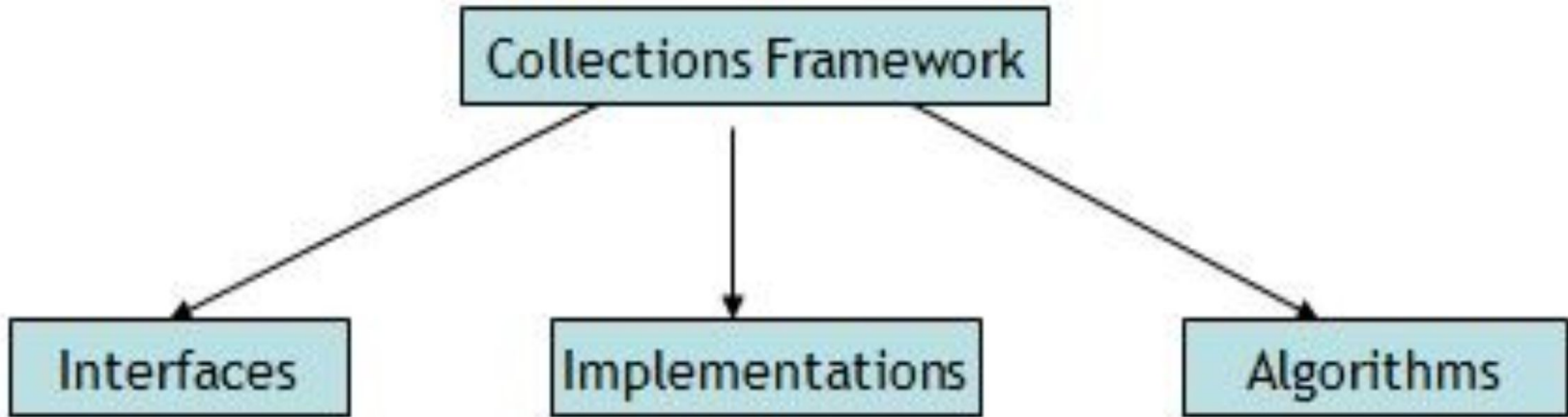# Collections

Collections ?

Collections are java (interfaces, classes, methods) provided data structures.

It is an extensive set of interfaces, abstract classes and concrete classes together with support tools Framework is provided in java.util package and comprises three parts:

1. Core interfaces
2. Set of implementations.
3. Utility methods

Collections are primarily defined through a set of interfaces

- Supported by a set of classes that implement the interfaces.
- It does not hold primitive data types (uses wrapper classes).
- Collections can be type safe, i.e. type of elements can be specified using Generics.

Example:

Collection<String> stringCollection = new LinkedList<String>();

