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org.apache.commons.collections4.bag

## Class AbstractSortedBagDecorator<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.bag.AbstractBagDecorator](http://docs.google.com/org/apache/commons/collections4/bag/AbstractBagDecorator.html)<E>
      * org.apache.commons.collections4.bag.AbstractSortedBagDecorator<E>
* Type Parameters: E - the type of elements in this bag 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>, [Bag](http://docs.google.com/org/apache/commons/collections4/Bag.html)<E>, [SortedBag](http://docs.google.com/org/apache/commons/collections4/SortedBag.html)<E> Direct Known Subclasses: [CollectionSortedBag](http://docs.google.com/org/apache/commons/collections4/bag/CollectionSortedBag.html), [UnmodifiableSortedBag](http://docs.google.com/org/apache/commons/collections4/bag/UnmodifiableSortedBag.html)  
    
  public abstract class AbstractSortedBagDecorator<E>  
  extends [AbstractBagDecorator](http://docs.google.com/org/apache/commons/collections4/bag/AbstractBagDecorator.html)<E>  
  implements [SortedBag](http://docs.google.com/org/apache/commons/collections4/SortedBag.html)<E>  
  Decorates another SortedBag to provide additional behaviour.  
  Methods are forwarded directly to the decorated bag.Since: 3.0 See Also: [Serialized Form](http://docs.google.com/serialized-form.html#org.apache.commons.collections4.bag.AbstractSortedBagDecorator)

### Constructor SummaryConstructors

|  |  |
| --- | --- |
| * + Modifier | * + Constructor and Description |
| * + protected | * + [AbstractSortedBagDecorator](http://docs.google.com/org/apache/commons/collections4/bag/AbstractSortedBagDecorator.html#AbstractSortedBagDecorator--)() Constructor only used in deserialization, do not use otherwise. |
| * + protected | * + [AbstractSortedBagDecorator](http://docs.google.com/org/apache/commons/collections4/bag/AbstractSortedBagDecorator.html#AbstractSortedBagDecorator-org.apache.commons.collections4.SortedBag-)([SortedBag](http://docs.google.com/org/apache/commons/collections4/SortedBag.html)<[E](http://docs.google.com/org/apache/commons/collections4/bag/AbstractSortedBagDecorator.html)> bag) 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/bag/AbstractSortedBagDecorator.html)> | * + [comparator](http://docs.google.com/org/apache/commons/collections4/bag/AbstractSortedBagDecorator.html#comparator--)() Returns the comparator associated with this sorted set, or null if it uses its elements' natural ordering. |
| * + protected [SortedBag](http://docs.google.com/org/apache/commons/collections4/SortedBag.html)<[E](http://docs.google.com/org/apache/commons/collections4/bag/AbstractSortedBagDecorator.html)> | * + [decorated](http://docs.google.com/org/apache/commons/collections4/bag/AbstractSortedBagDecorator.html#decorated--)() Gets the bag being decorated. |
| * + [E](http://docs.google.com/org/apache/commons/collections4/bag/AbstractSortedBagDecorator.html) | * + [first](http://docs.google.com/org/apache/commons/collections4/bag/AbstractSortedBagDecorator.html#first--)() Returns the first (lowest) member. |
| * + [E](http://docs.google.com/org/apache/commons/collections4/bag/AbstractSortedBagDecorator.html) | * + [last](http://docs.google.com/org/apache/commons/collections4/bag/AbstractSortedBagDecorator.html#last--)() Returns the last (highest) member. |

### Methods inherited from class org.apache.commons.collections4.bag.[**AbstractBagDecorator**](http://docs.google.com/org/apache/commons/collections4/bag/AbstractBagDecorator.html)[add](http://docs.google.com/org/apache/commons/collections4/bag/AbstractBagDecorator.html#add-E-int-), [equals](http://docs.google.com/org/apache/commons/collections4/bag/AbstractBagDecorator.html#equals-java.lang.Object-), [getCount](http://docs.google.com/org/apache/commons/collections4/bag/AbstractBagDecorator.html#getCount-java.lang.Object-), [hashCode](http://docs.google.com/org/apache/commons/collections4/bag/AbstractBagDecorator.html#hashCode--), [remove](http://docs.google.com/org/apache/commons/collections4/bag/AbstractBagDecorator.html#remove-java.lang.Object-int-), [uniqueSet](http://docs.google.com/org/apache/commons/collections4/bag/AbstractBagDecorator.html#uniqueSet--)

