# EXPERIMENT NO.13

## 1. What is Generic Programming?

Ans :

Generic programming refers to writing code that will work for many types of data.Code that uses generics has many benefits over non-generic code: Stronger type checks at compile time. A Java compiler applies strong type checking to generic code and issues errors if the code violates type safety. Fixing compile-time errors is easier than fixing runtime errors, which can be difficult to find.

A generic class in Java is a class that can operate on a specific type specified by the programmer at compile time. To accomplish that, the class definition uses type parameters that act as variables that represent types (such as int or String).

**Syntax to use generic collection** :

Class Or Interface<Type>

**Example to use Generics in java**

ArrayList<String>

**Advantage of Java Generics**

There are mainly 3 advantages of generics. They are as follows:

1) Type-safety : We can hold only a single type of objects in generics. It doesn't allow to store other objects.

2) Type casting is not required: There is no need to typecast the object.

Before Generics, we need to type cast.

```
List list = new ArrayList();

list.add("hello");

String s = (String) list.get(0);//typecasting before generic programming
```

After Generics, we don't need to typecast the object.

```
List<String> list = new ArrayList<String>();

list.add("hello");

String s = list.get(0);
```

3) Compile-Time Checking: It is checked at compile time so problem will not occur at runtime. The good programming strategy says it is far better to handle the problem at compile time than runtime.

## 2.What is Framework?

Ans :

In general, a framework is a real or conceptual structure intended to serve as a support or guide for the building of something that expands the structure into something useful.

In computer systems, a framework is often a layered structure indicating what kind of programs can or should be built and how they would interrelate. Some computer system frameworks also include actual programs, specify programming interfaces, or offer programming tools for using the frameworks. A framework may be for a set of functions within a system and how they interrelate;

Examples of frameworks that are currently used or offered by standards bodies or companies include:

Resource Description Framework:- A set of rules from the World Wide Web Consortium for how to describe any Internet resource such as a Web site and its content.

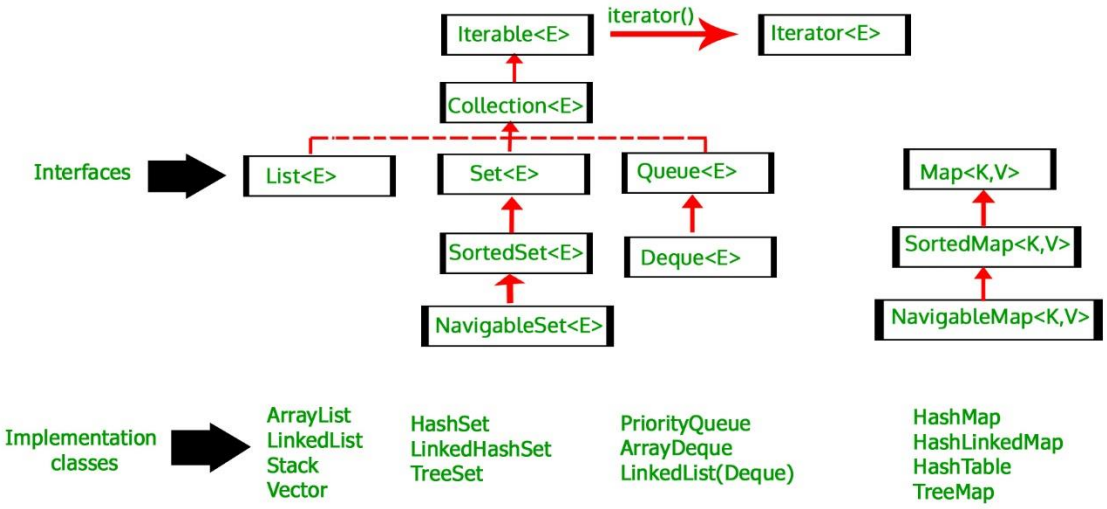
Internet Business Framework:- A group of programs that form the technological basis for the mySAP product from SAP, the German company that markets an enterprise resource management line of products

Sender Policy Framework: a defined approach and programming for making e-mail more secure

## 3.What is Collection Framework in JAVA?

Ans :

Java provides Collection Framework which defines several classes and interfaces to represent a group of objects as a single unit.




**Advantages of Collection Framework:**

1. Consistent API : The API has a basic set of interfaces like Collection, Set, List, or Map. All classes (ArrayList, LinkedList, Vector, etc) that implement these interfaces have some common set of methods.

2.Reduces programming effort: A programmer doesn't have to worry about the design of Collection, and he can focus on its best use in his program.

3.Increases program speed and quality: Increases performance by providing high-performance implementations of useful data structures and algorithms.

collection framework represent as unified architecture for storing & manipulating groups of objects .It has

1)Interface and its implementations.

2)algorithms

## 4.Comment on Performance of Arraylist as compare to Array?

Ans :

1. Resizable : Array is static in size that is fixed length data structure, One can not change the length after creating the Array object.

ArrayList is dynamic in size . Each ArrayList object has instance variable capacity which indicates the size of the ArrayList. As elements are added to an ArrayList its capacity grows automatically.

2. Performance : Performance of Array and ArrayList depends on the operation you are performing :

resize() opertation :- Automatic resize of ArrayList will slow down the performance as it will use temporary array to copy elements from the old array to new array.

add() or get() operation :- adding an element or retrieving an element from the array or arraylist object has almost same performance , as for ArrayList object these operations run in constant time.

| | Array | ArrayList |
|---|---|---|
| Resizable | No | Yes |
| Primitives | Yes | No |
| Iterating values | for,for each | Iterator,for each |
| Length | Length variable | Size method |
| Performance | Fast | Slow |
| Multidimensional | Yes | No |
| Add Elements | Assignment operator | add method |

Array is faster and that is because ArrayList uses a fixed amount of array. However when you add an element to the ArrayList and it overflows, it creates a new Array and copies every element from the old one to the new one.