stringCollection.add("GoodMorning'); // Right
stringCollection.add(8); // Wrong

Collection<Integer> integerCollection = new LinkedList<Integer>();
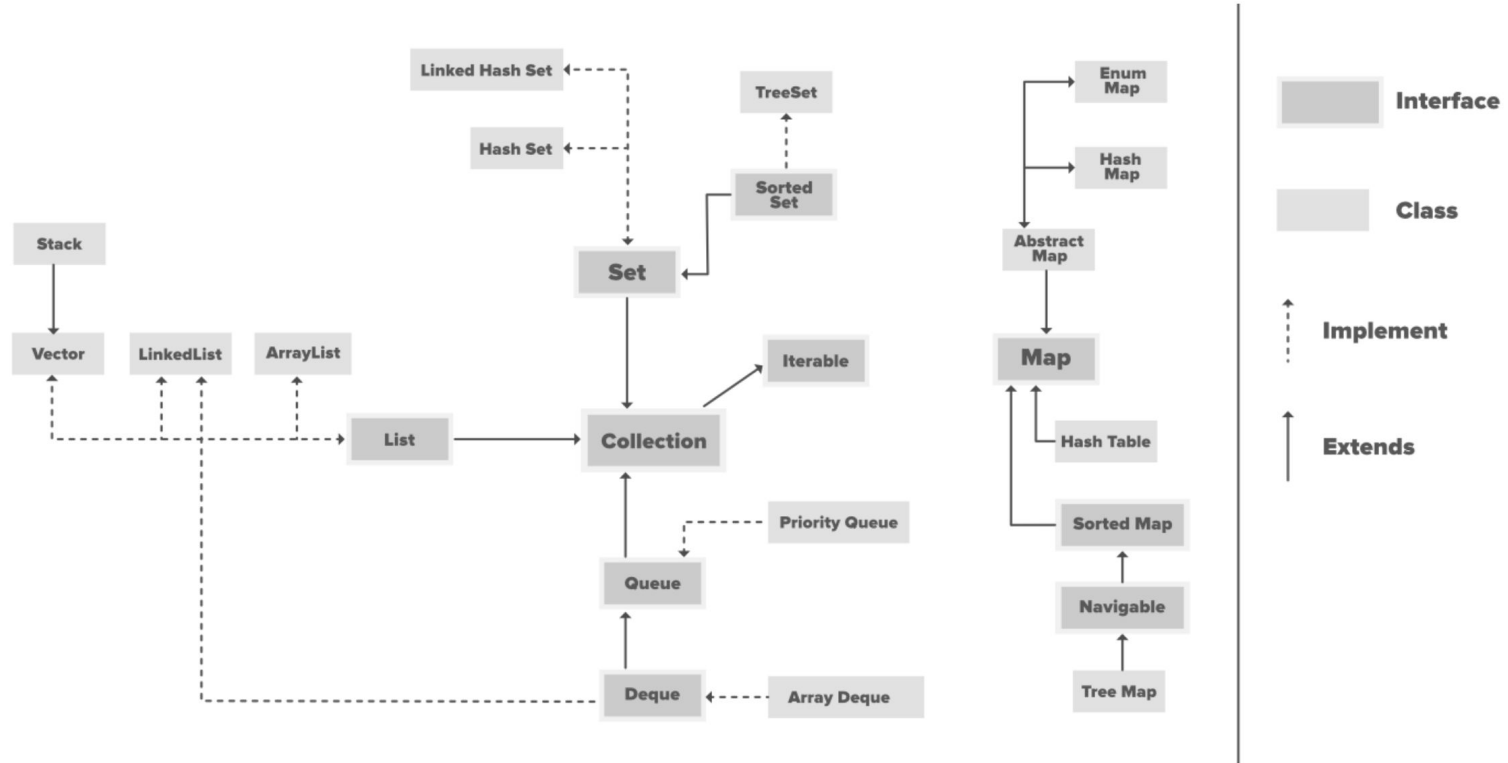integerCollection.add(10);
integerCollection.add(new Integer(12));
integerCollection.add("hello"); //Wrong

Hierarchy

The utility package, (java.util) contains all the classes and interfaces that are required by the collection framework.

Simple Example

1. Create arraylist of car objects and assign it to collection reference
2. Print the values of arraylist
   a. Use both iterabale and collections object directly

Collections can be grouped into four types

- List – Lists of things
- Sets – Unique things
- Maps – Things with a unique ID
- Queues – Things arranged by the order in which they are to be processed

Above can be further classified into

- Sorted ---5,2,7 ---> 2,5,7
- Ordered → 3,5,10,11 ---> 3,5,10,11
- Unordered → 4,7,9,30 → 8,7,30,4 ---> 7,8,4,3

Maps

- Maps are similar to collections but are actually represented by an entirely different class hierarchy

- Map is an object that maps keys to values

- Also called as Associative array or a dictionary

- Depends on equals() method to determine whether two keys are same or different . Keys cannot be duplicated.

- Methods to retrieve key, values and key–value pair
  - keySet() : returns a Set
  - values(): returns a Collection
  - entrySet(): returns a Set

Simple Example

1. Create HashMap of car objects and assign it to Map reference
2. Print the all values of HashMap
3. Print a particular value based on key from HashMap

BO

From Book example used in Class and Objects

1. Create a list with Book objects and print them
2. Add Books to a HashMap with ISBN as key
3. Get ISBN from user and print Book details

Practice collections after training hrs