Java Collection- Basic

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Collection Basic

- ★ What is Collection?
- ★ Hierarchy of Collection Framework
- ★ Difference Between List and Set
- ★ Stack and Queue
- ★ ArrayList Class
- ★ Example of ArrayList and different way of Iteration

★ What is Collection?

★ What is Collection in Java?

A Collection represents a single unit of objects, i.e., a group.

★ What is Framework?

It provides readymade architecture.
It represents a set of classes and interfaces.
It is optional.

★ What is Collection framework ?

The Collection framework represents a unified architecture for storing and manipulating a group of objects.
It has:
1] Interfaces and its implementations, i.e., classes
2] Algorithm

★ What is the use of Collection Framework?

To overcome limitations of Array we use Collection Framework.

★ Disadvantages of Array?

1] Fixed in Size-Can't Increase & decrease once declared.
2] Homogeneous Data Structures-Only one type of data can store.
3] No underlying Data Structure-means no readymade methods to sort etc.

★ Hierarchy of Collection Framework

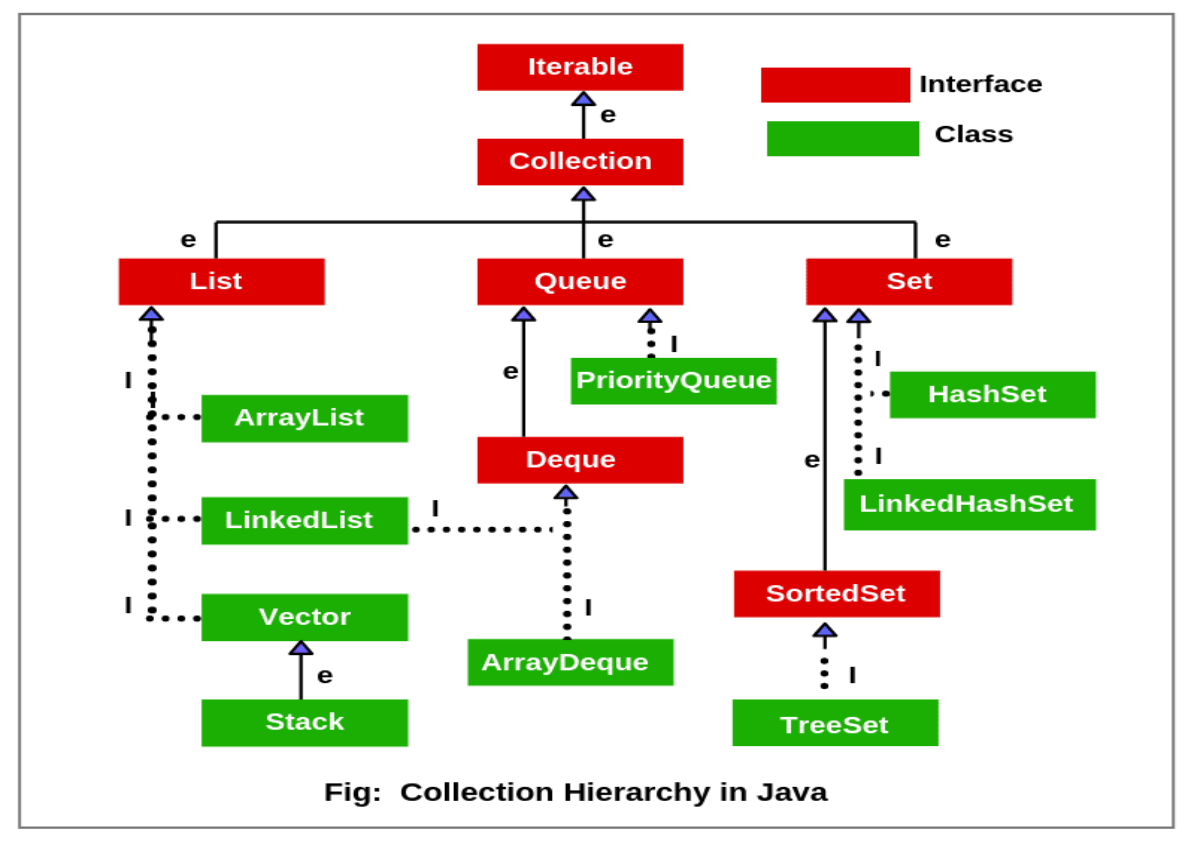


Fig: Collection Hierarchy in Java

★ Difference Between List and Set

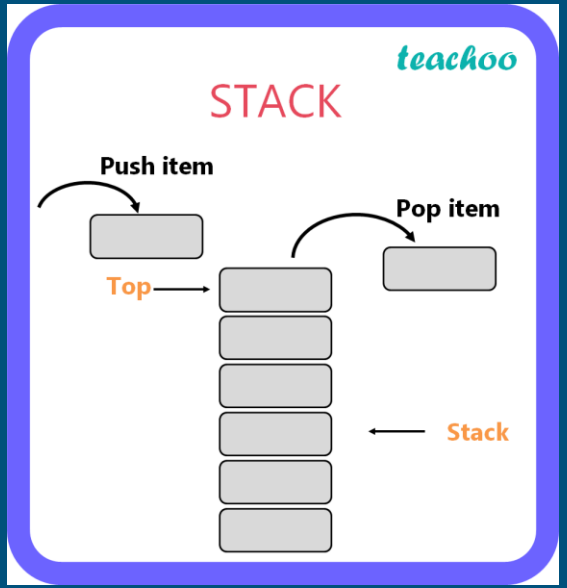
Difference between List and Set:

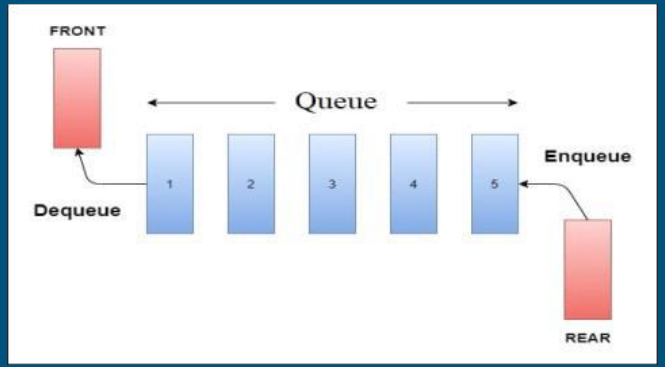
List	Set
1. The List is an indexed sequence.	1. The Set is an non-indexed sequence.
2. List allows duplicate elements	2. Set doesn't allow duplicate elements.
3. Elements by their position can be accessed.	3. Position access to elements is not allowed.
4. Multiple null elements can be stored.	4. Null element can store only once.
5. List implementations are ArrayList, LinkedList, Vector, Stack	5. Set implementations are HashSet, LinkedHashSet.

★ Stack and Queue

★ Stack - LIFO -Last IN First Out.

★ Queue : FIFO -First IN First Out.





★ ArrayList Class

