1Ans : - Collection framework in java

Collection Framework is a combination of Classes and Interface, which is used to store and manipulate the data in the form of objects. It provides various classes such as Arraylist, Vector , Stack , and Hashset , etc. and interfaces such as List, Queue,Set,etc . for this purpose.

2Ans - What is the difference between the ArrayList and the Linked List?

**ArrayList**

1. Arraylist uses a dynamic array.
2. Arraylist is not efficient for manipulation because too much is required.
3. Arraylist is better to store and fetchdata.
4. Arraylist provides random access.
5. Arraylist takes less memory overhead as it stores only object.

**LinkedList**

1. Linkedlist uses a doubly linked list.
2. Linkedlist is efficient for manipulation.
3. Linkedlist is better to manipulatedata.
4. Linkedlist doesnot provides random access.
5. Linkedlist takes more memory overhead, as it stores the object as well as the address of that object.

3Ans – Difference between Iterator and ListIterator

**Iterator**

1 – The iterator traverses the elements in the forward direction only.

2 – The Iterator can be used in list , Queue , and Set.

3 – The iterator can only perform a remove operation while traversing the collection.

**ListIterator**

1 – ListIterator traverses the elements in backward and forward directions Both.

2- Listiterator can be used in list only.

3 – ListIterator can perform ?add, ?remove , ? set operations while traversing the collection

4Ans – Difference between Iterator and Enumeration

**Iterator**

1 – The iterator can traverse legacy and non – legacy elements.

2 – The iterator is fail – fast.

3 – The iterator is slower than enumeration

4 – The iterator can perform a remove operation while traversing the list.

**Enumeration**

1 – Enumeration can traverse only the legacy elements.

2 – Enumeration is not fail – fast.

3 – Enumeration is faster than iterator.

4 – The Enumeration can perform only traverse operation on the collection.

5Ans – What is the difference Between the list and Enumeration

The List and Set both extend the collection interface. However , there are some differnces between the two which are listed below

1 – The List can contain duplicate elements whereas the set includes the unique items.

2 – The list is the ordered collection which maintains the insertion order whereas Set is an unordered Collection which doesnot preserve the insertion order.

3 – The List Interface contains a Single legacy class which is a vector class whereas the set interface doesnot have a legacy class.

4 – The list interface can allow a number of null values whereas the set interface only allow a single null value.

6Ans – Difference Between the HashSet and the Tree Set

Both Hashset and TreeSet are implementations of the Set Interface in Java, But they have some differences in terms of their properties and usage.

**Ordering :** Hashset is a unordered collection objects where as TreeSet is a Sorted Set of elements based on their natural order or a custom comparator.

**Duplication :** Hashset doesnot allow duplicates elements , While Treeset doesnot allow duplicates as well.

**Implementation** : Hashset is implemented using a Hashtable , while TreeSet is Implemented using a Self balancing Binary Search Tree(Red Black Tree)

**Performance :** Hashset has constant Time Complexity O(1) for adding , removing , and testing the existence of the element. While Treeset has a logarithmic time complexity O(logn) for these operations for these operations due to its self balancing property.

**Memory Usage** **:** Hashset uses less memory than treeset because it stores just the elements while as tree set also stores some extra information for maintaining the order.

**Iteration :** HashSet provides no guarantee regarding the order of iteration, While Tree set gguarantees the order of iteration (Elements are arranged in sorted order)

**Usage** : HashSet is suitable when ordering is not important, and fast access and membership tests are needed. Tree Set is Suitable when Elements are stored and need to accessed in a specific order.assHHHassHHH

7Ans : Both Arrays and Arraylists are used to store the collection of elements in java, But they have some differences in terms of their properties and usage.

**Type :** Arrays can store elements of primitive data – types as well as objects, while array list can only store objects.

**Size** : The Size of an Array is fixed once it is created, while the size of an arraylist can be dynamically increased or decreased by adding or removing elements.

**Mutability** : Arrays are mutable, meaning that you can modify the elements in an array after it has been created

. Arraylist are also mutable , but the only way to modify it is by adding , removing or modifying elements

**Performance** : Arrays has better performance than arraylist for certain operations, such as accessing elements by index , because they are implemented as continuous block of memory. Arraylist , on the otherhand , uses dynamic memoryallocation and are implemented as a dynamic array. Which may result in more memory overhead and slower performances fro certain operations.

**Methods** : Arrays has limited set of methods compared to the arraylists , which provides more methods for manipulating the collection, such as adding, removing and sorting the elements

**Initialisation** : Arrays can be initalised with values at the time of creation , while arraylist requires the use of methods to add elements to the collection.

**Compatibility** : Arrays are compatible with traditional for loops and can be easily passed to other method , while ArrayList requires the use of a special for-each loop and may require more code to be passed to other methods