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org.apache.commons.collections4

## Class SetUtils

* [java.lang.Object](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true)
  + org.apache.commons.collections4.SetUtils
* public class SetUtils  
  extends [Object](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true)  
  Provides utility methods and decorators for [Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true) and [SortedSet](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true) instances.Since: 2.1

### Nested Class SummaryNested Classes

|  |  |
| --- | --- |
| * + Modifier and Type | * + Class and Description |
| * + static class | * + [SetUtils.SetView](http://docs.google.com/org/apache/commons/collections4/SetUtils.SetView.html)<[E](http://docs.google.com/org/apache/commons/collections4/SetUtils.SetView.html)> An unmodifiable **view** of a set that may be backed by other sets. |

### Field SummaryFields

|  |  |
| --- | --- |
| * + Modifier and Type | * + Field and Description |
| * + static [SortedSet](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true) | * + [EMPTY\_SORTED\_SET](http://docs.google.com/org/apache/commons/collections4/SetUtils.html#EMPTY_SORTED_SET) An empty unmodifiable sorted set. |

### Method SummaryAll Methods Static Methods Concrete Methods

|  |  |
| --- | --- |
| * + Modifier and Type | * + Method and Description |
| * + static <E> [SetUtils.SetView](http://docs.google.com/org/apache/commons/collections4/SetUtils.SetView.html)<E> | * + [difference](http://docs.google.com/org/apache/commons/collections4/SetUtils.html#difference-java.util.Set-java.util.Set-)([Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<? extends E> a, [Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<? extends E> b) Returns a unmodifiable **view** containing the difference of the given [Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)s, denoted by a \ b (or a - b). |
| * + static <E> [SetUtils.SetView](http://docs.google.com/org/apache/commons/collections4/SetUtils.SetView.html)<E> | * + [disjunction](http://docs.google.com/org/apache/commons/collections4/SetUtils.html#disjunction-java.util.Set-java.util.Set-)([Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<? extends E> a, [Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<? extends E> b) Returns a unmodifiable **view** of the symmetric difference of the given [Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)s. |
| * + static <T> [Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<T> | * + [emptyIfNull](http://docs.google.com/org/apache/commons/collections4/SetUtils.html#emptyIfNull-java.util.Set-)([Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<T> set) Returns an immutable empty set if the argument is null, or the argument itself otherwise. |
| * + static <E> [Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<E> | * + [emptySet](http://docs.google.com/org/apache/commons/collections4/SetUtils.html#emptySet--)() Get a typed empty unmodifiable Set. |
| * + static <E> [SortedSet](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true)<E> | * + [emptySortedSet](http://docs.google.com/org/apache/commons/collections4/SetUtils.html#emptySortedSet--)() Get a typed empty unmodifiable sorted set. |
| * + static <T> int | * + [hashCodeForSet](http://docs.google.com/org/apache/commons/collections4/SetUtils.html#hashCodeForSet-java.util.Collection-)([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<T> set) Generates a hash code using the algorithm specified in [Set.hashCode()](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true#hashCode--). |
| * + static <E> [HashSet](https://docs.oracle.com/javase/7/docs/api/java/util/HashSet.html?is-external=true)<E> | * + [hashSet](http://docs.google.com/org/apache/commons/collections4/SetUtils.html#hashSet-E...-)(E... items) Creates a set from the given items. |
| * + static <E> [SetUtils.SetView](http://docs.google.com/org/apache/commons/collections4/SetUtils.SetView.html)<E> | * + [intersection](http://docs.google.com/org/apache/commons/collections4/SetUtils.html#intersection-java.util.Set-java.util.Set-)([Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<? extends E> a, [Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<? extends E> b) Returns a unmodifiable **view** of the intersection of the given [Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)s. |
| * + static boolean | * + [isEqualSet](http://docs.google.com/org/apache/commons/collections4/SetUtils.html#isEqualSet-java.util.Collection-java.util.Collection-)([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<?> set1, [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<?> set2) Tests two sets for equality as per the equals() contract in [Set.equals(java.lang.Object)](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true#equals-java.lang.Object-). |
| * + static <E> [Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<E> | * + [newIdentityHashSet](http://docs.google.com/org/apache/commons/collections4/SetUtils.html#newIdentityHashSet--)() Returns a new hash set that matches elements based on == not equals(). |
| * + static <E> [Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<E> | * + [orderedSet](http://docs.google.com/org/apache/commons/collections4/SetUtils.html#orderedSet-java.util.Set-)([Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<E> set) Returns a set that maintains the order of elements that are added backed by the given set. |
