Autoboxing and Unboxing in Java

Difficulty Level : Easy Last Updated : 24 Jan, 2022

In Java, primitive data types are treated differently so do there comes the introduction of wrapper classes where two components play a role namely Autoboxing and Unboxing. Autoboxing refers to the conversion of a primitive value into an object of the corresponding wrapper class is called autoboxing. For example, converting int to Integer class. The Java compiler applies autoboxing when a primitive value is:

- Passed as a parameter to a method that **expects an object** of the corresponding wrapper class.
- Assigned to a variable of the corresponding **wrapper class**.

Unboxing on the other hand refers to converting an object of a wrapper type to its corresponding primitive value. For example conversion of Integer to int. The Java compiler applies to unbox when an object of a wrapper class is:

- Passed as a parameter to a method that **expects a value** of the corresponding primitive type.
- Assigned to a variable of the corresponding **primitive type**.

Primitive Type	Wrapper Class
boolean	Boolean
byte	Byte
char	Character
float	Float
int	Integer
long	Long
short	Short
double	Double

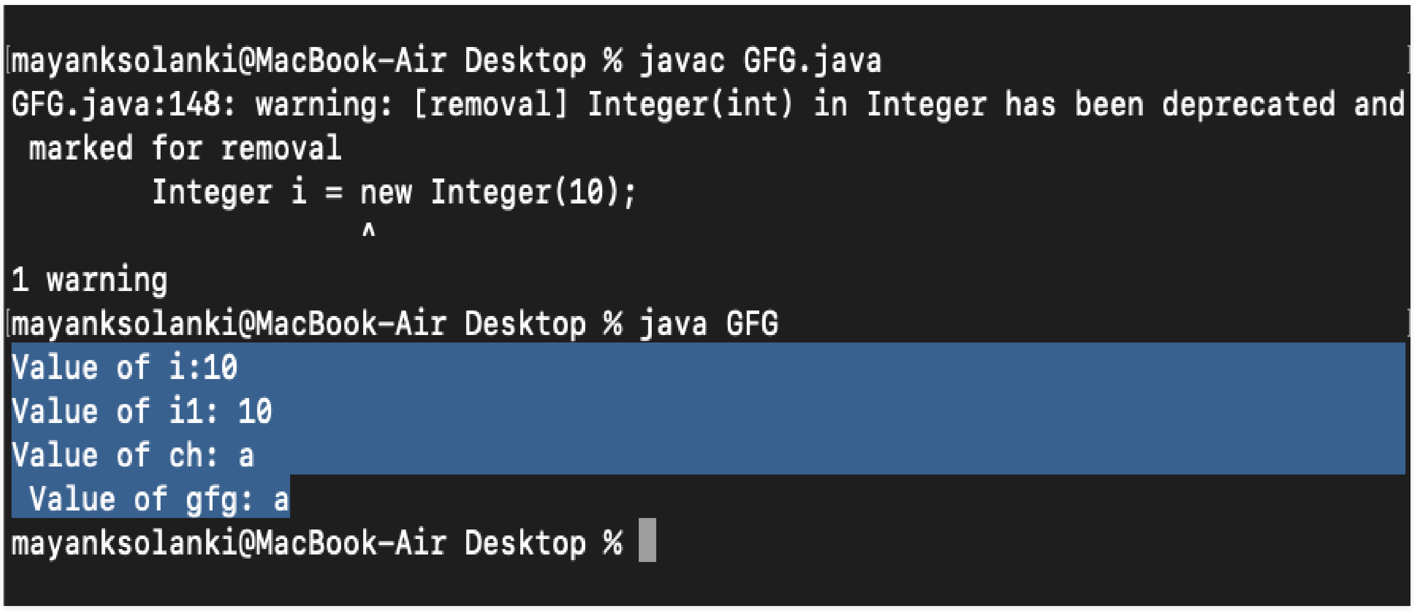
The following table lists the primitive types and their corresponding wrapper classes, which are used by the Java compiler for autoboxing and unboxing. Now let us discuss a few advantages of autoboxing and unboxing in order to get why we are using it.

- Autoboxing and unboxing lets developers write cleaner code, making it easier to read.
- The technique lets us use primitive types and Wrapper class objects interchangeably and we do not need to perform any typecasting explicitly.

