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[Skip navigation links](#1fob9te)

* [Overview](http://docs.google.com/overview-summary.html)
* [Package](http://docs.google.com/package-summary.html)
* Class
* [Use](http://docs.google.com/class-use/ObjectGraphIterator.html)
* [Tree](http://docs.google.com/package-tree.html)
* [Deprecated](http://docs.google.com/deprecated-list.html)
* [Index](http://docs.google.com/index-all.html)
* [Help](http://docs.google.com/help-doc.html)
* [Prev Class](http://docs.google.com/org/apache/commons/collections4/iterators/ObjectArrayListIterator.html)
* [Next Class](http://docs.google.com/org/apache/commons/collections4/iterators/PeekingIterator.html)
* [Frames](http://docs.google.com/index.html?org/apache/commons/collections4/iterators/ObjectGraphIterator.html)
* [No Frames](http://docs.google.com/ObjectGraphIterator.html)
* [All Classes](http://docs.google.com/allclasses-noframe.html)
* Summary:
* Nested |
* Field |
* [Constr](#3znysh7) |
* [Method](#2et92p0)
* Detail:
* Field |
* [Constr](#1t3h5sf) |
* [Method](#3rdcrjn)

org.apache.commons.collections4.iterators

## Class ObjectGraphIterator<E>

* [java.lang.Object](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true)
  + org.apache.commons.collections4.iterators.ObjectGraphIterator<E>
* All Implemented Interfaces: [Iterator](https://docs.oracle.com/javase/7/docs/api/java/util/Iterator.html?is-external=true)<E>  
    
  public class ObjectGraphIterator<E>  
  extends [Object](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true)  
  implements [Iterator](https://docs.oracle.com/javase/7/docs/api/java/util/Iterator.html?is-external=true)<E>  
  An Iterator that can traverse multiple iterators down an object graph.  
  This iterator can extract multiple objects from a complex tree-like object graph. The iteration starts from a single root object. It uses a Transformer to extract the iterators and elements. Its main benefit is that no intermediate List is created.  
  For example, consider an object graph:  
   |- Branch -- Leaf  
   | \- Leaf  
   |- Tree | /- Leaf  
   | |- Branch -- Leaf  
   Forest | \- Leaf  
   | |- Branch -- Leaf  
   | | \- Leaf  
   |- Tree | /- Leaf  
   |- Branch -- Leaf  
   |- Branch -- LeafThe following Transformer, used in this class, will extract all the Leaf objects without creating a combined intermediate list:  
   public Object transform(Object input) {  
   if (input instanceof Forest) {  
   return ((Forest) input).treeIterator();  
   }  
   if (input instanceof Tree) {  
   return ((Tree) input).branchIterator();  
   }  
   if (input instanceof Branch) {  
   return ((Branch) input).leafIterator();  
   }  
   if (input instanceof Leaf) {  
   return input;  
   }  
   throw new ClassCastException();  
   }  
  Internally, iteration starts from the root object. When next is called, the transformer is called to examine the object. The transformer will return either an iterator or an object. If the object is an Iterator, the next element from that iterator is obtained and the process repeats. If the element is an object it is returned.  
  Under many circumstances, linking Iterators together in this manner is more efficient (and convenient) than using nested for loops to extract a list.Since: 3.1

### Constructor SummaryConstructors

|  |
| --- |
| * + Constructor and Description |
| * + [ObjectGraphIterator](http://docs.google.com/org/apache/commons/collections4/iterators/ObjectGraphIterator.html#ObjectGraphIterator-E-org.apache.commons.collections4.Transformer-)([E](http://docs.google.com/org/apache/commons/collections4/iterators/ObjectGraphIterator.html) root, [Transformer](http://docs.google.com/org/apache/commons/collections4/Transformer.html)<? super [E](http://docs.google.com/org/apache/commons/collections4/iterators/ObjectGraphIterator.html),? extends [E](http://docs.google.com/org/apache/commons/collections4/iterators/ObjectGraphIterator.html)> transformer) Constructs an ObjectGraphIterator using a root object and transformer. |
| * + [ObjectGraphIterator](http://docs.google.com/org/apache/commons/collections4/iterators/ObjectGraphIterator.html#ObjectGraphIterator-java.util.Iterator-)([Iterator](https://docs.oracle.com/javase/7/docs/api/java/util/Iterator.html?is-external=true)<? extends [E](http://docs.google.com/org/apache/commons/collections4/iterators/ObjectGraphIterator.html)> rootIterator) Constructs a ObjectGraphIterator that will handle an iterator of iterators. |

