Java Collections Notes

**Maps:**

* Hash Map is not synchronized but Hash Table is synchronized
* Hash Map is key is final and immutable
* Hash Map key object hashcode method plays a role in collision of object and performance
* In Hash Map, Rehashing is a process creating new arrays and applies new hash function to all the keys in the array. Size will be doubled of the existing array size once the load factor is reached
* Write operation on HashMap can trigger resizing of HashMap and if re-size is done by multiple thread at same time that could lead to race condition in HashMap.
* ConcurrentHashMap introduced in Java 1.5 and its different from HashMap because ConcurrentHashMap can’t have null key and its partially synchronized
* Difference between ConcurrentHashMap and synchronized.map is performance, 2nd one is like hashtable except null key allowed in synchronized map
* Hashing value decides for any Key to find correct segment and only that segment will be lockedin concurrentHashMap
* TreeMap is not synchronized and its ordered Map by keys
* TreeMap key should have implemented Comparable interface
* CopyOnWriteArrayList is counterpart of ArrayList in concurrent collection
* LinkedList implements Queue interface so its best suited for Queue DS with O(1) for best and worst case Analysis
* Iterator is advanced version of Enumeration, iterator can remove an element whereas Enum is only for read only purpose. Iterator will throw **ConcurrentModificationException**if any other thread is accessing the same object of iterator pointer object
* Difference between comparable and comparator interface.

<http://javarevisited.blogspot.in/2011/06/comparator-and-comparable-in-java.html>

* Fail-safe and Fail-fast are behavior types of iterators, fail-safe will not throw exception if collection is modified but other is different. Fail-safe will take copy if the collection and iterate it, fail-safe is not dependable all the time
* LinkedList and ArrayList differences are important,
  + Linklist implements Dequeue interface but ArrayList is not

<http://javarevisited.blogspot.in/2012/02/difference-between-linkedlist-vs.html>

* More collection Classes
  + PriorityQueue
  + DeQueue
  + Blocking Queue/Deque
  + NavigationalMap
  + CopyOnWriteArrayList

**String:**

* SubString has memory leak problem because new substring String object will refer the parent String Char Array reference
* String is immutable and its advantages are security, hashcode calculated only once, changes in string will not reflect any of the existing reference

**Questions**

1. **What is Collection ? What is a Collections Framework ? What are the benefits of Java Collections Framework ?**
2. **What is the root interface in collection hierarchy ?**
3. **What is the difference between Collection and Collections ?**
4. **Which collection classes are synchronized or thread-safe ?**
5. **Name the core Collection  interfaces ?**
6. **What is the difference between List and Set ?**
7. **What is the difference between Map and Set ?**
8. **What are the classes implementing List and Set interface ?**
9. **What is an iterator ?**
10. **What is the difference between Iterator and Enumeration ?**
11. **Which design pattern followed by Iterator ?**
12. **Which methods you need to override to use any object as key in HashMap ?**
13. **What is the difference between Queue and Stack ?**
14. **How to reverse the List in Collections ?**
15. **How to convert the array of strings into the list ?**
16. **What is the difference between ArrayList and Vector ?**
17. **What is the difference between HashMap and Hashtable ?**
18. **What is the difference between peek(),poll() and remove() method of the Queue interface ?**
19. **What is the difference between Iterator and ListIterator.**
20. **What is the difference between Array and ArrayList in Java ?**
21. **What is the difference between HashSet and TreeSet ?**
22. **Write java code showing insertion,deletion and retrieval of HashMap object ?**
23. **What is the difference between HashMap and ConcurrentHashMap ?**
24. **Arrange the following in the ascending order (performance):**  
    **HashMap , Hashtable , ConcurrentHashMap and Collections.SynchronizedMap**
25. **How HashMap works in Java ?**
26. **What is the difference between LinkedList and ArrayList in Java ?**
27. **What are Comparable and Comparator interfaces ? List the difference between them ?**
28. **Why Map interface does not extend the Collection interface in Java Collections Framework ?**
29. **When to use ArrayList and when to use LinkedList in application?**
30. **Write the code for iterating the list in different ways in java ?**
31. **How HashSet works internally in java ?**
32. **What is CopyOnWriteArrayList ?  How it is different from  ArrayList in Java?**
33. **How HashMap works in Java ?**
34. **How remove(key) method works in HashMap ?**
35. **What is BlockingQueue in Java Collections Framework?**
36. **How TreeMap works in Java ?**
37. **All the questions related to HashSet class can be found here** ,  [frequently asked HashSet interview questions](http://javahungry.blogspot.co.uk/2014/04/top-10-hashset-java-interview-questions-collection.html)
38. **What is the difference between Fail- fast iterator and Fail-safe iterator ?**
39. **How ConcurrentHashMap works internally in Java?**
40. **How do you use a custom object as key in Collection  classes like HashMap ?**
41. **What is hash-collision in Hashtable ? How it was handled in Java?**
42. **Explain the importance of hashCode() and equals() method ? Explain the contract also ?**
43. **What is EnumSet in Java ?**
44. **What are concurrentCollectionClasses?**
45. **How do you convert a given Collection to SynchronizedCollection ?**
46. **What is IdentityHashMap ?**
47. **What is  WeakHashMap ?**
48. **How will you make Collections readOnly ?**
49. **What is UnsupportedOperationException?**
50. **Suppose there is an Employee class. We add Employee class objects to the ArrayList. Mention the steps need to be taken , if I want to sort the objects in ArrayList using the employeeId attribute present  in Employee class.**

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### What is the difference between HashMap and Hashtable?

### What is the difference between Collection and Collections?

### What is the difference between Comparable and Comparator?

### What is the advantage of Properties file?

### What does the hashCode() method?

### Why we override equals() method?

### How to synchronize List, Set and Map elements?

### What is the advantage of generic collection?

### What is hash-collision in Hashtable and how it is handled in Java?

### What is the Dictionary class?

### What is the default size of load factor in hashing based collection?

1. **Diff between hash map and treemap?**
2. **diff bet hash table and hash map?**
3. **What copy technique internally used by HashSet clone() method ?**