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org.apache.commons.collections4.list

## Class CursorableLinkedList<E>

* [java.lang.Object](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true)
  + [org.apache.commons.collections4.list.AbstractLinkedList](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html)<E>
    - org.apache.commons.collections4.list.CursorableLinkedList<E>
* All Implemented Interfaces: [Serializable](https://docs.oracle.com/javase/7/docs/api/java/io/Serializable.html?is-external=true), [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<E>, [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<E>, [List](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true)<E>  
    
  public class CursorableLinkedList<E>  
  extends [AbstractLinkedList](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html)<E>  
  implements [Serializable](https://docs.oracle.com/javase/7/docs/api/java/io/Serializable.html?is-external=true)  
  A List implementation with a ListIterator that allows concurrent modifications to the underlying list.  
  This implementation supports all of the optional [List](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true) operations. It extends AbstractLinkedList and thus provides the stack/queue/dequeue operations available in [LinkedList](https://docs.oracle.com/javase/7/docs/api/java/util/LinkedList.html?is-external=true).  
  The main feature of this class is the ability to modify the list and the iterator at the same time. Both the [listIterator()](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html#listIterator--) and [cursor()](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html#cursor--) methods provides access to a Cursor instance which extends ListIterator. The cursor allows changes to the list concurrent with changes to the iterator. Note that the [iterator()](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html#iterator--) method and sublists do **not** provide this cursor behaviour.  
  The Cursor class is provided partly for backwards compatibility and partly because it allows the cursor to be directly closed. Closing the cursor is optional because references are held via a WeakReference. For most purposes, simply modify the iterator and list at will, and then let the garbage collector to the rest.  
  **Note that this implementation is not synchronized.**Since: 1.0 See Also: [LinkedList](https://docs.oracle.com/javase/7/docs/api/java/util/LinkedList.html?is-external=true), [Serialized Form](http://docs.google.com/serialized-form.html#org.apache.commons.collections4.list.CursorableLinkedList)

### Nested Class SummaryNested Classes

|  |  |
| --- | --- |
| * + Modifier and Type | * + Class and Description |
| * + static class | * + [CursorableLinkedList.Cursor](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.Cursor.html)<[E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.Cursor.html)> An extended ListIterator that allows concurrent changes to the underlying list. |
| * + protected static class | * + [CursorableLinkedList.SubCursor](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.SubCursor.html)<[E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.SubCursor.html)> A cursor for the sublist based on LinkedSubListIterator. |

### Nested classes/interfaces inherited from class org.apache.commons.collections4.list.[**AbstractLinkedList**](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html)[AbstractLinkedList.LinkedListIterator](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.LinkedListIterator.html)<[E](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.LinkedListIterator.html)>, [AbstractLinkedList.LinkedSubList](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.LinkedSubList.html)<[E](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.LinkedSubList.html)>, [AbstractLinkedList.LinkedSubListIterator](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.LinkedSubListIterator.html)<[E](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.LinkedSubListIterator.html)>, [AbstractLinkedList.Node](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.Node.html)<[E](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.Node.html)>

### Constructor SummaryConstructors

|  |
| --- |
| * + Constructor and Description |
| * + [CursorableLinkedList](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html#CursorableLinkedList--)() Constructor that creates. |
| * + [CursorableLinkedList](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html#CursorableLinkedList-java.util.Collection-)([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<? extends [E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html)> coll) Constructor that copies the specified collection |