Example 1:

```java
// Java program to illustrate the Concept
// of Autoboxing and Unboxing

// Importing required classes
import java.io.*;

// Main class
class GFG {

    // Main driver method
    public static void main(String[] args)
    {

        // Creating an Integer Object
        // with custom value say it be 10
        Integer i = new Integer(10);

        // Unboxing the Object
        int i1 = i;

        // Print statements
        System.out.println("Value of i:" + i);
        System.out.println("Value of i1: " + i1);

        // Autoboxing of character
        Character gfg = 'a';

        // Auto-unboxing of Character
        char ch = gfg;

        // Print statements
        System.out.println("Value of ch: " + ch);
        System.out.println(" Value of gfg: " + gfg);
    }
}
```

Output:


```
mayanksolanki@MacBook-Air Desktop % javac GFG.java
GFG.java:148: warning: [removal] Integer(int) in Integer has been deprecated and
 marked for removal
        Integer i = new Integer(10);
                    ^
1 warning
mayanksolanki@MacBook-Air Desktop % java GFG
Value of i:10
Value of i1: 10
Value of ch: a
 Value of gfg: a
mayanksolanki@MacBook-Air Desktop %
```

Let's understand how the compiler did autoboxing and unboxing in the example of Collections in Java using generics.

Example 2:

```java
// Java Program to Illustrate Autoboxing

// Importing required classes
import java.io.*;
import java.util.*;

// Main class
class GFG {

    // Main driver method
    public static void main(String[] args)
    {

        // Creating an empty Arraylist of integer type
        ArrayList<Integer> al = new ArrayList<Integer>();

        // Adding the int primitives type values
        // using add() method
        // Autoboxing
        al.add(1);
        al.add(2);
        al.add(24);

        // Printing the ArrayList elements
        System.out.println("ArrayList: " + al);
    }
}
```

Output

```
ArrayList: [1, 2, 24]
```

Output explanation:

In the above example, we have created a list of elements of the Integer type. We are adding int primitive type values instead of Integer Object and the code is successfully compiled. It does not generate a compile-time error as the Java compiler creates an Integer wrapper Object from primitive int i and adds it to the list.

Example 3:

```
// Java Program to Illustrate Autoboxing

// Importing required classes
import java.io.*;
import java.util.*;

// Main class
class GFG {

    // Main driver method
    public static void main(String[] args)
    {

        // Creating an empty ArrayList of integer type
        List<Integer> list = new ArrayList<Integer>();

        // Adding the int primitives type values by
        //  converting them into Integer wrapper object
        for (int i = 0; i < 10; i++)

            System.out.println(
                list.add(Integer.valueOf(i)));
    }
}
```

Output

```
true
true
true
true
true
true
true
true
true
true
```

Another example of auto and unboxing is to find the sum of odd numbers in a list. An important point in the program is that the operators remainder (%) and unary plus (+=) operators do not apply to Integer objects. But still, code compiles successfully because the unboxing of Integer Object to primitive int value is taking place by invoking intValue() method at runtime.

Example 4:

```
// Java Program to Illustrate Find Sum of Odd Numbers
// using Autobxing and Unboxing

// Importing required classes
import java.io.*;
import java.util.*;

// Main class
class GFG {

    // Method 1
    // To sum odd numbers
    public static int sumOfOddNumber(List<Integer> list)
    {
        // Initially setting sum to zero
        int sum = 0;

        for (Integer i : list) {

            // Unboxing of i automatically
            if (i % 2 != 0)
                sum += i;

            // Unboxing of i is done automatically
            // using intvalue implicitly
            if (i.intValue() % 2 != 0)
                sum += i.intValue();
        }

        // Returning the odd sum
        return sum;
    }

    // Method 2
    // Main driver method
    public static void main(String[] args)
    {

        // Creating an empty ArrayList of integer type
        List<Integer> list = new ArrayList<Integer>();

        // Adding the int primitives type values to List
        for (int i = 0; i < 10; i++)
            list.add(i);

        // Getting sum of all odd numbers in List
        int sumOdd = sumOfOddNumber(list);

        // Printing sum of odd numbers
        System.out.println("Sum of odd numbers = "
                           + sumOdd);
    }
}
```

Output

```
Sum of odd numbers = 50
```

This article is contributed by **Nitsdheerendra**. If you like GeeksforGeeks and would like to contribute, you can also write an article using write.geeksforgeeks.org or mail your article to review-team@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks. Please write comments if you find anything incorrect, or you want to share more information about the topic discussed above.