### 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 org.apache.commons.collections4.[**Bag**](http://docs.google.com/org/apache/commons/collections4/Bag.html)[add](http://docs.google.com/org/apache/commons/collections4/Bag.html#add-E-), [add](http://docs.google.com/org/apache/commons/collections4/Bag.html#add-E-int-), [containsAll](http://docs.google.com/org/apache/commons/collections4/Bag.html#containsAll-java.util.Collection-), [getCount](http://docs.google.com/org/apache/commons/collections4/Bag.html#getCount-java.lang.Object-), [iterator](http://docs.google.com/org/apache/commons/collections4/Bag.html#iterator--), [remove](http://docs.google.com/org/apache/commons/collections4/Bag.html#remove-java.lang.Object-), [remove](http://docs.google.com/org/apache/commons/collections4/Bag.html#remove-java.lang.Object-int-), [removeAll](http://docs.google.com/org/apache/commons/collections4/Bag.html#removeAll-java.util.Collection-), [retainAll](http://docs.google.com/org/apache/commons/collections4/Bag.html#retainAll-java.util.Collection-), [size](http://docs.google.com/org/apache/commons/collections4/Bag.html#size--), [uniqueSet](http://docs.google.com/org/apache/commons/collections4/Bag.html#uniqueSet--)

### Methods inherited from interface java.util.[**Collection**](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)[addAll](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true#addAll-java.util.Collection-), [clear](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true#clear--), [contains](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true#contains-java.lang.Object-), [equals](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true#equals-java.lang.Object-), [hashCode](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true#hashCode--), [isEmpty](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true#isEmpty--), [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-), [spliterator](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true#spliterator--), [stream](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true#stream--), [toArray](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true#toArray--), [toArray](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true#toArray-T:A-)

### 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

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

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

### Method Detail

#### decorated protected [SortedBag](http://docs.google.com/org/apache/commons/collections4/SortedBag.html)<[E](http://docs.google.com/org/apache/commons/collections4/bag/AbstractSortedBagDecorator.html)> decorated() Gets the bag being decorated.Overrides: [decorated](http://docs.google.com/org/apache/commons/collections4/bag/AbstractBagDecorator.html#decorated--) in class [AbstractBagDecorator](http://docs.google.com/org/apache/commons/collections4/bag/AbstractBagDecorator.html)<[E](http://docs.google.com/org/apache/commons/collections4/bag/AbstractSortedBagDecorator.html)> Returns: the decorated bag

#### first public [E](http://docs.google.com/org/apache/commons/collections4/bag/AbstractSortedBagDecorator.html) first() Description copied from interface: [SortedBag](http://docs.google.com/org/apache/commons/collections4/SortedBag.html#first--) Returns the first (lowest) member.Specified by: [first](http://docs.google.com/org/apache/commons/collections4/SortedBag.html#first--) in interface [SortedBag](http://docs.google.com/org/apache/commons/collections4/SortedBag.html)<[E](http://docs.google.com/org/apache/commons/collections4/bag/AbstractSortedBagDecorator.html)> Returns: the first element in the sorted bag

#### last public [E](http://docs.google.com/org/apache/commons/collections4/bag/AbstractSortedBagDecorator.html) last() Description copied from interface: [SortedBag](http://docs.google.com/org/apache/commons/collections4/SortedBag.html#last--) Returns the last (highest) member.Specified by: [last](http://docs.google.com/org/apache/commons/collections4/SortedBag.html#last--) in interface [SortedBag](http://docs.google.com/org/apache/commons/collections4/SortedBag.html)<[E](http://docs.google.com/org/apache/commons/collections4/bag/AbstractSortedBagDecorator.html)> Returns: the last element in the sorted bag

#### 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/bag/AbstractSortedBagDecorator.html)> comparator() Description copied from interface: [SortedBag](http://docs.google.com/org/apache/commons/collections4/SortedBag.html#comparator--) Returns the comparator associated with this sorted set, or null if it uses its elements' natural ordering.Specified by: [comparator](http://docs.google.com/org/apache/commons/collections4/SortedBag.html#comparator--) in interface [SortedBag](http://docs.google.com/org/apache/commons/collections4/SortedBag.html)<[E](http://docs.google.com/org/apache/commons/collections4/bag/AbstractSortedBagDecorator.html)> Returns: the comparator in use, or null if natural ordering

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