Collection Framework

Assessment Questions-

Question -1 What is the collection framework in Java ?

Ans-

The Java Collection Framework is a set of c;asses and interfaces in Java that provide an organized way to store and manipulate groups of objects. It includes various types of data structures such as lists, sets, maps, queues, and more, each designed to serve a specific purpose.The framework provides a consistent and efficient way to manage collections of objects, making it easier for developers to write efficient and scalable code. It is an essential part of the Java programming language and is widely used in various applications and software development projects.

Question -2 What is the difference between ArrayList and LinkedList?

Ans-

In Java , ArrayList and Linked is that ArrayList is implemented as a resizable array, while LinkedList is implemented as a doubly-linked list. ArrayList provides faster random access to elements, while LinkList provides faster insertion and deletion operations. Additionally, ArrayList requires more memory than LinkedList due to its fixed size.

Question -3 What is the difference between iterator and Listiterator?

Ans-

In short, the main difference between Iterator and Listlterator is that Listlterator is a more powerful iterator that is specific to lists, while Iterator is a general-purpose iterator that can be used with any collection. Listlterator can traverse the list in both forward and backward direction, provides additional methods to add, set or remove elements at any position in the list, and allows access to the precious element, while operator can only traverse the collection in forward direction and remove elements.

Question -4 What is the difference between iterator and Enumeration?

Ans-

In short, an iterator is a programming construct that allows you to traverse a collection of data one item at a time, while an enumeration are a data type that provides a way to assign unique names or values to a set of items in a collection. Iterators focus on the order and access of items , while enumerations focus on the identification of items within a collection.

Question -5 What is the difference between List and Set?

Ans-

In Java, a list is an ordered collection of elements that can contain duplicates, while a set is an unordered collection of unique elements that does not allow duplicates. list s are accessed by index, while sets are accessed using the element itself. Lists are implemented by classes like ArratList and LinkedList, while sets are implemented by classes like HashSet and TreeSet.

Question 6- What is the difference between HashSet and TreeSet?

Ans-

HashSet and TreeSet are two implementations of the Set interface that provide different trade-offs between performance and ordering requirements;

. HashSet: HashSet is implemented using a hash table data structure, which provides constant-time performance for add, remove, and contains operations. However, HashSet does not maintain any order among the elements and the order of iteration may change over time. HashSet is suitable when you don’t care about the order of the elements and want fast access to elements.

. TreeSet: TreeSet is implemented using a red-black tree data structure, which provides logarithmic-time performance for add, remove, and contains operations. However, TreeSet maintains the elements in sorted order based on their natural ordering or using a customer Comparator. TreeSet is suitable when you need the elements to be sorted and don’t mind slower access times.

In summary, if you need fast access times and don’t care about ordering, use HashSet. I you need ordering, use TreeSet, but be aware of the slower performance

Question 7 What is the difference between Array and ArrayList?

Ans-

An Array is a fixed-size data structure that stores a collection of the same type . once an array is created, its size cannot be changed. On the other hand, an ArrayList is a dynamic data structure that allows the addition and removal of elements at runtime. An ArrayList can store elements of different types and its size can be changed dynamically.

Here are some key differences between Array and ArrayList in Java:

1. Size: Arrays have a fixed size that cannot be changed after creation, while ArrayList can grow or shrink in size dynamically.
2. Type: An array can only store elements of a specific type, whereas an ArrayList can store elements of any type.
3. Performance: Array generally offers better performance for random access and traversal, while ArrrayList may offer better performance for insertion and removal operations.
4. Syntax:Arrays are declared using square brackets and must be initialized with a specific size, While ArrayList is declared using the ArrayList class and can be initialized without a specific size.
5. Usage:Arrays are often used for fixed-size collections, while ArrayList is often used for dynamic collections that need to grow or shrink in size.