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org.apache.commons.collections4.set

## Class AbstractSortedSetDecorator<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.AbstractSortedSetDecorator<E>
* Type Parameters: E - the type of the elements in the sorted 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>, [SortedSet](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true)<E> Direct Known Subclasses: [AbstractNavigableSetDecorator](http://docs.google.com/org/apache/commons/collections4/set/AbstractNavigableSetDecorator.html), [UnmodifiableSortedSet](http://docs.google.com/org/apache/commons/collections4/set/UnmodifiableSortedSet.html)  
    
  public abstract class AbstractSortedSetDecorator<E>  
  extends [AbstractSetDecorator](http://docs.google.com/org/apache/commons/collections4/set/AbstractSetDecorator.html)<E>  
  implements [SortedSet](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true)<E>  
  Decorates another SortedSet to provide additional behaviour.  
  Methods are forwarded directly to the decorated set.Since: 3.0 See Also: [Serialized Form](http://docs.google.com/serialized-form.html#org.apache.commons.collections4.set.AbstractSortedSetDecorator)

### Constructor SummaryConstructors

|  |  |
| --- | --- |
| * + Modifier | * + Constructor and Description |
| * + protected | * + [AbstractSortedSetDecorator](http://docs.google.com/org/apache/commons/collections4/set/AbstractSortedSetDecorator.html#AbstractSortedSetDecorator--)() Constructor only used in deserialization, do not use otherwise. |
| * + protected | * + [AbstractSortedSetDecorator](http://docs.google.com/org/apache/commons/collections4/set/AbstractSortedSetDecorator.html#AbstractSortedSetDecorator-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/AbstractSortedSetDecorator.html)> set) Constructor that wraps (not copies). |

### Method SummaryAll Methods Instance Methods Concrete Methods

|  |  |
| --- | --- |
| * + Modifier and Type | * + Method and Description |
| * + [Comparator](https://docs.oracle.com/javase/7/docs/api/java/util/Comparator.html?is-external=true)<? super [E](http://docs.google.com/org/apache/commons/collections4/set/AbstractSortedSetDecorator.html)> | * + [comparator](http://docs.google.com/org/apache/commons/collections4/set/AbstractSortedSetDecorator.html#comparator--)() |
| * + protected [SortedSet](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/set/AbstractSortedSetDecorator.html)> | * + [decorated](http://docs.google.com/org/apache/commons/collections4/set/AbstractSortedSetDecorator.html#decorated--)() Gets the set being decorated. |
| * + [E](http://docs.google.com/org/apache/commons/collections4/set/AbstractSortedSetDecorator.html) | * + [first](http://docs.google.com/org/apache/commons/collections4/set/AbstractSortedSetDecorator.html#first--)() |
| * + [SortedSet](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/set/AbstractSortedSetDecorator.html)> | * + [headSet](http://docs.google.com/org/apache/commons/collections4/set/AbstractSortedSetDecorator.html#headSet-E-)([E](http://docs.google.com/org/apache/commons/collections4/set/AbstractSortedSetDecorator.html) toElement) |
| * + [E](http://docs.google.com/org/apache/commons/collections4/set/AbstractSortedSetDecorator.html) | * + [last](http://docs.google.com/org/apache/commons/collections4/set/AbstractSortedSetDecorator.html#last--)() |
| * + [SortedSet](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/set/AbstractSortedSetDecorator.html)> | * + [subSet](http://docs.google.com/org/apache/commons/collections4/set/AbstractSortedSetDecorator.html#subSet-E-E-)([E](http://docs.google.com/org/apache/commons/collections4/set/AbstractSortedSetDecorator.html) fromElement, [E](http://docs.google.com/org/apache/commons/collections4/set/AbstractSortedSetDecorator.html) toElement) |
| * + [SortedSet](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/set/AbstractSortedSetDecorator.html)> | * + [tailSet](http://docs.google.com/org/apache/commons/collections4/set/AbstractSortedSetDecorator.html#tailSet-E-)([E](http://docs.google.com/org/apache/commons/collections4/set/AbstractSortedSetDecorator.html) fromElement) |