### Method SummaryAll Methods Instance Methods Concrete Methods

|  |  |
| --- | --- |
| * + Modifier and Type | * + Method and Description |
| * + protected void | * + [findNext](http://docs.google.com/org/apache/commons/collections4/iterators/ObjectGraphIterator.html#findNext-E-)([E](http://docs.google.com/org/apache/commons/collections4/iterators/ObjectGraphIterator.html) value) Finds the next object in the iteration given any start object. |
| * + protected void | * + [findNextByIterator](http://docs.google.com/org/apache/commons/collections4/iterators/ObjectGraphIterator.html#findNextByIterator-java.util.Iterator-)([Iterator](https://docs.oracle.com/javase/7/docs/api/java/util/Iterator.html?is-external=true)<? extends [E](http://docs.google.com/org/apache/commons/collections4/iterators/ObjectGraphIterator.html)> iterator) Finds the next object in the iteration given an iterator. |
| * + boolean | * + [hasNext](http://docs.google.com/org/apache/commons/collections4/iterators/ObjectGraphIterator.html#hasNext--)() Checks whether there are any more elements in the iteration to obtain. |
| * + [E](http://docs.google.com/org/apache/commons/collections4/iterators/ObjectGraphIterator.html) | * + [next](http://docs.google.com/org/apache/commons/collections4/iterators/ObjectGraphIterator.html#next--)() Gets the next element of the iteration. |
| * + void | * + [remove](http://docs.google.com/org/apache/commons/collections4/iterators/ObjectGraphIterator.html#remove--)() Removes from the underlying collection the last element returned. |
| * + protected void | * + [updateCurrentIterator](http://docs.google.com/org/apache/commons/collections4/iterators/ObjectGraphIterator.html#updateCurrentIterator--)() Loops around the iterators to find the next value to return. |

### Methods inherited from class java.lang.[**Object**](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true)[clone](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true#clone--), [equals](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true#equals-java.lang.Object-), [finalize](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true#finalize--), [getClass](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true#getClass--), [hashCode](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true#hashCode--), [notify](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true#notify--), [notifyAll](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true#notifyAll--), [toString](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true#toString--), [wait](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true#wait--), [wait](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true#wait-long-), [wait](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true#wait-long-int-)

### Methods inherited from interface java.util.[**Iterator**](https://docs.oracle.com/javase/7/docs/api/java/util/Iterator.html?is-external=true)[forEachRemaining](https://docs.oracle.com/javase/7/docs/api/java/util/Iterator.html?is-external=true#forEachRemaining-java.util.function.Consumer-)

### Constructor Detail

#### ObjectGraphIterator public ObjectGraphIterator([E](http://docs.google.com/org/apache/commons/collections4/iterators/ObjectGraphIterator.html) root, [Transformer](http://docs.google.com/org/apache/commons/collections4/Transformer.html)<? super [E](http://docs.google.com/org/apache/commons/collections4/iterators/ObjectGraphIterator.html),? extends [E](http://docs.google.com/org/apache/commons/collections4/iterators/ObjectGraphIterator.html)> transformer) Constructs an ObjectGraphIterator using a root object and transformer. The root object can be an iterator, in which case it will be immediately looped around.Parameters: root - the root object, null will result in an empty iterator transformer - the transformer to use, null will use a no effect transformer

#### ObjectGraphIterator public ObjectGraphIterator([Iterator](https://docs.oracle.com/javase/7/docs/api/java/util/Iterator.html?is-external=true)<? extends [E](http://docs.google.com/org/apache/commons/collections4/iterators/ObjectGraphIterator.html)> rootIterator) Constructs a ObjectGraphIterator that will handle an iterator of iterators. This constructor exists for convenience to emphasise that this class can be used to iterate over nested iterators. That is to say that the iterator passed in here contains other iterators, which may in turn contain further iterators.Parameters: rootIterator - the root iterator, null will result in an empty iterator

### Method Detail

#### updateCurrentIterator protected void updateCurrentIterator() Loops around the iterators to find the next value to return.

