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org.apache.commons.collections4.set

## Class ListOrderedSet<E>

* [java.lang.Object](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true)
  + [org.apache.commons.collections4.collection.AbstractCollectionDecorator](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html)<E>
    - [org.apache.commons.collections4.set.AbstractSetDecorator](http://docs.google.com/org/apache/commons/collections4/set/AbstractSetDecorator.html)<E>
      * [org.apache.commons.collections4.set.AbstractSerializableSetDecorator](http://docs.google.com/org/apache/commons/collections4/set/AbstractSerializableSetDecorator.html)<E>
        + org.apache.commons.collections4.set.ListOrderedSet<E>
* Type Parameters: E - the type of the elements in this set 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>, [Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<E>  
    
  public class ListOrderedSet<E>  
  extends [AbstractSerializableSetDecorator](http://docs.google.com/org/apache/commons/collections4/set/AbstractSerializableSetDecorator.html)<E>  
  Decorates another Set to ensure that the order of addition is retained and used by the iterator.  
  If an object is added to the set for a second time, it will remain in the original position in the iteration. The order can be observed from the set via the iterator or toArray methods.  
  The ListOrderedSet also has various useful direct methods. These include many from List, such as get(int), remove(int) and indexOf(int). An unmodifiable List view of the set can be obtained via asList().  
  This class cannot implement the List interface directly as various interface methods (notably equals/hashCode) are incompatible with a set.  
  This class is Serializable from Commons Collections 3.1.Since: 3.0 See Also: [Serialized Form](http://docs.google.com/serialized-form.html#org.apache.commons.collections4.set.ListOrderedSet)

### Constructor SummaryConstructors

|  |  |
| --- | --- |
| * + Modifier | * + Constructor and Description |
|  | * + [ListOrderedSet](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html#ListOrderedSet--)() Constructs a new empty ListOrderedSet using a HashSet and an ArrayList internally. |
| * + protected | * + [ListOrderedSet](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html#ListOrderedSet-java.util.Set-)([Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html)> set) Constructor that wraps (not copies). |
| * + protected | * + [ListOrderedSet](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html#ListOrderedSet-java.util.Set-java.util.List-)([Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html)> set, [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/set/ListOrderedSet.html)> list) Constructor that wraps (not copies) the Set and specifies the list to use. |

### Method SummaryAll Methods Static Methods Instance Methods Concrete Methods

|  |  |
| --- | --- |
| * + Modifier and Type | * + Method and Description |
| * + boolean | * + [add](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html#add-E-)([E](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html) object) |
| * + void | * + [add](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html#add-int-E-)(int index, [E](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html) object) Inserts the specified element at the specified position if it is not yet contained in this ordered set (optional operation). |
| * + boolean | * + [addAll](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html#addAll-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/set/ListOrderedSet.html)> coll) |
| * + boolean | * + [addAll](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html#addAll-int-java.util.Collection-)(int index, [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/set/ListOrderedSet.html)> coll) Inserts all elements in the specified collection not yet contained in the ordered set at the specified position (optional operation). |
| * + [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/set/ListOrderedSet.html)> | * + [asList](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html#asList--)() Gets an unmodifiable view of the order of the Set. |
| * + void | * + [clear](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html#clear--)() |
| * + [E](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html) | * + [get](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html#get-int-)(int index) Returns the element at the specified position in this ordered set. |
| * + int | * + [indexOf](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html#indexOf-java.lang.Object-)([Object](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true) object) Returns the index of the first occurrence of the specified element in ordered set. |
| * + [OrderedIterator](http://docs.google.com/org/apache/commons/collections4/OrderedIterator.html)<[E](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html)> | * + [iterator](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html#iterator--)() |
| * + static <E> [ListOrderedSet](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html)<E> | * + [listOrderedSet](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html#listOrderedSet-java.util.List-)([List](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true)<E> list) Factory method to create an ordered set using the supplied list to retain order. |
| * + static <E> [ListOrderedSet](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html)<E> | * + [listOrderedSet](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html#listOrderedSet-java.util.Set-)([Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<E> set) Factory method to create an ordered set. |
| * + static <E> [ListOrderedSet](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html)<E> | * + [listOrderedSet](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html#listOrderedSet-java.util.Set-java.util.List-)([Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<E> set, [List](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true)<E> list) Factory method to create an ordered set specifying the list and set to use. |
| * + [E](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html) | * + [remove](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html#remove-int-)(int index) Removes the element at the specified position from the ordered set. |
| * + boolean | * + [remove](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html#remove-java.lang.Object-)([Object](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true) object) |
| * + boolean | * + [removeAll](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html#removeAll-java.util.Collection-)([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<?> coll) |
| * + boolean | * + [removeIf](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html#removeIf-java.util.function.Predicate-)([Predicate](https://docs.oracle.com/javase/8/docs/api/java/util/function/Predicate.html?is-external=true)<? super [E](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html)> filter) |
| * + boolean | * + [retainAll](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html#retainAll-java.util.Collection-)([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<?> coll) |
| * + [Object](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true)[] | * + [toArray](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html#toArray--)() |
| * + <T> T[] | * + [toArray](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html#toArray-T:A-)(T[] a) |
| * + [String](https://docs.oracle.com/javase/7/docs/api/java/lang/String.html?is-external=true) | * + [toString](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html#toString--)() Uses the underlying List's toString so that order is achieved. |

