**JFSD: A-Z of Back-end and Database Development**

**Day 6 : 20 Jul. 24**

Collection Framework – Data Structure

Variable

int a=10;

a=20;

array : it is use to store more than one value of same types.

int abc[];

structure : it is use to store more than one value of different types.

class :

class Employee {

int id;

String name

float salary;

}

Employee emp = new Employee();

emp.id=100;

emp.name=”Ravi”;

emp.salary=12000;

emp.id=200;

array objects

syntax

int abc[]=new int[100];

Employee employees[]=new Employee[100];

employees[0]=new Employee();

employees[1]=new Employee();

employees[2]=new Employee();

whenever we display reference of user defined class using prinltln method. by default it will call toString() method of object class. by default every class extends object. that toString() method return string message as [packageName.className@code](mailto:packageName.className@code).

Limitation of array object.

We can store same type of object.

Array doesn’t provide any pre defined method to store, delete, update and retrieve, search, sort etc.

Collection Framework : it contains set of collection of classes and interface which help to store any type of values or objects like int, float, char, double, string as well as user defined objects. It provided lot of pre defined methods which help to store, delete, update, search, sort very easily.

Collection Framework hierarchy

Collection -🡪 interface part of util package.

doesn’t extends to Collection

Set List Queue Map 🡪 interfaces

Set it a type of interface. It allow to store more than one value of same as well as different type. Set doesn’t allow duplicate. In Set few classes maintain the order or unorder or sorted. Set doesn’t provide index concept.

Set classes

1. HashSet : unorder
2. LinkedHashSet : this class internally extends HashSet class. it doesn’t provide any extra method. only it maintain the order.
3. TreeSet : it is a type of set class. which internally implements SortedSet interface and that interface extends Set interface. SortedSet interface provide algorithm to display data in sorting order by default ascending. So in TreeSet we need to store homogeneous elements. This class provided few extra method like headset, tailset, subset etc.

Above classes directly or indirectly implements Set interface.

List : it is a interface. It allow duplicate records. It maintain order using index position. It allow to store same as well as different type of values by nature.

List classes

1. ArrayList : it is a type of list class by default it allow to store same type as well as different type of values. ArrayList also known as dynamic memory allocation. It provided lot of pre defined method which help to add in between, remove from in between, search, sort very easily.
2. LinkedList : LinkedList internally use node concept to store the value. Base upon type of LinkedList ie Single Linked or double linked node are connect to each others. But in Java by default LinkedList consider as double linked list.

If we want to do more insertion and deletion linked list is good option. If we want to do more retrieve operation array list.

1. Vector: Vector is known as legacy class. by default all methods class are synchronized. So Vector is thread safe.
2. Stack : Stack is First In Last Out features. In Java Stack internally extends Vector class.

Queue : It is a type of data structure. Queue provide features as First In First Out etc.

Queue classes

1. PriorityQueue : first in first out base upon priority by default lower value. The element are unorder. The first element always lower value element ready to poll out.
2. LinkedList also type of queue. : first in first out . it maintains the order.

Map : We can store the information in the form of key-value pairs. Key is unique and value may be duplicate.

Map classes

1. HashMap : it doesn’t maintain the order. It allow null key and null value.
2. LinkedHashMap: LinkedHashMap maintain the order. It allow null key and null value.
3. TreeMap : TreeMap internally implemented SortedMap interface. That interface provide soring algorithm for key. So in TreeMap we need to use Homogeneous elements. TreeMap doesn’t allow null as key.
4. Hashtable : legacy class. by default methods are synchronized. So thread safe.

Collection Framework with Generics.

CollectClass/Interface<Type> objectName = new ClassName<Type>();

Type can be Integer, Float, Double, Character, String or user defined class.

Retrieve the value from collection of classes.

1. For each loop or enhance loop : Set
2. Iterator interface : Set , ArrayList and LinkedList
3. ListIterator interface : ArrayList and LinkedList , Vector
4. Enumeration interface : Vector