| * + static <E> [SortedSet](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true)<E> | * + [predicatedNavigableSet](http://docs.google.com/org/apache/commons/collections4/SetUtils.html#predicatedNavigableSet-java.util.NavigableSet-org.apache.commons.collections4.Predicate-)([NavigableSet](https://docs.oracle.com/javase/7/docs/api/java/util/NavigableSet.html?is-external=true)<E> set, [Predicate](http://docs.google.com/org/apache/commons/collections4/Predicate.html)<? super E> predicate) Returns a predicated (validating) navigable set backed by the given navigable set. |
| * + static <E> [Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<E> | * + [predicatedSet](http://docs.google.com/org/apache/commons/collections4/SetUtils.html#predicatedSet-java.util.Set-org.apache.commons.collections4.Predicate-)([Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<E> set, [Predicate](http://docs.google.com/org/apache/commons/collections4/Predicate.html)<? super E> predicate) Returns a predicated (validating) set backed by the given set. |
| * + static <E> [SortedSet](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true)<E> | * + [predicatedSortedSet](http://docs.google.com/org/apache/commons/collections4/SetUtils.html#predicatedSortedSet-java.util.SortedSet-org.apache.commons.collections4.Predicate-)([SortedSet](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true)<E> set, [Predicate](http://docs.google.com/org/apache/commons/collections4/Predicate.html)<? super E> predicate) Returns a predicated (validating) sorted set backed by the given sorted set. |
| * + static <E> [Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<E> | * + [synchronizedSet](http://docs.google.com/org/apache/commons/collections4/SetUtils.html#synchronizedSet-java.util.Set-)([Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<E> set) Returns a synchronized set backed by the given set. |
| * + static <E> [SortedSet](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true)<E> | * + [synchronizedSortedSet](http://docs.google.com/org/apache/commons/collections4/SetUtils.html#synchronizedSortedSet-java.util.SortedSet-)([SortedSet](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true)<E> set) Returns a synchronized sorted set backed by the given sorted set. |
| * + static <E> [SortedSet](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true)<E> | * + [transformedNavigableSet](http://docs.google.com/org/apache/commons/collections4/SetUtils.html#transformedNavigableSet-java.util.NavigableSet-org.apache.commons.collections4.Transformer-)([NavigableSet](https://docs.oracle.com/javase/7/docs/api/java/util/NavigableSet.html?is-external=true)<E> set, [Transformer](http://docs.google.com/org/apache/commons/collections4/Transformer.html)<? super E,? extends E> transformer) Returns a transformed navigable set backed by the given navigable set. |
| * + static <E> [Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<E> | * + [transformedSet](http://docs.google.com/org/apache/commons/collections4/SetUtils.html#transformedSet-java.util.Set-org.apache.commons.collections4.Transformer-)([Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<E> set, [Transformer](http://docs.google.com/org/apache/commons/collections4/Transformer.html)<? super E,? extends E> transformer) Returns a transformed set backed by the given set. |
| * + static <E> [SortedSet](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true)<E> | * + [transformedSortedSet](http://docs.google.com/org/apache/commons/collections4/SetUtils.html#transformedSortedSet-java.util.SortedSet-org.apache.commons.collections4.Transformer-)([SortedSet](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true)<E> set, [Transformer](http://docs.google.com/org/apache/commons/collections4/Transformer.html)<? super E,? extends E> transformer) Returns a transformed sorted set backed by the given set. |
| * + static <E> [SetUtils.SetView](http://docs.google.com/org/apache/commons/collections4/SetUtils.SetView.html)<E> | * + [union](http://docs.google.com/org/apache/commons/collections4/SetUtils.html#union-java.util.Set-java.util.Set-)([Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<? extends E> a, [Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<? extends E> b) Returns a unmodifiable **view** of the union of the given [Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)s. |
| * + static <E> [SortedSet](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true)<E> | * + [unmodifiableNavigableSet](http://docs.google.com/org/apache/commons/collections4/SetUtils.html#unmodifiableNavigableSet-java.util.NavigableSet-)([NavigableSet](https://docs.oracle.com/javase/7/docs/api/java/util/NavigableSet.html?is-external=true)<E> set) Returns an unmodifiable navigable set backed by the given navigable set. |
| * + static <E> [Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<E> | * + [unmodifiableSet](http://docs.google.com/org/apache/commons/collections4/SetUtils.html#unmodifiableSet-E...-)(E... items) Creates an unmodifiable set from the given items. |
| * + static <E> [Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<E> | * + [unmodifiableSet](http://docs.google.com/org/apache/commons/collections4/SetUtils.html#unmodifiableSet-java.util.Set-)([Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<? extends E> set) Returns an unmodifiable set backed by the given set. |
| * + static <E> [SortedSet](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true)<E> | * + [unmodifiableSortedSet](http://docs.google.com/org/apache/commons/collections4/SetUtils.html#unmodifiableSortedSet-java.util.SortedSet-)([SortedSet](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true)<E> set) Returns an unmodifiable sorted set backed by the given sorted set. |