### Methods inherited from class org.apache.commons.collections4.set.[**AbstractSetDecorator**](http://docs.google.com/org/apache/commons/collections4/set/AbstractSetDecorator.html)[decorated](http://docs.google.com/org/apache/commons/collections4/set/AbstractSetDecorator.html#decorated--), [equals](http://docs.google.com/org/apache/commons/collections4/set/AbstractSetDecorator.html#equals-java.lang.Object-), [hashCode](http://docs.google.com/org/apache/commons/collections4/set/AbstractSetDecorator.html#hashCode--)

### Methods inherited from class org.apache.commons.collections4.collection.[**AbstractCollectionDecorator**](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html)[contains](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html#contains-java.lang.Object-), [containsAll](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html#containsAll-java.util.Collection-), [isEmpty](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html#isEmpty--), [setCollection](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html#setCollection-java.util.Collection-), [size](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html#size--)

### 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.[**Set**](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)[contains](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true#contains-java.lang.Object-), [containsAll](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true#containsAll-java.util.Collection-), [isEmpty](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true#isEmpty--), [size](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true#size--), [spliterator](https://docs.oracle.com/javase/7/docs/api/java/util/Set.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--), [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

#### ListOrderedSet public ListOrderedSet() Constructs a new empty ListOrderedSet using a HashSet and an ArrayList internally.Since: 3.1

#### ListOrderedSet protected ListOrderedSet([Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html)> set) Constructor that wraps (not copies).Parameters: set - the set to decorate, must not be null Throws: [IllegalArgumentException](https://docs.oracle.com/javase/7/docs/api/java/lang/IllegalArgumentException.html?is-external=true) - if set is null

#### ListOrderedSet protected ListOrderedSet([Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html)> set, [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/set/ListOrderedSet.html)> list) Constructor that wraps (not copies) the Set and specifies the list to use. The set and list must both be correctly initialised to the same elements.Parameters: set - the set to decorate, must not be null list - the list to decorate, must not be null Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if set or list is null

### Method Detail

#### listOrderedSet public static <E> [ListOrderedSet](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html)<E> listOrderedSet([Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<E> set, [List](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true)<E> list) Factory method to create an ordered set specifying the list and set to use. The list and set must both be empty.Type Parameters: E - the element type Parameters: set - the set to decorate, must be empty and not null list - the list to decorate, must be empty and not null Returns: a new ordered set Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if set or list is null [IllegalArgumentException](https://docs.oracle.com/javase/7/docs/api/java/lang/IllegalArgumentException.html?is-external=true) - if either the set or list is not empty Since: 4.0

#### listOrderedSet public static <E> [ListOrderedSet](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html)<E> listOrderedSet([Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<E> set) Factory method to create an ordered set. An ArrayList is used to retain order.Type Parameters: E - the element type Parameters: set - the set to decorate, must not be null Returns: a new ordered set Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if set is null Since: 4.0

#### listOrderedSet public static <E> [ListOrderedSet](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html)<E> listOrderedSet([List](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true)<E> list) Factory method to create an ordered set using the supplied list to retain order. A HashSet is used for the set behaviour. NOTE: If the list contains duplicates, the duplicates are removed, altering the specified list.Type Parameters: E - the element type Parameters: list - the list to decorate, must not be null Returns: a new ordered set Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if list is null Since: 4.0

#### asList public [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/set/ListOrderedSet.html)> asList() Gets an unmodifiable view of the order of the Set.Returns: an unmodifiable list view

#### clear public void clear()Specified by: [clear](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true#clear--) 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/set/ListOrderedSet.html)> Specified by: [clear](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true#clear--) in interface [Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html)> Overrides: [clear](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html#clear--) in class [AbstractCollectionDecorator](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html)<[E](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html)>

#### iterator public [OrderedIterator](http://docs.google.com/org/apache/commons/collections4/OrderedIterator.html)<[E](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html)> iterator()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/set/ListOrderedSet.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/set/ListOrderedSet.html)> Specified by: [iterator](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true#iterator--) in interface [Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html)> Overrides: [iterator](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html#iterator--) in class [AbstractCollectionDecorator](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html)<[E](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html)>

#### add public boolean add([E](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html) object)Specified by: [add](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true#add-E-) 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/set/ListOrderedSet.html)> Specified by: [add](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true#add-E-) in interface [Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html)> Overrides: [add](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html#add-E-) in class [AbstractCollectionDecorator](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html)<[E](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html)>

