♥ Java Iterable Vs Iterator differences and know how

Posted on July 8, 2015 by Arulkumaran Kumaraswamipillai

Q1. What are the differences between Iterator<T> Vs Iterable<T>?

A1. The "**Iterable**" was introduced to be able to use in the "foreach" loop. A class implementing the Iterable interface can be iterated over. For example,

```
1 public interface Collection<E> extends Iterable<E
```

Hence, it can be used in the foreach loop

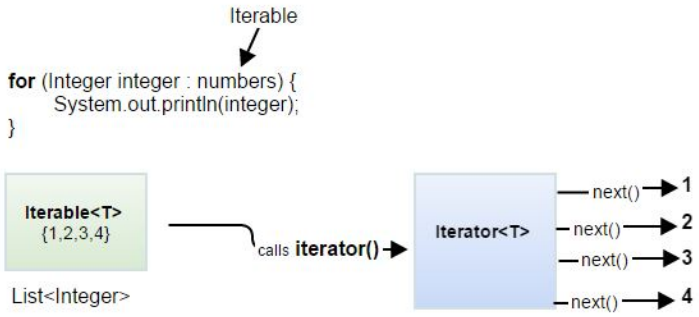
```
1  import java.util.Arrays;
2  import java.util.List;
3
4  public class IterableVsIterator {
5
```

```
6       public static void main(String[] args) {
7           //numbers is iterable as List<E> extends
8           //Collection<E> extends Iterable<E>
9           List<Integer> numbers = Arrays.asList(ne
10          for (Integer integer : numbers) {
11              System.out.println(integer);
12          }
13      }
14  }
```

The Iterable interface has one method iterator()

```
1  Iterator<T> iterator()
```

So, what happens in the foreach loop?

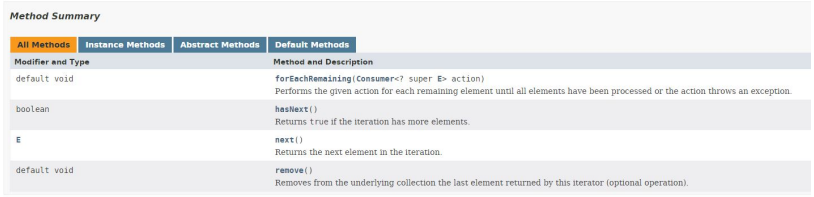


foreach -> Iterator() -next()

What is an Iterator()?

Iterator is class that manages iteration over an **Iterable**. It maintains a state of where we are in the current iteration, and knows what the next element is and how to get it.

Here is the **Iterator()** API methods.



Method Summary

All Methods | Instance Methods | Abstract Methods | Default Methods

Modifier and Type	Method and Description
default void	forEachRemaining(Consumer<? super E> action) Performs the given action for each remaining element until all elements have been processed or the action throws an exception.
boolean	hasNext() Returns true if the iteration has more elements.
E	next() Returns the next element in the iteration.
default void	remove() Removes from the underlying collection the last element returned by this iterator (optional operation).

16 Technical Key Areas

Java Iterator methods

Iterable can be rewound

You can **rewind** an Iterable by getting a new iterator() from the Iterable. But an Iterator only has the next() method. So, an Iterable is handy if you want to traverse the elements more than once.

Q2. How do you get an **Iterable** in Java 8 to be used in a foreach loop?
A2. In Java 8, when you call the double "**::**" notation as shown below, you get an Iterable from the Stream.

So, given a Stream s, the following results in an Iterable:

```
1 s::iterator
```

If you want to use this directly in an enhanced-for loop, you have to apply a cast in order to establish a target type for the method reference.

Here is the complete code:

```
1  package com.read.file;
2
3  import java.net.URL;
4  import java.nio.charset.StandardCharsets;
5  import java.nio.file.Files;
6  import java.nio.file.Path;
7  import java.nio.file.Paths;
8  import java.util.stream.Stream;
9
10 public class MyFileReader {
11
12     public static void main(String[] args) {
13         Path file = null;
14         try
15         {
16             //read from the classpath
17             URL url = MyFileReader.class.getReso
18             file = Paths.get(url.toURI());
19
20             //Java 8: Stream class
21             Stream<String> lines = Files.lines(
22
```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```
23              for( String line : (Iterable<String>
24              {
25                  System.out.println("read=" + lin
26              }
27
28          } catch (Exception e){
29              e.printStackTrace();
30          }
31      }
32  }
```

Here is Iterator and Iterable in action via a custom Iterable class

This is the **Iterator** design pattern in action.

```
1  import java.util.Iterator;
2
3  public class MyIterable<T> implements Iterable<T
4
5      public T[] a= null;
6
7      public MyIterable(T[] array){
8          this.a = array;
9      }
10
11     @Override
12     public Iterator<T> iterator() {
13         return new Iterator<T>() {
14             private int count=0;
15
16             public boolean hasNext(){
17                 return count < a.length;
18             }
19             public T next(){
20                 System.out.println("Invoking nex
21                 return a[count++];
22             }
23
24             public void remove(){
25                 throw new UnsupportedOperationEx
26             }
27         };
28     }
29 }
```

Now, using the above class

```
1  public class IterableVsIterator {
2
3      public static void main(String[] args) {
4          String[] technologies = {"Java", "JEE",
5          MyIterable<String> entries = new MyItera
6          for (String tech : entries) {
```

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```
7                System.out.println(tech);
8            }
9        }
10 }
```

Output:

```
1 Invoking next()
2 Java
3 Invoking next()
4 JEE
5 Invoking next()
6 XML
```

The “Invoking next()” is printed from the **iterator()** anonymous class’s **next()** method.

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