- ★ ArrayList is same like array which can grows dynamically in memory.
- ★ It uses dynamic array for storing the elements.
- ★ It extends AbstractList Class and implements List Interface.
- ★ It is not synchronized.
- ★ Initial Capacity of ArrayList is 10 and it increases it's capacity by 50%.
- ★ ArrayList loadFactor = 50%
- ★ ArrayList Methods : add() and get() etc.

★ Example of ArrayList and different way of Iteration

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★ Example of ArrayList and different way of Iteration

- Iterator (Explain by Drawing)

  It is used to travers in List and Set both.
  It travers list and set in forward direction.
  It remove element from List and Set objects.
  Methods are :-hasNext(), next() and remove().

★ List Iterator

  It is used only with List type Classes it traverse list bidirectional.
  It can remove, replace, add elements in List.
  Methods are :-
  hasNext(); previous(); Next() -add(E e) Remove() -set(E e)
  hasPrevious() -index()

★ Example of ArrayList and different way of Iteration

★ Enumeration

It is used with legacy classes by using this we can traverse only with forward direction.

Enumeration access readonly interface.It can't remove elements.

Methods are :- hasMoreElements(); nextElement();

```
Vector<Integer> ve = new Vector<Integer>();
        ve.add(10);
Enumeration<Integer> enm = ve.elements();
while(enm.hasMoreElements()) {
        System.out.println(enm.nextElement());
}
```

★ Example of ArrayList and different way of Iteration

★ 4] For each loop :-

The foreach loop introduced in JDK 1.5.

It is mainly used to traverse.

Syntax :

```
For(dataType variable : CollectionObject){
}
```

Que :-

1] How to sort element of list classes and remove duplicates? (Hint -TreeSet)

2] How to sort element of list classes & keep duplicates? (Hint -Collections.sort())

3] How to remove duplicate element of list class and maintain insertion order?(Hint -LinkedHashSet)

Thank you