Queue interface in Java

=> Queue :-

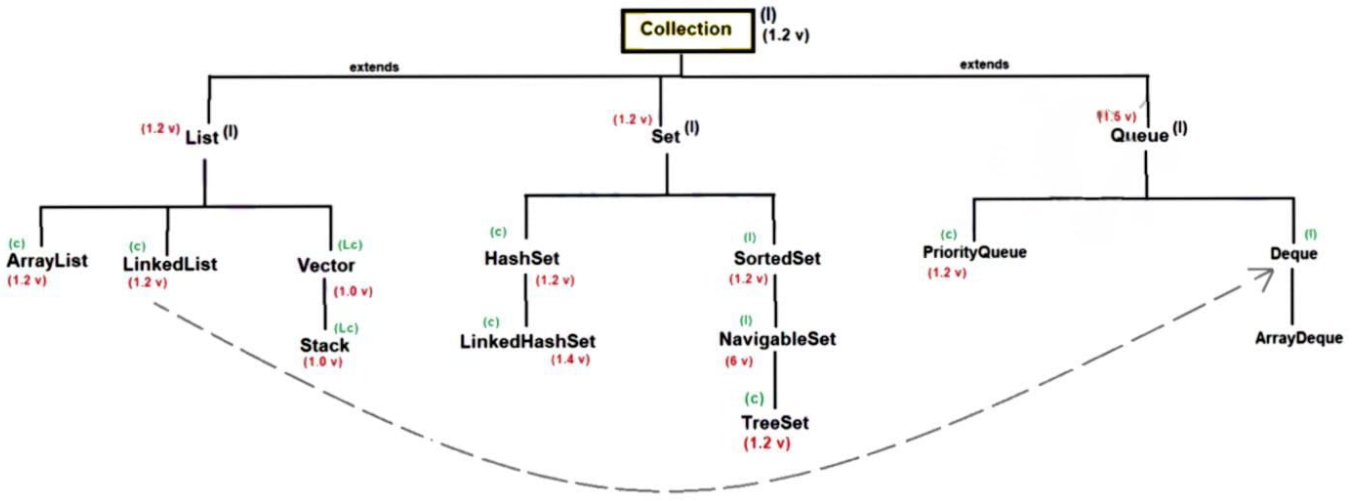
-Queue is the child interface of Collection interface

Syntax : public interface Queue extends Collection { - }

-Queue was introduced in JDK 1.5 version

-Queue orders the elements in FIFO(First In First Out) manner, but we can change this algorithm according to our requirements

➔ Hierarchy of Queue :-



Properties of Queue :-

1. Queue does not follow the insertion order
2. Queue follows the sorting order
3. Queue stores the same data type elements or homogeneous elements. If we try to store different elements then it will throw an exception saying "java.lang.ClassCastException"
4. Queue can store the duplicate elements
5. Queue does not store any null value. If we try to store null value then it will throw an exception i.e. "java.lang.NullPointerException"

Methods of Queue :-

1. boolean offer(Object obj) - to add the elements in the queue

2. Object peek() - It will return the head element of the queue. If no element is found in the queue it will return null value

3. Object element() - It will return the head element of the queue. If no element is found, it will throw an exception i.e. "java.util.NoSuchElementException"

4. Object poll() - It is used to remove the head element and also it will return that element, If no element is found, then it will return null value

5. Object remove() - It is used to remove the head element and also it will return that element. If no element is found, it will throw an exception i.e. "java.util.NoSuchElementException"

=> PriorityQueue :-

-PriorityQueue is an implementation class for Queue (but not direct implementation(through ExtractQueue interface))

-Syntax : public class PriorityQueue extends AbstractQueue implements Serializable { - }

-Underline Data Structure is balanaced Tree

-PriorityQueue was introduced in JDK 1.2 version

-Initial Capacity of pq is 11.

-PriorityQueue may not support on windows platform

Properties of PriorityQueue :-

1. PriorityQueue does not follows the insertion order

2. PriorityQueue does not follows the sorting order

3. PriorityQueue stores the same data type elements or homogeneous elements. If we try to store different data type elements then it will throw an exception i.e. "java.lang.ClassCastException"

4. PriorityQueue can stores the duplicate elements

5. PriorityQueue cannot store the null values

6. PriorityQueue is non-synchronized collection

7. PriorityQueue allows more than one thread at one time

8. PriorityQueue allows the parallel execution

9. PriorityQueue reduces the execution time which makes our application fast

10. PriorityQueue is not thread-safe

11. PriorityQueue does not provide guarantee for data consistency

Constructors :-

1. public PriorityQueue() - When we use default PriorityQueue constructor its initial capacity is 11
2. public PriorityQueue(int capacity)
3. public PriorityQueue(Comparator c)
4. public PriorityQueue(int capacity, Comparator c)
5. public PriorityQueue(SortedSet ss)
6. public PriorityQueue(PriorityQueue pq)
7. public PriorityQueue(Collection c)

Methods of PriorityQueue :-

= Contains the methods of Queue and Collection interface

When we should use PriorityQueue :-

= We can use PriorityQueue in SMS (JMS - Java Message Service), mail, offers, prime users etc

```
public class Test1 {
    public static void main(String[] args) {

        PriorityQueue pq=new PriorityQueue();

        pq.offer("aaa");
        pq.offer("bbb");
        pq.offer("ccc");
        pq.offer("ddd");
        pq.offer("eee");
        pq.offer("fff");

        System.out.println(pq);

        System.out.println(pq.peek());
        System.out.println(pq);

        System.out.println(pq.element());
        System.out.println(pq);

        System.out.println(pq.poll());
        System.out.println(pq);
```

=> Deque :

-It is also known as "double ended queue"

- LinkedList inherit Deque

-In Deque we can add or remove the elements on both side

-Deque is the child interface of Queue interface

-Syntax : public interface Deque extends Queue { - }

Methods of Deque :-

1. void addFirst(Object e);
2. void addLast(Object e);
3. boolean offerFirst(Object e);
4. boolean offerLast(Object e);
5. Object removeFirst();
6. Object removeLast();
7. Object pollFirst();
8. Object pollLast();
9. Object getFirst();
10. Object getLast();
11. Object peekFirst();
12. Object peekLast();

=> ArrayDeque :-

-ArrayDeque is an implemented class for Deque interface

Syntax : public class ArrayDeque extends AbstractCollection implements Deque, Cloneable, Serializable { - }

-ArrayDeque is used to provide the facility of Deque and Resizable-Array.

Properties of ArrayDeque :-

-In this also we can add and remove the elements from both side

-Null is not allowed in ArrayDeque

-ArrayDeque is not synchronized collection

-ArrayDeque has no capacity concept

Advantage :-