#### addAll public boolean addAll([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/set/ListOrderedSet.html)> coll)Specified by: [addAll](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true#addAll-java.util.Collection-) 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/set/ListOrderedSet.html)> Specified by: [addAll](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true#addAll-java.util.Collection-) in interface [Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html)> Overrides: [addAll](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html#addAll-java.util.Collection-) in class [AbstractCollectionDecorator](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html)<[E](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html)>

#### remove public boolean remove([Object](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true) object)Specified by: [remove](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true#remove-java.lang.Object-) 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/set/ListOrderedSet.html)> Specified by: [remove](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true#remove-java.lang.Object-) in interface [Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html)> Overrides: [remove](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html#remove-java.lang.Object-) in class [AbstractCollectionDecorator](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html)<[E](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html)>

#### removeIf public boolean removeIf([Predicate](https://docs.oracle.com/javase/8/docs/api/java/util/function/Predicate.html?is-external=true)<? super [E](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html)> filter)Specified by: [removeIf](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true#removeIf-java.util.function.Predicate-) 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/set/ListOrderedSet.html)> Overrides: [removeIf](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html#removeIf-java.util.function.Predicate-) in class [AbstractCollectionDecorator](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html)<[E](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html)> Since: 4.4

#### removeAll public boolean removeAll([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<?> coll)Specified by: [removeAll](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true#removeAll-java.util.Collection-) 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/set/ListOrderedSet.html)> Specified by: [removeAll](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true#removeAll-java.util.Collection-) in interface [Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html)> Overrides: [removeAll](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html#removeAll-java.util.Collection-) in class [AbstractCollectionDecorator](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html)<[E](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html)>

#### retainAll public boolean retainAll([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<?> coll) This implementation iterates over the elements of this set, checking each element in turn to see if it's contained in coll. If it's not contained, it's removed from this set. As a consequence, it is advised to use a collection type for coll that provides a fast (e.g. O(1)) implementation of [Collection.contains(Object)](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true#contains-java.lang.Object-).Specified by: [retainAll](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true#retainAll-java.util.Collection-) 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/set/ListOrderedSet.html)> Specified by: [retainAll](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true#retainAll-java.util.Collection-) in interface [Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html)> Overrides: [retainAll](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html#retainAll-java.util.Collection-) in class [AbstractCollectionDecorator](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html)<[E](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html)>

#### toArray public [Object](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true)[] toArray()Specified by: [toArray](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true#toArray--) 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/set/ListOrderedSet.html)> Specified by: [toArray](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true#toArray--) in interface [Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html)> Overrides: [toArray](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html#toArray--) in class [AbstractCollectionDecorator](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html)<[E](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html)>

#### toArray public <T> T[] toArray(T[] a)Specified by: [toArray](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true#toArray-T:A-) 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/set/ListOrderedSet.html)> Specified by: [toArray](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true#toArray-T:A-) in interface [Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html)> Overrides: [toArray](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html#toArray-T:A-) in class [AbstractCollectionDecorator](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html)<[E](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html)>

#### get public [E](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html) get(int index) Returns the element at the specified position in this ordered set.Parameters: index - the position of the element in the ordered [Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true). Returns: the element at position index See Also: [List.get(int)](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true#get-int-)

#### indexOf public int indexOf([Object](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true) object) Returns the index of the first occurrence of the specified element in ordered set.Parameters: object - the element to search for Returns: the index of the first occurrence of the object, or -1 if this ordered set does not contain this object See Also: [List.indexOf(Object)](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true#indexOf-java.lang.Object-)

#### add public void add(int index, [E](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html) object) Inserts the specified element at the specified position if it is not yet contained in this ordered set (optional operation). Shifts the element currently at this position and any subsequent elements to the right.Parameters: index - the index at which the element is to be inserted object - the element to be inserted See Also: [List.add(int, Object)](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true#add-int-E-)

#### addAll public boolean addAll(int index, [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/set/ListOrderedSet.html)> coll) Inserts all elements in the specified collection not yet contained in the ordered set at the specified position (optional operation). Shifts the element currently at the position and all subsequent elements to the right.Parameters: index - the position to insert the elements coll - the collection containing the elements to be inserted Returns: true if this ordered set changed as a result of the call See Also: [List.addAll(int, Collection)](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true#addAll-int-java.util.Collection-)

#### remove public [E](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html) remove(int index) Removes the element at the specified position from the ordered set. Shifts any subsequent elements to the left.Parameters: index - the index of the element to be removed Returns: the element that has been remove from the ordered set See Also: [List.remove(int)](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true#remove-int-)

#### toString public [String](https://docs.oracle.com/javase/7/docs/api/java/lang/String.html?is-external=true) toString() Uses the underlying List's toString so that order is achieved. This means that the decorated Set's toString is not used, so any custom toStrings will be ignored.Overrides: [toString](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html#toString--) in class [AbstractCollectionDecorator](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html)<[E](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html)> Returns: a string representation of the ordered set

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