

## ➤ 31-Wrapper Classes

### ➤ **Introduction**

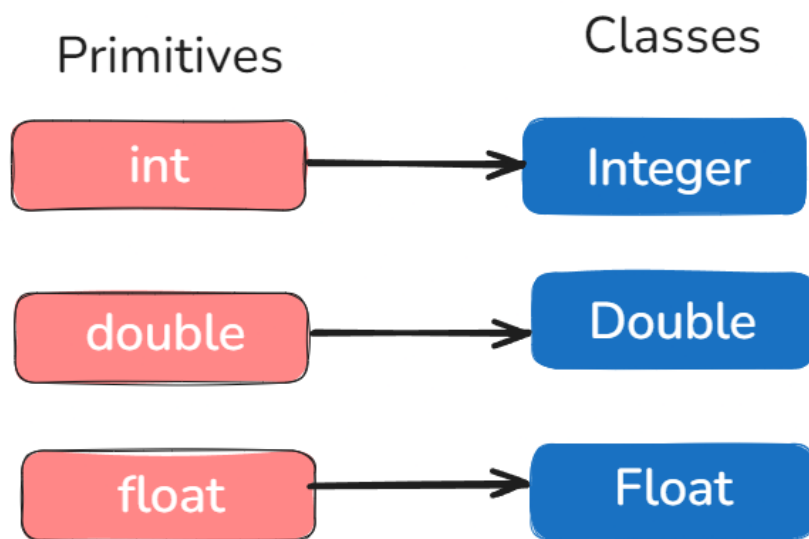
When discussing Java and Object-Oriented Programming (OOP), it's important to note that Java is not a purely object-oriented language. This is because it uses primitive data types such as `int` for integers, `double` or `float` for decimal values, and `char` for characters. These primitive data types are not objects, which contrasts with the OOP principle that everything should be an object.

### ➤ **Why Java is Not Purely Object-Oriented**

In a purely object-oriented language, all entities, including data types, must be represented as objects. However, in Java, primitive data types do not follow this principle, which is why Java is considered a **partially object-oriented language**.

### ➤ **Wrapper Classes in Java**

To bridge the gap between primitive types and the object-oriented nature of Java, the language provides **Wrapper Classes**. A Wrapper class in Java is a class whose object wraps or contains a primitive data type. When we create an object of a wrapper class, it encapsulates the primitive data type inside it. This allows the primitive data to be used in contexts that require objects.



### ➤ **Primitive Data Types and Their Corresponding Wrapper Classes**

For every primitive data type in Java, there is a corresponding wrapper class:

| Primitive Data Type | Wrapper Class          |
|---------------------|------------------------|
| <code>char</code>   | <code>Character</code> |
| <code>byte</code>   | <code>Byte</code>      |

| Primitive Data Type | Wrapper Class |
|---------------------|---------------|
| short               | Short         |
| int                 | Integer       |
| long                | Long          |
| float               | Float         |
| double              | Double        |
| boolean             | Boolean       |

➤ **Examples and Scenarios**

**Scenario 1: Primitive to Wrapper Type**

In this scenario, we convert a primitive type to its corresponding wrapper type.

```
public class Demo {  
    public static void main(String[] args) {  
        int num = 7;  
        Integer num1 = new Integer(8); // Deprecated  
        System.out.println(num1); // Output: 8  
    }  
}
```

***Note:** The use of `new Integer(8)` is deprecated in recent versions of Java. Instead, you should rely on autoboxing, where the conversion from a primitive type to a wrapper class is done automatically.*

➤ **Scenario 2: Autoboxing and Unboxing**

**Autoboxing:** The automatic conversion of a primitive type to the object of its corresponding wrapper class.

```
int num = 7;  
Integer num1 = num; // Autoboxing
```

**Unboxing:** The reverse process, where the object of a wrapper class is automatically converted back to its corresponding primitive type.

```
int num2 = num1; // Unboxing
System.out.println(num2); // Output: 7
```



### **Scenario 3: String to int Conversion**

This scenario demonstrates how to convert a String to an int using a wrapper class method.



### **Advantages of Wrapper Classes**

```
public class Demo {
    public static void main(String[] args) {
        String str = "12";
        int num3 = Integer.parseInt(str);
        System.out.println(num3 * 2); // Output: 24
    }
}
```

**Collections Framework:** Collections in Java can only hold objects, not primitive types. Wrapper classes enable the use of primitive data in collections like ArrayList, HashSet, etc.

**Method Operations:** Wrapper classes provide useful methods like compareTo(), equals(), and toString().

**Cloning:** Only objects can be cloned in Java, not primitives.

**Null Values:** Wrapper objects can be null, while primitives cannot.

**Serialization:** Serialization, the process of converting an object into a byte stream, only works with objects.



### **FAQs on Wrapper Classes**

#### **Which are the wrapper classes in Java?**

Wrapper classes in Java are classes whose objects encapsulate primitive data types.

#### **Why use the wrapper class in Java?**

Wrapper classes are used to convert primitive data types into objects, which is necessary when you want to modify arguments passed into a method or store primitives in collections.

#### **What are the 8 wrapper classes in Java?**

- The 8 wrapper classes in Java are Boolean, Byte, Short, Character, Integer, Long, Float, and Double.