### Method SummaryAll Methods Instance Methods Concrete Methods

|  |  |
| --- | --- |
| * + Modifier and Type | * + Method and Description |
| * + protected void | * + [addNode](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html#addNode-org.apache.commons.collections4.list.AbstractLinkedList.Node-org.apache.commons.collections4.list.AbstractLinkedList.Node-)([AbstractLinkedList.Node](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.Node.html)<[E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html)> nodeToInsert, [AbstractLinkedList.Node](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.Node.html)<[E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html)> insertBeforeNode) Inserts a new node into the list. |
| * + protected void | * + [broadcastNodeChanged](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html#broadcastNodeChanged-org.apache.commons.collections4.list.AbstractLinkedList.Node-)([AbstractLinkedList.Node](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.Node.html)<[E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html)> node) Informs all of my registered cursors that the specified element was changed. |
| * + protected void | * + [broadcastNodeInserted](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html#broadcastNodeInserted-org.apache.commons.collections4.list.AbstractLinkedList.Node-)([AbstractLinkedList.Node](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.Node.html)<[E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html)> node) Informs all of my registered cursors that the specified element was just added to my list. |
| * + protected void | * + [broadcastNodeRemoved](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html#broadcastNodeRemoved-org.apache.commons.collections4.list.AbstractLinkedList.Node-)([AbstractLinkedList.Node](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.Node.html)<[E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html)> node) Informs all of my registered cursors that the specified element was just removed from my list. |
| * + protected [ListIterator](https://docs.oracle.com/javase/7/docs/api/java/util/ListIterator.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html)> | * + [createSubListListIterator](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html#createSubListListIterator-org.apache.commons.collections4.list.AbstractLinkedList.LinkedSubList-int-)([AbstractLinkedList.LinkedSubList](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.LinkedSubList.html)<[E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html)> subList, int fromIndex) Creates a list iterator for the sublist. |
| * + [CursorableLinkedList.Cursor](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.Cursor.html)<[E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html)> | * + [cursor](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html#cursor--)() Returns a [CursorableLinkedList.Cursor](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.Cursor.html) for iterating through the elements of this list. |
| * + [CursorableLinkedList.Cursor](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.Cursor.html)<[E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html)> | * + [cursor](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html#cursor-int-)(int fromIndex) Returns a [CursorableLinkedList.Cursor](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.Cursor.html) for iterating through the elements of this list starting from a specified index. |
| * + protected void | * + [init](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html#init--)() The equivalent of a default constructor called by any constructor and by readObject. |
| * + [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/list/CursorableLinkedList.html)> | * + [iterator](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html#iterator--)() Returns an iterator that does **not** support concurrent modification. |
| * + [ListIterator](https://docs.oracle.com/javase/7/docs/api/java/util/ListIterator.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html)> | * + [listIterator](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html#listIterator--)() Returns a cursor iterator that allows changes to the underlying list in parallel. |
| * + [ListIterator](https://docs.oracle.com/javase/7/docs/api/java/util/ListIterator.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html)> | * + [listIterator](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html#listIterator-int-)(int fromIndex) Returns a cursor iterator that allows changes to the underlying list in parallel. |
| * + protected void | * + [registerCursor](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html#registerCursor-org.apache.commons.collections4.list.CursorableLinkedList.Cursor-)([CursorableLinkedList.Cursor](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.Cursor.html)<[E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html)> cursor) Registers a cursor to be notified of changes to this list. |
| * + protected void | * + [removeAllNodes](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html#removeAllNodes--)() Removes all nodes by iteration. |
| * + protected void | * + [removeNode](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html#removeNode-org.apache.commons.collections4.list.AbstractLinkedList.Node-)([AbstractLinkedList.Node](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.Node.html)<[E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html)> node) Removes the specified node from the list. |
| * + protected void | * + [unregisterCursor](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html#unregisterCursor-org.apache.commons.collections4.list.CursorableLinkedList.Cursor-)([CursorableLinkedList.Cursor](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.Cursor.html)<[E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html)> cursor) Deregisters a cursor from the list to be notified of changes. |
| * + protected void | * + [updateNode](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html#updateNode-org.apache.commons.collections4.list.AbstractLinkedList.Node-E-)([AbstractLinkedList.Node](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.Node.html)<[E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html)> node, [E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html) value) Updates the node with a new value. |

