JAVA NOTES

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Chapter No 7

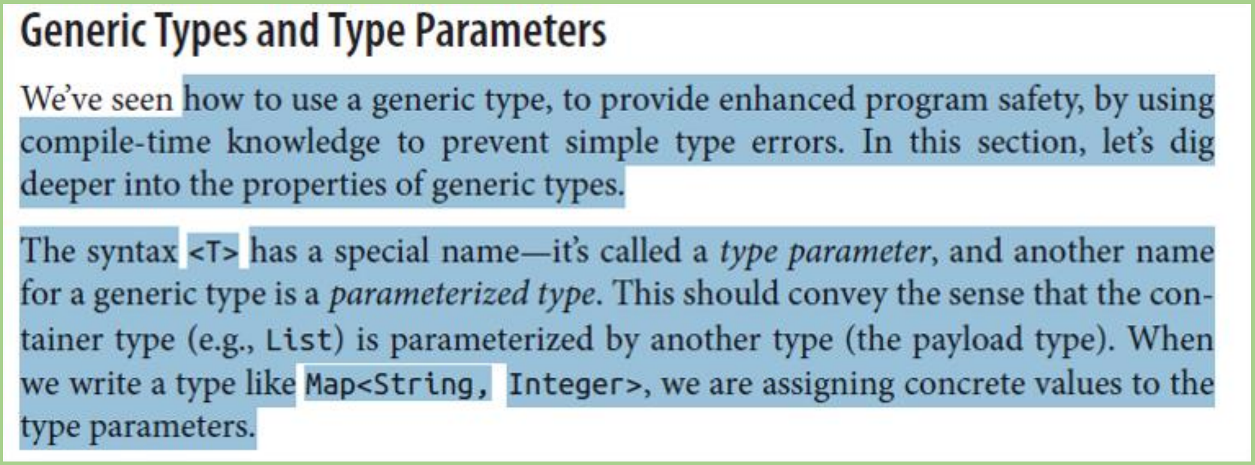
Generics

Q: Define the term “Generic”?

A program code written so as to operate on any data type, the data type required being passed as parameter.

Generic programming enables the programmer to create classes, interfaces and methods in which type of data is specified as a parameter. It provides a facility to write an algorithm independent of any specific type of data. Generics also provide type safety.

Q: Define generic types and type parameters?



Generic Types and Type Parameters

We’ve seen how to use a generic type, to provide enhanced program safety, by using compile-time knowledge to prevent simple type errors. In this section, let’s dig deeper into the properties of generic types.

The syntax `<T>` has a special name—it’s called a *type parameter*, and another name for a generic type is a *parameterized type*. This should convey the sense that the container type (e.g., `List`) is parameterized by another type (the payload type). When we write a type like `Map<String, Integer>`, we are assigning concrete values to the type parameters.

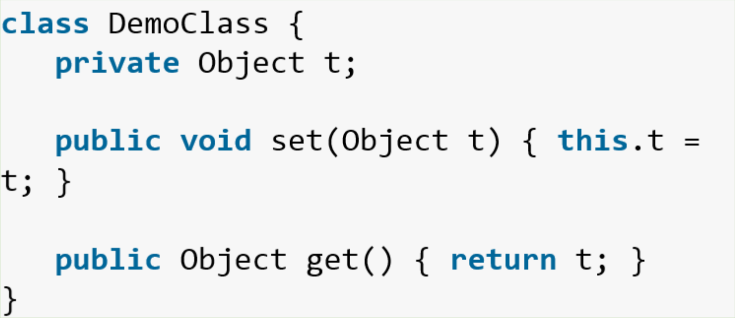
- All generic method declarations have a type parameter section delimited by angle brackets (< and >) that precedes the method's return type (< E > in the next example).

- Each type parameter section contains one or more type parameters separated by commas. A type parameter, also known as a type variable, is an identifier that specifies a generic type name.
- The type parameters can be used to declare the return type and act as placeholders for the types of the arguments passed to the generic method, which are known as actual type arguments.

