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org.apache.commons.collections4.bag

## Class SynchronizedSortedBag<E>

* [java.lang.Object](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true)
  + [org.apache.commons.collections4.collection.SynchronizedCollection](http://docs.google.com/org/apache/commons/collections4/collection/SynchronizedCollection.html)<E>
    - [org.apache.commons.collections4.bag.SynchronizedBag](http://docs.google.com/org/apache/commons/collections4/bag/SynchronizedBag.html)<E>
      * org.apache.commons.collections4.bag.SynchronizedSortedBag<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>  
    
  public class SynchronizedSortedBag<E>  
  extends [SynchronizedBag](http://docs.google.com/org/apache/commons/collections4/bag/SynchronizedBag.html)<E>  
  implements [SortedBag](http://docs.google.com/org/apache/commons/collections4/SortedBag.html)<E>  
  Decorates another [SortedBag](http://docs.google.com/org/apache/commons/collections4/SortedBag.html) to synchronize its behaviour for a multi-threaded environment.  
  Methods are synchronized, then forwarded to the decorated bag. Iterators must be separately synchronized around the loop.  
  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.bag.SynchronizedSortedBag)

### Field Summary

### Fields inherited from class org.apache.commons.collections4.collection.[**SynchronizedCollection**](http://docs.google.com/org/apache/commons/collections4/collection/SynchronizedCollection.html)[lock](http://docs.google.com/org/apache/commons/collections4/collection/SynchronizedCollection.html#lock)

### Constructor SummaryConstructors

|  |  |
| --- | --- |
| * + Modifier | * + Constructor and Description |
| * + protected | * + [SynchronizedSortedBag](http://docs.google.com/org/apache/commons/collections4/bag/SynchronizedSortedBag.html#SynchronizedSortedBag-org.apache.commons.collections4.Bag-java.lang.Object-)([Bag](http://docs.google.com/org/apache/commons/collections4/Bag.html)<[E](http://docs.google.com/org/apache/commons/collections4/bag/SynchronizedSortedBag.html)> bag, [Object](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true) lock) Constructor that wraps (not copies). |
| * + protected | * + [SynchronizedSortedBag](http://docs.google.com/org/apache/commons/collections4/bag/SynchronizedSortedBag.html#SynchronizedSortedBag-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/SynchronizedSortedBag.html)> bag) Constructor that wraps (not copies). |

### Method SummaryAll Methods Static 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/SynchronizedSortedBag.html)> | * + [comparator](http://docs.google.com/org/apache/commons/collections4/bag/SynchronizedSortedBag.html#comparator--)() Returns the comparator associated with this sorted set, or null if it uses its elements' natural ordering. |
| * + [E](http://docs.google.com/org/apache/commons/collections4/bag/SynchronizedSortedBag.html) | * + [first](http://docs.google.com/org/apache/commons/collections4/bag/SynchronizedSortedBag.html#first--)() Returns the first (lowest) member. |
| * + protected [SortedBag](http://docs.google.com/org/apache/commons/collections4/SortedBag.html)<[E](http://docs.google.com/org/apache/commons/collections4/bag/SynchronizedSortedBag.html)> | * + [getSortedBag](http://docs.google.com/org/apache/commons/collections4/bag/SynchronizedSortedBag.html#getSortedBag--)() Gets the bag being decorated. |
| * + [E](http://docs.google.com/org/apache/commons/collections4/bag/SynchronizedSortedBag.html) | * + [last](http://docs.google.com/org/apache/commons/collections4/bag/SynchronizedSortedBag.html#last--)() Returns the last (highest) member. |
| * + static <E> [SynchronizedSortedBag](http://docs.google.com/org/apache/commons/collections4/bag/SynchronizedSortedBag.html)<E> | * + [synchronizedSortedBag](http://docs.google.com/org/apache/commons/collections4/bag/SynchronizedSortedBag.html#synchronizedSortedBag-org.apache.commons.collections4.SortedBag-)([SortedBag](http://docs.google.com/org/apache/commons/collections4/SortedBag.html)<E> bag) Factory method to create a synchronized sorted bag. |

