Generic in java

Generic enable type parameter of class, interface and methods. So that we can run same code using different input.Generic is introduce for type-safe object.

Generic also provide compile time type safety.we can detect compile time errors.for example

In any nontrivial software project, bugs are simply a fact of life. Careful planning, programming, and testing can help reduce their pervasiveness, but somehow, somewhere, they'll always find a way to creep into your code. This becomes especially apparent as new features are introduced and your code base grows in size and complexity.Fortunately, some bugs are easier to detect than others. Compile-time bugs, for example, can be detected early on; you can use the compiler's error messages to figure out what the problem is and fix it, right then and there. Runtime bugs, however, can be much more problematic; they don't always surface immediately, and when they do, it may be at a point in the program that is far removed from the actual cause of the problem.Generics add stability to your code by making more of your bugs detectable at compile time.

We can write a generic method to sort an array of objects. Then we can invoke integer array, string array into that method. So generic method can call with arguments of different type. So it is type safety.

```
public class Box {
    private Object object;

    public void set(Object object) { this.object = object; }
    public Object get() { return object; }
}
```

Since its methods accept or return an Object, you are free to pass in whatever you want, provided that it is not one of the primitive types. There is no way to verify, at compile time, how the class is used. One part of the code may place an Integer in the box and expect to get Integers out of it, while another part of the code may mistakenly pass in a String, resulting in a runtime error.

A generic class is defined with the following format:

```
class name<T1, T2, ..., Tn> { /* ... */ }
```

The type parameter section, delimited by angle brackets (<>), follows the class name. It specifies the type parameters (also called type variables) T1, T2, ..., and Tn.

To update the Box class to use generics, you create a generic type declaration by changing the code "public class Box" to "public class Box<T>". This introduces the type variable, T, that can be used anywhere inside the class.

With this change, the Box class becomes:

```
/**
 * Generic version of the Box class.
 * @param <T> the type of the value being boxed
 */
public class Box<T> {
    // T stands for "Type"
    private T t;

    public void set(T t) { this.t = t; }
    public T get() { return t; }
}
```

As you can see, all occurrences of Object are replaced by T. A type variable can be any **non-primitive** type you specify: any class type, any interface type, any array type, or even another type variable.

To reference the generic Box class from within your code, you must perform a generic type invocation, which replaces T with some concrete value, such as Integer:

```
Box<Integer> integerBox;
```