#### findNext protected void findNext([E](http://docs.google.com/org/apache/commons/collections4/iterators/ObjectGraphIterator.html) value) Finds the next object in the iteration given any start object.Parameters: value - the value to start from

#### findNextByIterator protected void findNextByIterator([Iterator](https://docs.oracle.com/javase/7/docs/api/java/util/Iterator.html?is-external=true)<? extends [E](http://docs.google.com/org/apache/commons/collections4/iterators/ObjectGraphIterator.html)> iterator) Finds the next object in the iteration given an iterator.Parameters: iterator - the iterator to start from

#### hasNext public boolean hasNext() Checks whether there are any more elements in the iteration to obtain.Specified by: [hasNext](https://docs.oracle.com/javase/7/docs/api/java/util/Iterator.html?is-external=true#hasNext--) in interface [Iterator](https://docs.oracle.com/javase/7/docs/api/java/util/Iterator.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/iterators/ObjectGraphIterator.html)> Returns: true if elements remain in the iteration

#### next public [E](http://docs.google.com/org/apache/commons/collections4/iterators/ObjectGraphIterator.html) next() Gets the next element of the iteration.Specified by: [next](https://docs.oracle.com/javase/7/docs/api/java/util/Iterator.html?is-external=true#next--) in interface [Iterator](https://docs.oracle.com/javase/7/docs/api/java/util/Iterator.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/iterators/ObjectGraphIterator.html)> Returns: the next element from the iteration Throws: [NoSuchElementException](https://docs.oracle.com/javase/7/docs/api/java/util/NoSuchElementException.html?is-external=true) - if all the Iterators are exhausted

#### remove public void remove() Removes from the underlying collection the last element returned. This method calls remove() on the underlying Iterator and it may throw an UnsupportedOperationException if the underlying Iterator does not support this method.Specified by: [remove](https://docs.oracle.com/javase/7/docs/api/java/util/Iterator.html?is-external=true#remove--) in interface [Iterator](https://docs.oracle.com/javase/7/docs/api/java/util/Iterator.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/iterators/ObjectGraphIterator.html)> Throws: [UnsupportedOperationException](https://docs.oracle.com/javase/7/docs/api/java/lang/UnsupportedOperationException.html?is-external=true) - if the remove operator is not supported by the underlying Iterator [IllegalStateException](https://docs.oracle.com/javase/7/docs/api/java/lang/IllegalStateException.html?is-external=true) - if the next method has not yet been called, or the remove method has already been called after the last call to the next method.

[Skip navigation links](#4i7ojhp)

* [Overview](http://docs.google.com/overview-summary.html)
* [Package](http://docs.google.com/package-summary.html)
* Class
* [Use](http://docs.google.com/class-use/ObjectGraphIterator.html)
* [Tree](http://docs.google.com/package-tree.html)
* [Deprecated](http://docs.google.com/deprecated-list.html)
* [Index](http://docs.google.com/index-all.html)
* [Help](http://docs.google.com/help-doc.html)
* [Prev Class](http://docs.google.com/org/apache/commons/collections4/iterators/ObjectArrayListIterator.html)
* [Next Class](http://docs.google.com/org/apache/commons/collections4/iterators/PeekingIterator.html)
* [Frames](http://docs.google.com/index.html?org/apache/commons/collections4/iterators/ObjectGraphIterator.html)
* [No Frames](http://docs.google.com/ObjectGraphIterator.html)
* [All Classes](http://docs.google.com/allclasses-noframe.html)
* Summary:
* Nested |
* Field |
* [Constr](#3znysh7) |
* [Method](#2et92p0)
* Detail:
* Field |
* [Constr](#1t3h5sf) |
* [Method](#3rdcrjn)

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