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

### Methods inherited from class org.apache.commons.collections4.collection.[**SynchronizedCollection**](http://docs.google.com/org/apache/commons/collections4/collection/SynchronizedCollection.html)[add](http://docs.google.com/org/apache/commons/collections4/collection/SynchronizedCollection.html#add-E-), [addAll](http://docs.google.com/org/apache/commons/collections4/collection/SynchronizedCollection.html#addAll-java.util.Collection-), [clear](http://docs.google.com/org/apache/commons/collections4/collection/SynchronizedCollection.html#clear--), [contains](http://docs.google.com/org/apache/commons/collections4/collection/SynchronizedCollection.html#contains-java.lang.Object-), [containsAll](http://docs.google.com/org/apache/commons/collections4/collection/SynchronizedCollection.html#containsAll-java.util.Collection-), [decorated](http://docs.google.com/org/apache/commons/collections4/collection/SynchronizedCollection.html#decorated--), [isEmpty](http://docs.google.com/org/apache/commons/collections4/collection/SynchronizedCollection.html#isEmpty--), [iterator](http://docs.google.com/org/apache/commons/collections4/collection/SynchronizedCollection.html#iterator--), [remove](http://docs.google.com/org/apache/commons/collections4/collection/SynchronizedCollection.html#remove-java.lang.Object-), [removeAll](http://docs.google.com/org/apache/commons/collections4/collection/SynchronizedCollection.html#removeAll-java.util.Collection-), [removeIf](http://docs.google.com/org/apache/commons/collections4/collection/SynchronizedCollection.html#removeIf-java.util.function.Predicate-), [retainAll](http://docs.google.com/org/apache/commons/collections4/collection/SynchronizedCollection.html#retainAll-java.util.Collection-), [size](http://docs.google.com/org/apache/commons/collections4/collection/SynchronizedCollection.html#size--), [synchronizedCollection](http://docs.google.com/org/apache/commons/collections4/collection/SynchronizedCollection.html#synchronizedCollection-java.util.Collection-), [toArray](http://docs.google.com/org/apache/commons/collections4/collection/SynchronizedCollection.html#toArray--), [toArray](http://docs.google.com/org/apache/commons/collections4/collection/SynchronizedCollection.html#toArray-T:A-), [toString](http://docs.google.com/org/apache/commons/collections4/collection/SynchronizedCollection.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

#### SynchronizedSortedBag protected SynchronizedSortedBag([SortedBag](http://docs.google.com/org/apache/commons/collections4/SortedBag.html)<[E](http://docs.google.com/org/apache/commons/collections4/bag/SynchronizedSortedBag.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

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

### Method Detail

#### synchronizedSortedBag public static <E> [SynchronizedSortedBag](http://docs.google.com/org/apache/commons/collections4/bag/SynchronizedSortedBag.html)<E> synchronizedSortedBag([SortedBag](http://docs.google.com/org/apache/commons/collections4/SortedBag.html)<E> bag) Factory method to create a synchronized sorted bag.Type Parameters: E - the type of the elements in the bag Parameters: bag - the bag to decorate, must not be null Returns: a new synchronized SortedBag Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if bag is null Since: 4.0

#### getSortedBag protected [SortedBag](http://docs.google.com/org/apache/commons/collections4/SortedBag.html)<[E](http://docs.google.com/org/apache/commons/collections4/bag/SynchronizedSortedBag.html)> getSortedBag() Gets the bag being decorated.Returns: the decorated bag

#### first public [E](http://docs.google.com/org/apache/commons/collections4/bag/SynchronizedSortedBag.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/SynchronizedSortedBag.html)> Returns: the first element in the sorted bag

#### last public [E](http://docs.google.com/org/apache/commons/collections4/bag/SynchronizedSortedBag.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/SynchronizedSortedBag.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/SynchronizedSortedBag.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/SynchronizedSortedBag.html)> Returns: the comparator in use, or null if natural ordering

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