### Methods inherited from class org.apache.commons.collections4.list.[**AbstractLinkedList**](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html)[add](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html#add-E-), [add](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html#add-int-E-), [addAll](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html#addAll-java.util.Collection-), [addAll](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html#addAll-int-java.util.Collection-), [addFirst](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html#addFirst-E-), [addLast](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html#addLast-E-), [addNodeAfter](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html#addNodeAfter-org.apache.commons.collections4.list.AbstractLinkedList.Node-E-), [addNodeBefore](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html#addNodeBefore-org.apache.commons.collections4.list.AbstractLinkedList.Node-E-), [clear](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html#clear--), [contains](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html#contains-java.lang.Object-), [containsAll](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html#containsAll-java.util.Collection-), [createHeaderNode](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html#createHeaderNode--), [createNode](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html#createNode-E-), [createSubListIterator](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html#createSubListIterator-org.apache.commons.collections4.list.AbstractLinkedList.LinkedSubList-), [doReadObject](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html#doReadObject-java.io.ObjectInputStream-), [doWriteObject](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html#doWriteObject-java.io.ObjectOutputStream-), [equals](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html#equals-java.lang.Object-), [get](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html#get-int-), [getFirst](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html#getFirst--), [getLast](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html#getLast--), [getNode](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html#getNode-int-boolean-), [hashCode](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html#hashCode--), [indexOf](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html#indexOf-java.lang.Object-), [isEmpty](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html#isEmpty--), [isEqualValue](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html#isEqualValue-java.lang.Object-java.lang.Object-), [lastIndexOf](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html#lastIndexOf-java.lang.Object-), [remove](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html#remove-int-), [remove](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html#remove-java.lang.Object-), [removeAll](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html#removeAll-java.util.Collection-), [removeFirst](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html#removeFirst--), [removeLast](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html#removeLast--), [retainAll](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html#retainAll-java.util.Collection-), [set](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html#set-int-E-), [size](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html#size--), [subList](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html#subList-int-int-), [toArray](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html#toArray--), [toArray](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html#toArray-T:A-), [toString](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html#toString--)

### 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--), [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--), [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--), [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.[**List**](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true)[replaceAll](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true#replaceAll-java.util.function.UnaryOperator-), [sort](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true#sort-java.util.Comparator-), [spliterator](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true#spliterator--)

### Methods inherited from interface java.util.[**Collection**](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)[parallelStream](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true#parallelStream--), [removeIf](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true#removeIf-java.util.function.Predicate-), [stream](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true#stream--)

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

### Constructor Detail

#### CursorableLinkedList public CursorableLinkedList() Constructor that creates.

#### CursorableLinkedList public CursorableLinkedList([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<? extends [E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html)> coll) Constructor that copies the specified collectionParameters: coll - the collection to copy

### Method Detail

#### init protected void init() The equivalent of a default constructor called by any constructor and by readObject.Overrides: [init](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html#init--) in class [AbstractLinkedList](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html)<[E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html)>

#### iterator public [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/list/CursorableLinkedList.html)> iterator() Returns an iterator that does **not** support concurrent modification. If the underlying list is modified while iterating using this iterator a ConcurrentModificationException will occur. The cursor behaviour is available via [listIterator()](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html#listIterator--).Specified by: [iterator](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true#iterator--) in interface [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html)> Specified by: [iterator](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true#iterator--) in interface [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html)> Specified by: [iterator](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true#iterator--) in interface [List](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html)> Overrides: [iterator](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html#iterator--) in class [AbstractLinkedList](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html)<[E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html)> Returns: a new iterator that does **not** support concurrent modification

