1. What is the collection framework in Java?

Ans:- set of interfaces and classes that stores the data and add, delete, retrieve and manipulate the Data in the form of Objects. It provides various classes such as ArrayList, Vector, Stack. HashSet and Interfaces such as List, Que, Set etc.

1. What is the difference between ArrayList and LinkedList ?

Ans:-

| ArrayList uses Dynamic Array | LinkedlList uses a doubly linked list |
| --- | --- |
| ArrayList is not efficient for manipulation because too much is required | LinkedList is efficient for manipulation |
| ArrayList is better to store and fetch data | LinkedList is better to manipulate data. |
| ArrayList provides random access | LinkedList doesn’t provide random access. |
| ArrayList is efficient in Searching Operation i.e Time complexity is O(1) | LinkedList is efficient in Insertion operation i.e Time complexity is O(1) |
| Index base insertion is possible but it shift all data | Index base insertion more preferable bcoz its not shift all data |

1. What is the difference between Iterator and ListIterator?

Ans:-

| Iterator | ListIterator |
| --- | --- |
| The iterator traverses the elements in the forward direction only | ListIterator traverse the elements in backward direction and forward directions both. |
| The Iterator can be used in List, Set, and Queue. | ListIterator can be used in List only |
| The iterator can only perform a remove operation while traversing the collection | ListIterator can perform, add , remove and set operation while traversing the collection |

1. What is the difference between Iterator and Enumeration?

Ans:-

| Iterator | Enumeration |
| --- | --- |
| The iterator can traverse legacy and non legacy elements | Enumeration can traverse only legacy elements. |
| The iterator is slower than Enumeration | Enumeration is faster than Iterator |
| The Iterator can perform a remove operation while traversing the collection | The Enumeration can perform only traverse operations on the collection. |

1. What is the difference between List and Set?

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

1. The List can contain duplicate elements whereas Set includes unique items.
2. The List is an ordered collection which maintains the insertion order whereas Set is an unordered collection which does not preserve the insertion order.
3. The List interface contains a single legacy class which is Vector class whereas the Set interface does not have any legacy class.
4. The List interface can allow a number of null values whereas Set Interface only allows a single null value.

6) What is the difference between HashSet and TreeSet?

Ans:-

| HashSet | TreeSet |
| --- | --- |
| HashSet is an unordered collection of elements | TreeSet is a sorted set of elements. |
| HashSet is implemented using Hast table | TreeSet implemented using Binary search tree. |
| HashSet has constant time complexity o(1) for adding, removing and testing the element | TreeSet has a time complexity of O(n) for these operations due to balancing property. |
| HashSet uses less memory than TreeSet because it store the elements | While TreeSet stores additional information for maintaining order |
| HashSet does not provide output in sorted order it preserved order of insertion | TreeSet provide guarantees of giving output in sorted order. |
| HashSet is suitable when ordering is not important and fast access and membership tests are needed. | TreeSet is suitable when elements need to be sorted or accesses in a specific order. |

7) What is the difference between Array and ArrayList ?

Ans:-

| Array | ArrayList |
| --- | --- |
| Array is use to store elements of primitive data types | ArrayList is use to store only objects. |
| The size of an Array is fixed once its is created. | ArrayList can be dynamically increased or decreased by adding or removing elements. |
| Arrays are mutable, meaning that you can modify the elements in an array after it has been created | ArrayList is also mutable, but the only way to modify it is by adding, removing or modifying elements. |
| Arrays have 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, use dynamic memory allocation and are implemented as a dynamic array, which may result in more memory overhead and slow performance for certain operations. |
| Arrays have a limited set of methods compared to ArrayList | ArrayList provides more methods for manipulating the collection, such as adding, removing and sorting elements. |
| Arrays can be initialized with values at the time of creation | ArrayList requires the use of methods for manipulating to add elements to a collection. |
|  |  |

8) What is a Map in Java?

Ans:- A Map is collection in Java that stores data as key-value pairs, where each key is unique.

9) What are the commonly used implementations of Map in Java?

Ans:-The commonly used implementation of Map in Java are HashMap, TreeMap, LinkedHashMap, and concurrentHashMap.

10) What is the difference between HashMap and TreeMap?

Ans:- HashMap is an unordered collection that uses hashing to store the key- value pairs, while TreeMap is a sorted collection that stores the key value pairs in a sorted order based on the natural order of the keys or custom Comparator.

11) How do you check if a key exists in a Map in Java?

Ans:- we can check if a key exists in a Map in Java using the containsKey() method or get() method. The containsKey() method returns a boolean value indicating whether the Map contains the specified key, While the get() method returns the value associated with the speci