**Day 6:**

**Collection Framework (Data structure):**

Collection framework provided set of collection of classes and interfaces which help to store collection of data or item or object of any types. Which provided of pre defined methods which help to add, retrieve, update, sort, search very easily.

Primitive data tyeps

int a;

a=10

a=20;

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

int num[]={10,20,30,40,50};

structure

class : class is type of structure.

class Employee {

int id;

String name;

float salary;

}

**Employee emp = new Employee();**

emp.id=100;

emp.name=”Ravi”;

emp.salary=12000;

array object

syntax

int **num[]=**new int[100];

**Employees employees[]=**new Employees**[size];**

Employee employees[]=new Employee[100];

Zero object of type employee. It created one object of type array.

**employees[0]=new Employee();**

**employees[99]=new Employee();**

**array of product**

**Service layer :** this class contains pure business method.

Service layer is not responsible to interact with input device.

Array it can be primitive or object array.

Limitation

1. Memory size (because array is know as fixed in memory size)
2. Array doesn’t provide any pre defined methods to add, delete, update and retrieve etc.

Collection framework hierarchy

Collection --🡪 interface

Doesn’t extends

Set List Queue Map -🡪 interface

Set : it allow to store unique data or item (doesn’t allow duplicate). Set can be order, unorder or sorted. Set doesn’t provide index concept.

**Set classes**

HashSet : extends Set interface. It doesn’t maintain the order.

LinkedHash : This class extends HashSet. Maintain the order.

TreeSet : TreeSet internally implements SortedSet interface and that interface extends Set interface. SortedSet interface provide a logic to do sorting by default ascending order. In TreeSet we need to store same type values.

List : list allow to store more than one element using index concept. List maintain the order.

**List classes**

ArrayList : by default ArrayList allow to store any types of value. Generally normal array allow to store same types values. Normal array doesn’t support dynamic memory allocation. But ArrayList provide. In normal array doesn’t provide any method to add or remove or search element. But ArrayList provide lot of pre defined method which help to add, remove, search, iterate element very easily.

LinkedList : LinkedList is a type of data structure which use node concept to store the data.

Node mainly divided into 2 or 3 parts depending upon type of LinkedList

1. NextNode -🡪 Reference of node
2. PreNode -🡪Reference node
3. Data -🡪 it can be number, string, Booelan, object

Types of linked list

1. Single linked list
2. Double linked list
3. Circular single linked list
4. Circular double linked list

int num[]=new int[10];

[][][][][][]

num[0]=100;

Employees employees[]=new Employee[100];

[reference of heap of employee type][null][][][][][][]

employees[0]=new Employee();

Data nextRef data nextRef data nextRef ---🡪 null

10 20 30

Pref data nref pref data nref pref data next

LinkedList is by default double linked list consider.

**Vector** : Vector is known as legacy class. by default all methods in Vector class are synchronized. Vector is known as Thread safe class.

**Stack :** Stack is data structure class. which support features is LIFO (List In First Out).

Push : add the element

Pop : remove top most element

Peek: check top element

Size() : number of present in stack

isEmpty(); stack is empty or not.

Queue : Queue provide a features as FIFO(First In First Out) etc.

**Queue classes**

PriorityQueue

LinkedList

**Map** : it allow to store key-value pairs. Key is unique and value can be duplicate.

Map classes

HashMap

LinkedHash

TreeMap

Hashtable