### 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--), [equals](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true#equals-java.lang.Object-), [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--), [hashCode](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true#hashCode--), [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--), [toString](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true#toString--), [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-)

### Field Detail

#### EMPTY\_SORTED\_SET public static final [SortedSet](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true) EMPTY\_SORTED\_SET An empty unmodifiable sorted set. This is not provided in the JDK.

### Method Detail

#### difference public static <E> [SetUtils.SetView](http://docs.google.com/org/apache/commons/collections4/SetUtils.SetView.html)<E> difference([Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<? extends E> a, [Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<? extends E> b) Returns a unmodifiable **view** containing the difference of the given [Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)s, denoted by a \ b (or a - b). The returned view contains all elements of a that are not a member of b.Type Parameters: E - the generic type that is able to represent the types contained in both input sets. Parameters: a - the set to subtract from, must not be null b - the set to subtract, must not be null Returns: a view of the relative complement of of the two sets Since: 4.1

#### disjunction public static <E> [SetUtils.SetView](http://docs.google.com/org/apache/commons/collections4/SetUtils.SetView.html)<E> disjunction([Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<? extends E> a, [Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<? extends E> b) Returns a unmodifiable **view** of the symmetric difference of the given [Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)s. The returned view contains all elements of a and b that are not a member of the other set. This is equivalent to union(difference(a, b), difference(b, a)).Type Parameters: E - the generic type that is able to represent the types contained in both input sets. Parameters: a - the first set, must not be null b - the second set, must not be null Returns: a view of the symmetric difference of the two sets Since: 4.1

#### emptyIfNull public static <T> [Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<T> emptyIfNull([Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<T> set) Returns an immutable empty set if the argument is null, or the argument itself otherwise.Type Parameters: T - the element type Parameters: set - the set, possibly null Returns: an empty set if the argument is null

#### emptySet public static <E> [Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<E> emptySet() Get a typed empty unmodifiable Set.Type Parameters: E - the element type Returns: an empty Set

#### emptySortedSet public static <E> [SortedSet](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true)<E> emptySortedSet() Get a typed empty unmodifiable sorted set.Type Parameters: E - the element type Returns: an empty sorted Set

#### hashCodeForSet public static <T> int hashCodeForSet([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<T> set) Generates a hash code using the algorithm specified in [Set.hashCode()](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true#hashCode--). This method is useful for implementing Set when you cannot extend AbstractSet. The method takes Collection instances to enable other collection types to use the Set implementation algorithm.Type Parameters: T - the element type Parameters: set - the set to calculate the hash code for, may be null Returns: the hash code See Also: [Set.hashCode()](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true#hashCode--)

