not thread-safe. Multiple threads can access the same ArrayDeque object at the same time.
4. Null elements are restricted in the ArrayDeque.

4)List the Constructors of ArrayDeque class with example?

Constructors of ArrayDeque class :

ArrayDeque class defines the following constructors that are as follows:

1. ArrayDeque(): This constructor creates an empty array deque with starting capacity of 16 elements. The general syntax to create array deque object is as follows:

ArrayDeque<E> dq = new ArrayDeque<E>();

2. ArrayDeque(int numElements): This constructor creates an empty array deque with the specified initial capacity sufficient to hold elements. If the argument passed to numElements is less than or equal to zero, no exception will be thrown.

The general syntax to create ArrayDeque object with the specified initial capacity is as follows:

ArrayDeque<E> dq = new ArrayDeque<E>(int numElements);

For example:

ArrayDeque<String> dq = new ArrayDeque<String>(5);

3. ArrayDeque(Collection c): This constructor creates an array deque that is initialized with elements of collection c. If c contains null reference then NullPointerException will be thrown.

The general syntax to create ArrayDeque instance with the specified collection is given below:

ArrayDeque<E> dq = new ArrayDeque<E>(collection c);

5) List and show ArrayDeque elements with any one example?

ArrayDeque Example Programs

Let's take some useful example programs to perform the various operations based on the above methods.

1. Adding elements: Let's create a program where we will add elements to the ArrayDeque using methods such as add(), addFirst(), addLast(), offer(), offerFirst(), offerLast().

Example:

```
1. import java.util.*;
2. public class ArrayDequeExample {
3.   public static void main(String[] args) {
4.   //Creating Deque and adding elements
5.   Deque<String> deque = new ArrayDeque<String>();
6.   deque.add("Ravi");
7.   deque.add("Vijay");
8.   deque.add("Ajay");
9.   //Traversing elements
10.  for (String str : deque) {
11.  System.out.println(str);
12.  }
13.  }
14. }
```

Output:

```
Ravi
Vijay
Ajay
```

2. Accessing Elements: Let's create a program where we will access elements using methods like getFirst(), getLast(), etc.

3. Removing Elements: Let's make a program where we will remove an element from a deque using various methods available such as removeFirst(), removeLast(), poll(), pop(), pollFirst(), pollLast().

4. ArrayDeque as a Stack: Let's take an example program where we will use ArrayDeque to create a Stack. Look at the following source code to understand better.

5. Iterating over elements of Deque: ArrayDeque can be iterated over elements from both ends of deque using iterator() and descendingIterator() methods. Look at the following source code.