#### listIterator public [ListIterator](https://docs.oracle.com/javase/7/docs/api/java/util/ListIterator.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html)> listIterator() Returns a cursor iterator that allows changes to the underlying list in parallel. The cursor enables iteration and list changes to occur in any order without invalidating the iterator (from one thread). When elements are added to the list, an event is fired to all active cursors enabling them to adjust to the change in the list. When the "current" (i.e., last returned by [ListIterator.next()](https://docs.oracle.com/javase/7/docs/api/java/util/ListIterator.html?is-external=true#next--) or [ListIterator.previous()](https://docs.oracle.com/javase/7/docs/api/java/util/ListIterator.html?is-external=true#previous--)) element of the list is removed, the cursor automatically adjusts to the change (invalidating the last returned value such that it cannot be removed).Specified by: [listIterator](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true#listIterator--) in interface [List](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html)> Overrides: [listIterator](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html#listIterator--) in class [AbstractLinkedList](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html)<[E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html)> Returns: a new cursor iterator

#### listIterator public [ListIterator](https://docs.oracle.com/javase/7/docs/api/java/util/ListIterator.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html)> listIterator(int fromIndex) Returns a cursor iterator that allows changes to the underlying list in parallel. The cursor enables iteration and list changes to occur in any order without invalidating the iterator (from one thread). When elements are added to the list, an event is fired to all active cursors enabling them to adjust to the change in the list. When the "current" (i.e., last returned by [ListIterator.next()](https://docs.oracle.com/javase/7/docs/api/java/util/ListIterator.html?is-external=true#next--) or [ListIterator.previous()](https://docs.oracle.com/javase/7/docs/api/java/util/ListIterator.html?is-external=true#previous--)) element of the list is removed, the cursor automatically adjusts to the change (invalidating the last returned value such that it cannot be removed).Specified by: [listIterator](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true#listIterator-int-) in interface [List](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html)> Overrides: [listIterator](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html#listIterator-int-) in class [AbstractLinkedList](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html)<[E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html)> Parameters: fromIndex - the index to start from Returns: a new cursor iterator

#### cursor public [CursorableLinkedList.Cursor](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.Cursor.html)<[E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html)> cursor() Returns a [CursorableLinkedList.Cursor](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.Cursor.html) for iterating through the elements of this list. A Cursor is a ListIterator with an additional close() method. Calling this method immediately discards the references to the cursor. If it is not called, then the garbage collector will still remove the reference as it is held via a WeakReference. The cursor enables iteration and list changes to occur in any order without invalidating the iterator (from one thread). When elements are added to the list, an event is fired to all active cursors enabling them to adjust to the change in the list. When the "current" (i.e., last returned by [ListIterator.next()](https://docs.oracle.com/javase/7/docs/api/java/util/ListIterator.html?is-external=true#next--) or [ListIterator.previous()](https://docs.oracle.com/javase/7/docs/api/java/util/ListIterator.html?is-external=true#previous--)) element of the list is removed, the cursor automatically adjusts to the change (invalidating the last returned value such that it cannot be removed). The [listIterator()](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html#listIterator--) method returns the same as this method, and can be cast to a Cursor if the close method is required.Returns: a new cursor iterator

#### cursor public [CursorableLinkedList.Cursor](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.Cursor.html)<[E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html)> cursor(int fromIndex) Returns a [CursorableLinkedList.Cursor](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.Cursor.html) for iterating through the elements of this list starting from a specified index. A Cursor is a ListIterator with an additional close() method. Calling this method immediately discards the references to the cursor. If it is not called, then the garbage collector will still remove the reference as it is held via a WeakReference. The cursor enables iteration and list changes to occur in any order without invalidating the iterator (from one thread). When elements are added to the list, an event is fired to all active cursors enabling them to adjust to the change in the list. When the "current" (i.e., last returned by [ListIterator.next()](https://docs.oracle.com/javase/7/docs/api/java/util/ListIterator.html?is-external=true#next--) or [ListIterator.previous()](https://docs.oracle.com/javase/7/docs/api/java/util/ListIterator.html?is-external=true#previous--)) element of the list is removed, the cursor automatically adjusts to the change (invalidating the last returned value such that it cannot be removed). The [listIterator(int)](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html#listIterator-int-) method returns the same as this method, and can be cast to a Cursor if the close method is required.Parameters: fromIndex - the index to start from Returns: a new cursor iterator Throws: [IndexOutOfBoundsException](https://docs.oracle.com/javase/7/docs/api/java/lang/IndexOutOfBoundsException.html?is-external=true) - if the index is out of range (index < 0 || index > size()).