#### hashSet public static <E> [HashSet](https://docs.oracle.com/javase/7/docs/api/java/util/HashSet.html?is-external=true)<E> hashSet(E... items) Creates a set from the given items. If the passed var-args argument is null, then the method returns null.Type Parameters: E - the element type Parameters: items - the elements that make up the new set Returns: a set Since: 4.3

#### intersection public static <E> [SetUtils.SetView](http://docs.google.com/org/apache/commons/collections4/SetUtils.SetView.html)<E> intersection([Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<? extends E> a, [Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<? extends E> b) Returns a unmodifiable **view** of the intersection of the given [Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)s. The returned view contains all elements that are members of both input sets (a and b).Type Parameters: E - the generic type that is able to represent the types contained in both input sets. Parameters: a - the first set, must not be null b - the second set, must not be null Returns: a view of the intersection of the two sets Since: 4.1

#### isEqualSet public static boolean isEqualSet([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<?> set1, [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<?> set2) Tests two sets for equality as per the equals() contract in [Set.equals(java.lang.Object)](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true#equals-java.lang.Object-). This method is useful for implementing Set when you cannot extend AbstractSet. The method takes Collection instances to enable other collection types to use the Set implementation algorithm. The relevant text (slightly paraphrased as this is a static method) is:Two sets are considered equal if they have the same size, and every member of the first set is contained in the second. This ensures that the equals method works properly across different implementations of the Set interface. This implementation first checks if the two sets are the same object: if so it returns true. Then, it checks if the two sets are identical in size; if not, it returns false. If so, it returns a.containsAll((Collection) b).Parameters: set1 - the first set, may be null set2 - the second set, may be null Returns: whether the sets are equal by value comparison See Also: [Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)

#### newIdentityHashSet public static <E> [Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<E> newIdentityHashSet() Returns a new hash set that matches elements based on == not equals(). **This set will violate the detail of various Set contracts.** As a general rule, don't compare this set to other sets. In particular, you can't use decorators like [ListOrderedSet](http://docs.google.com/org/apache/commons/collections4/set/ListOrderedSet.html) on it, which silently assume that these contracts are fulfilled. **Note that the returned set is not synchronized and is not thread-safe.** If you wish to use this set from multiple threads concurrently, you must use appropriate synchronization. The simplest approach is to wrap this map using [Collections.synchronizedSet(Set)](https://docs.oracle.com/javase/7/docs/api/java/util/Collections.html?is-external=true#synchronizedSet-java.util.Set-). This class may throw exceptions when accessed by concurrent threads without synchronization.Type Parameters: E - the element type Returns: a new identity hash set Since: 4.1

#### orderedSet public static <E> [Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<E> orderedSet([Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<E> set) Returns a set that maintains the order of elements that are added backed by the given set. If an element is added twice, the order is determined by the first add. The order is observed through the iterator or toArray.Type Parameters: E - the element type Parameters: set - the set to order, must not be null Returns: an ordered set backed by the given set Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if the set is null

#### predicatedNavigableSet public static <E> [SortedSet](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true)<E> predicatedNavigableSet([NavigableSet](https://docs.oracle.com/javase/7/docs/api/java/util/NavigableSet.html?is-external=true)<E> set, [Predicate](http://docs.google.com/org/apache/commons/collections4/Predicate.html)<? super E> predicate) Returns a predicated (validating) navigable set backed by the given navigable set. Only objects that pass the test in the given predicate can be added to the set. Trying to add an invalid object results in an IllegalArgumentException. It is important not to use the original set after invoking this method, as it is a backdoor for adding invalid objects.Type Parameters: E - the element type Parameters: set - the navigable set to predicate, must not be null predicate - the predicate for the navigable set, must not be null Returns: a predicated navigable set backed by the given navigable set Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if the set or predicate is null Since: 4.1

