Short Answer:

1. Describe the Collections Type Hierarchy. What Are the Main Interfaces, and What Are the Differences Between Them?
2. What are the List interface implementations and what are the differences between them and when to use what?
3. What are the Queue interface implementations and what are the differences and when to use what?
4. What are the Set interface implementations and what are the differences and when to use what?
5. What are the Hashcode() and equal() functions?
6. How Is Hashmap Implemented in Java? How Does Its Implementation Use the Hashcode and Equals Methods of Objects? What Is the Time Complexity of Putting and Getting an Element from this Structure?
7. What are the Comparable and Comparator interfaces? What are the differences between them and how to use them?
8. What is Iterator? Why do we need iterator?

Coding Questions:

1. Write a Java program to search an element in an array list.

2. Reverse a LinkedList

```
Input: 1->2->3->4->5->NULL
Output: 5->4->3->2->1->NULL

// Definition for singly-linked list
public class ListNode {
  int val;
  ListNode next;
  ListNode() {}
  ListNode(int val) { this.val = val; }
  ListNode(int val, ListNode next) { this.val = val; this.next = next; }
}

public ListNode reverseList(ListNode head) {

}
```

3. Write a Java program to compare two sets and retain elements which are same on both sets.

4. Write a Java program to change default PriorityQueue to maximum PriorityQueue.

5. Given a string, sort it in decreasing order based on the frequency of characters.

```
Input: "tree"
Output: "eert"
```

6. Given a pattern and a string str, find if str follows the same pattern.

   Here "follows" means a full match, such that there is a bijection between a letter in the pattern and a non-empty word in the str.

```
Input: pattern = "abba", str="dog cat cat dog"
Output: true

Input:pattern = "abba", str = "dog cat cat fish"
Output: false
```

7. Given a string, find the first non-repeating character in it and return it's index. If it doesn't exist, return -1.

```
Input: "leetcode"
Output: 0

Input: "loveleetcode",
Output: 2
```

8. Given an array of integers, find out whether there are two distinct indices i and j in the array such that the absolute difference between nums[i] and nums[j] is at most t and the absolute difference between i and j is at most k.

```
Input: nums = [1,2,3,1], k = 3, t = 0
Output: true


Input: nums = [1,0,1,1], k = 1, t = 2
Output: true


Input: nums = [1,5,9,1,5,9], k = 2, t = 3
Output: false
```

9. Given an array of meeting time intervals consisting of start and end times [[s1,e1],[s2,e2],...] (si < ei), find the minimum number of conference rooms required.

```
Input: [[0, 30],[5, 10],[15, 20]]
Output: 2

Input: [[7,10],[2,4]]
Output: 1
```

10. Design and implement your own HashSet which should support linked list structure(can NOT use java Collection like LinkedList, you have to implement your own linkedlist) for each bucket. Please include add(), contains(), remove() method. You just need to support the Integer type.