#### updateNode protected void updateNode([AbstractLinkedList.Node](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.Node.html)<[E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html)> node, [E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html) value) Updates the node with a new value. This implementation sets the value on the node. Subclasses can override this to record the change.Overrides: [updateNode](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html#updateNode-org.apache.commons.collections4.list.AbstractLinkedList.Node-E-) in class [AbstractLinkedList](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html)<[E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html)> Parameters: node - node to update value - new value of the node

#### addNode protected void addNode([AbstractLinkedList.Node](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.Node.html)<[E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html)> nodeToInsert, [AbstractLinkedList.Node](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.Node.html)<[E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html)> insertBeforeNode) Inserts a new node into the list.Overrides: [addNode](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html#addNode-org.apache.commons.collections4.list.AbstractLinkedList.Node-org.apache.commons.collections4.list.AbstractLinkedList.Node-) in class [AbstractLinkedList](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html)<[E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html)> Parameters: nodeToInsert - new node to insert insertBeforeNode - node to insert before Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if either node is null

#### removeNode protected void removeNode([AbstractLinkedList.Node](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.Node.html)<[E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html)> node) Removes the specified node from the list.Overrides: [removeNode](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html#removeNode-org.apache.commons.collections4.list.AbstractLinkedList.Node-) in class [AbstractLinkedList](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html)<[E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html)> Parameters: node - the node to remove Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if node is null

#### removeAllNodes protected void removeAllNodes() Removes all nodes by iteration.Overrides: [removeAllNodes](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html#removeAllNodes--) in class [AbstractLinkedList](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html)<[E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html)>

#### registerCursor protected void registerCursor([CursorableLinkedList.Cursor](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.Cursor.html)<[E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html)> cursor) Registers a cursor to be notified of changes to this list.Parameters: cursor - the cursor to register

#### unregisterCursor protected void unregisterCursor([CursorableLinkedList.Cursor](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.Cursor.html)<[E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html)> cursor) Deregisters a cursor from the list to be notified of changes.Parameters: cursor - the cursor to deregister

#### broadcastNodeChanged protected void broadcastNodeChanged([AbstractLinkedList.Node](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.Node.html)<[E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html)> node) Informs all of my registered cursors that the specified element was changed.Parameters: node - the node that was changed

#### broadcastNodeRemoved protected void broadcastNodeRemoved([AbstractLinkedList.Node](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.Node.html)<[E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html)> node) Informs all of my registered cursors that the specified element was just removed from my list.Parameters: node - the node that was changed

#### broadcastNodeInserted protected void broadcastNodeInserted([AbstractLinkedList.Node](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.Node.html)<[E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html)> node) Informs all of my registered cursors that the specified element was just added to my list.Parameters: node - the node that was changed

#### createSubListListIterator protected [ListIterator](https://docs.oracle.com/javase/7/docs/api/java/util/ListIterator.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html)> createSubListListIterator([AbstractLinkedList.LinkedSubList](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.LinkedSubList.html)<[E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html)> subList, int fromIndex) Creates a list iterator for the sublist.Overrides: [createSubListListIterator](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html#createSubListListIterator-org.apache.commons.collections4.list.AbstractLinkedList.LinkedSubList-int-) in class [AbstractLinkedList](http://docs.google.com/org/apache/commons/collections4/list/AbstractLinkedList.html)<[E](http://docs.google.com/org/apache/commons/collections4/list/CursorableLinkedList.html)> Parameters: subList - the sublist to get an iterator for fromIndex - the index to start from, relative to the sublist Returns: the list iterator for the sublist

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