#### predicatedSet public static <E> [Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<E> predicatedSet([Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<E> set, [Predicate](http://docs.google.com/org/apache/commons/collections4/Predicate.html)<? super E> predicate) Returns a predicated (validating) set backed by the given set. Only objects that pass the test in the given predicate can be added to the set. Trying to add an invalid object results in an IllegalArgumentException. It is important not to use the original set after invoking this method, as it is a backdoor for adding invalid objects.Type Parameters: E - the element type Parameters: set - the set to predicate, must not be null predicate - the predicate for the set, must not be null Returns: a predicated set backed by the given set Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if the set or predicate is null

#### predicatedSortedSet public static <E> [SortedSet](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true)<E> predicatedSortedSet([SortedSet](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true)<E> set, [Predicate](http://docs.google.com/org/apache/commons/collections4/Predicate.html)<? super E> predicate) Returns a predicated (validating) sorted set backed by the given sorted set. Only objects that pass the test in the given predicate can be added to the set. Trying to add an invalid object results in an IllegalArgumentException. It is important not to use the original set after invoking this method, as it is a backdoor for adding invalid objects.Type Parameters: E - the element type Parameters: set - the sorted set to predicate, must not be null predicate - the predicate for the sorted set, must not be null Returns: a predicated sorted set backed by the given sorted set Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if the set or predicate is null

#### synchronizedSet public static <E> [Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<E> synchronizedSet([Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<E> set) Returns a synchronized set backed by the given set. You must manually synchronize on the returned set's iterator to avoid non-deterministic behavior: Set s = SetUtils.synchronizedSet(mySet); synchronized (s) { Iterator i = s.iterator(); while (i.hasNext()) { process (i.next()); } } This method is just a wrapper for [Collections.synchronizedSet(Set)](https://docs.oracle.com/javase/7/docs/api/java/util/Collections.html?is-external=true#synchronizedSet-java.util.Set-).Type Parameters: E - the element type Parameters: set - the set to synchronize, must not be null Returns: a synchronized set backed by the given set Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if the set is null

#### synchronizedSortedSet public static <E> [SortedSet](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true)<E> synchronizedSortedSet([SortedSet](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true)<E> set) Returns a synchronized sorted set backed by the given sorted set. You must manually synchronize on the returned set's iterator to avoid non-deterministic behavior: Set s = SetUtils.synchronizedSortedSet(mySet); synchronized (s) { Iterator i = s.iterator(); while (i.hasNext()) { process (i.next()); } } This method is just a wrapper for [Collections.synchronizedSortedSet(SortedSet)](https://docs.oracle.com/javase/7/docs/api/java/util/Collections.html?is-external=true#synchronizedSortedSet-java.util.SortedSet-).Type Parameters: E - the element type Parameters: set - the sorted set to synchronize, must not be null Returns: a synchronized set backed by the given set Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if the set is null

#### transformedNavigableSet public static <E> [SortedSet](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true)<E> transformedNavigableSet([NavigableSet](https://docs.oracle.com/javase/7/docs/api/java/util/NavigableSet.html?is-external=true)<E> set, [Transformer](http://docs.google.com/org/apache/commons/collections4/Transformer.html)<? super E,? extends E> transformer) Returns a transformed navigable set backed by the given navigable set. Each object is passed through the transformer as it is added to the Set. It is important not to use the original set after invoking this method, as it is a backdoor for adding untransformed objects. Existing entries in the specified set will not be transformed. If you want that behaviour, see [TransformedNavigableSet.transformedNavigableSet(java.util.NavigableSet<E>, org.apache.commons.collections4.Transformer<? super E, ? extends E>)](http://docs.google.com/org/apache/commons/collections4/set/TransformedNavigableSet.html#transformedNavigableSet-java.util.NavigableSet-org.apache.commons.collections4.Transformer-).Type Parameters: E - the element type Parameters: set - the navigable set to transform, must not be null transformer - the transformer for the set, must not be null Returns: a transformed set backed by the given set Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if the set or transformer is null Since: 4.1