Q: Describe generic classes and interfaces?

- A generic class declaration looks like a non-generic class declaration, except that the class name is followed by a type parameter section.
- As with generic methods, the type parameter section of a generic class can have one or more type parameters separated by commas. These classes are known as parameterized classes or parameterized types because they accept one or more parameters.
- A class is generic if it declares one or more type variables. These type variables are known as the type parameters of the class. Let's understand with an example.

- DemoClass is simple java class, which have one property t (can be more than one also); and type of property is Object.

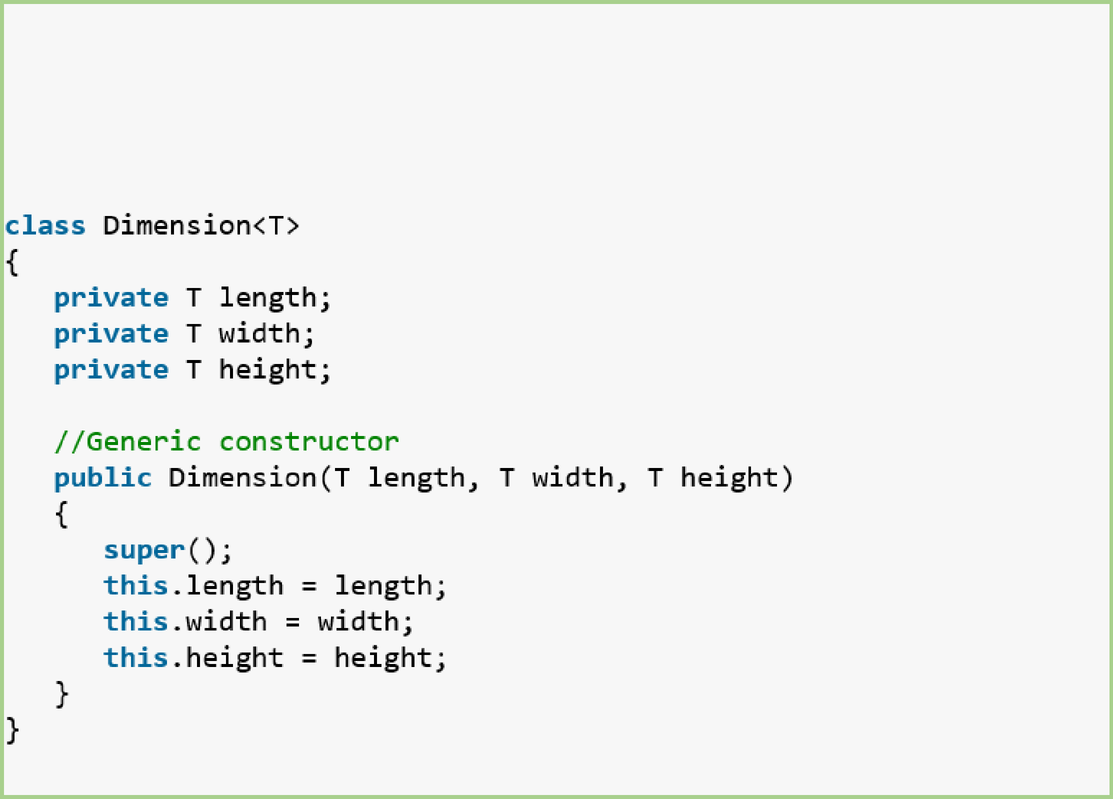


```java
class DemoClass {
   private Object t;

   public void set(Object t) { this.t =
t; }

   public Object get() { return t; }
}
```

Q: How to apply a generic method?



```java
class Dimension<T>
{
   private T length;
   private T width;
   private T height;

   //Generic constructor
   public Dimension(T length, T width, T height)
   {
      super();
      this.length = length;
      this.width = width;
      this.height = height;
   }
}
```

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