### Methods inherited from class org.apache.commons.collections4.set.[**AbstractSetDecorator**](http://docs.google.com/org/apache/commons/collections4/set/AbstractSetDecorator.html)[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)[add](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html#add-E-), [addAll](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html#addAll-java.util.Collection-), [clear](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html#clear--), [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--), [iterator](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html#iterator--), [remove](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html#remove-java.lang.Object-), [removeAll](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html#removeAll-java.util.Collection-), [removeIf](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html#removeIf-java.util.function.Predicate-), [retainAll](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html#retainAll-java.util.Collection-), [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--), [toArray](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html#toArray--), [toArray](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html#toArray-T:A-), [toString](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.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.[**SortedSet**](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true)[spliterator](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true#spliterator--)

### Methods inherited from interface java.util.[**Set**](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)[add](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true#add-E-), [addAll](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true#addAll-java.util.Collection-), [clear](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true#clear--), [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-), [equals](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true#equals-java.lang.Object-), [hashCode](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true#hashCode--), [isEmpty](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true#isEmpty--), [iterator](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true#iterator--), [remove](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true#remove-java.lang.Object-), [removeAll](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true#removeAll-java.util.Collection-), [retainAll](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true#retainAll-java.util.Collection-), [size](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true#size--), [toArray](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true#toArray--), [toArray](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true#toArray-T:A-)

### 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

#### AbstractSortedSetDecorator protected AbstractSortedSetDecorator() Constructor only used in deserialization, do not use otherwise.Since: 3.1

#### AbstractSortedSetDecorator protected AbstractSortedSetDecorator([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/AbstractSortedSetDecorator.html)> set) Constructor that wraps (not copies).Parameters: set - the set 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 is null

### Method Detail

#### decorated protected [SortedSet](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/set/AbstractSortedSetDecorator.html)> decorated() Gets the set being decorated.Overrides: [decorated](http://docs.google.com/org/apache/commons/collections4/set/AbstractSetDecorator.html#decorated--) in class [AbstractSetDecorator](http://docs.google.com/org/apache/commons/collections4/set/AbstractSetDecorator.html)<[E](http://docs.google.com/org/apache/commons/collections4/set/AbstractSortedSetDecorator.html)> Returns: the decorated set

#### subSet public [SortedSet](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/set/AbstractSortedSetDecorator.html)> subSet([E](http://docs.google.com/org/apache/commons/collections4/set/AbstractSortedSetDecorator.html) fromElement, [E](http://docs.google.com/org/apache/commons/collections4/set/AbstractSortedSetDecorator.html) toElement)Specified by: [subSet](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true#subSet-E-E-) in interface [SortedSet](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/set/AbstractSortedSetDecorator.html)>

#### headSet public [SortedSet](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/set/AbstractSortedSetDecorator.html)> headSet([E](http://docs.google.com/org/apache/commons/collections4/set/AbstractSortedSetDecorator.html) toElement)Specified by: [headSet](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true#headSet-E-) in interface [SortedSet](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/set/AbstractSortedSetDecorator.html)>

#### tailSet public [SortedSet](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/set/AbstractSortedSetDecorator.html)> tailSet([E](http://docs.google.com/org/apache/commons/collections4/set/AbstractSortedSetDecorator.html) fromElement)Specified by: [tailSet](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true#tailSet-E-) in interface [SortedSet](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/set/AbstractSortedSetDecorator.html)>

#### first public [E](http://docs.google.com/org/apache/commons/collections4/set/AbstractSortedSetDecorator.html) first()Specified by: [first](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true#first--) in interface [SortedSet](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/set/AbstractSortedSetDecorator.html)>

#### last public [E](http://docs.google.com/org/apache/commons/collections4/set/AbstractSortedSetDecorator.html) last()Specified by: [last](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true#last--) in interface [SortedSet](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/set/AbstractSortedSetDecorator.html)>

#### comparator public [Comparator](https://docs.oracle.com/javase/7/docs/api/java/util/Comparator.html?is-external=true)<? super [E](http://docs.google.com/org/apache/commons/collections4/set/AbstractSortedSetDecorator.html)> comparator()Specified by: [comparator](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true#comparator--) in interface [SortedSet](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/set/AbstractSortedSetDecorator.html)>

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