#### transformedSet public static <E> [Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<E> transformedSet([Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<E> set, [Transformer](http://docs.google.com/org/apache/commons/collections4/Transformer.html)<? super E,? extends E> transformer) Returns a transformed set backed by the given set. Each object is passed through the transformer as it is added to the Set. It is important not to use the original set after invoking this method, as it is a backdoor for adding untransformed objects. Existing entries in the specified set will not be transformed. If you want that behaviour, see [TransformedSet.transformedSet(java.util.Set<E>, org.apache.commons.collections4.Transformer<? super E, ? extends E>)](http://docs.google.com/org/apache/commons/collections4/set/TransformedSet.html#transformedSet-java.util.Set-org.apache.commons.collections4.Transformer-).Type Parameters: E - the element type Parameters: set - the set to transform, must not be null transformer - the transformer for the set, must not be null Returns: a transformed set backed by the given set Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if the set or transformer is null

#### transformedSortedSet public static <E> [SortedSet](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true)<E> transformedSortedSet([SortedSet](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true)<E> set, [Transformer](http://docs.google.com/org/apache/commons/collections4/Transformer.html)<? super E,? extends E> transformer) Returns a transformed sorted set backed by the given set. Each object is passed through the transformer as it is added to the Set. It is important not to use the original set after invoking this method, as it is a backdoor for adding untransformed objects. Existing entries in the specified set will not be transformed. If you want that behaviour, see [TransformedSortedSet.transformedSortedSet(java.util.SortedSet<E>, org.apache.commons.collections4.Transformer<? super E, ? extends E>)](http://docs.google.com/org/apache/commons/collections4/set/TransformedSortedSet.html#transformedSortedSet-java.util.SortedSet-org.apache.commons.collections4.Transformer-).Type Parameters: E - the element type Parameters: set - the set to transform, must not be null transformer - the transformer for the set, must not be null Returns: a transformed set backed by the given set Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if the set or transformer is null

#### union public static <E> [SetUtils.SetView](http://docs.google.com/org/apache/commons/collections4/SetUtils.SetView.html)<E> union([Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<? extends E> a, [Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<? extends E> b) Returns a unmodifiable **view** of the union of the given [Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)s. The returned view contains all elements of a and b.Type Parameters: E - the generic type that is able to represent the types contained in both input sets. Parameters: a - the first set, must not be null b - the second set, must not be null Returns: a view of the union of the two set Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if either input set is null Since: 4.1

#### unmodifiableNavigableSet public static <E> [SortedSet](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true)<E> unmodifiableNavigableSet([NavigableSet](https://docs.oracle.com/javase/7/docs/api/java/util/NavigableSet.html?is-external=true)<E> set) Returns an unmodifiable navigable set backed by the given navigable set. This method uses the implementation in the decorators subpackage.Type Parameters: E - the element type Parameters: set - the navigable set to make unmodifiable, must not be null Returns: an unmodifiable set backed by the given set Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if the set is null Since: 4.1

#### unmodifiableSet public static <E> [Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<E> unmodifiableSet(E... items) Creates an unmodifiable set from the given items. If the passed var-args argument is null, then the method returns null.Type Parameters: E - the element type Parameters: items - the elements that make up the new set Returns: a set Since: 4.3

#### unmodifiableSet public static <E> [Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<E> unmodifiableSet([Set](https://docs.oracle.com/javase/7/docs/api/java/util/Set.html?is-external=true)<? extends E> set) Returns an unmodifiable set backed by the given set. This method uses the implementation in the decorators subpackage.Type Parameters: E - the element type Parameters: set - the set to make unmodifiable, must not be null Returns: an unmodifiable set backed by the given set Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if the set is null

#### unmodifiableSortedSet public static <E> [SortedSet](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true)<E> unmodifiableSortedSet([SortedSet](https://docs.oracle.com/javase/7/docs/api/java/util/SortedSet.html?is-external=true)<E> set) Returns an unmodifiable sorted set backed by the given sorted set. This method uses the implementation in the decorators subpackage.Type Parameters: E - the element type Parameters: set - the sorted set to make unmodifiable, must not be null Returns: an unmodifiable set backed by the given set Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if the set is null

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