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org.apache.commons.collections4

## Class CollectionUtils

* [java.lang.Object](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true)
  + org.apache.commons.collections4.CollectionUtils
* public class CollectionUtils  
  extends [Object](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true)  
  Provides utility methods and decorators for [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true) instances.  
  Various utility methods might put the input objects into a Set/Map/Bag. In case the input objects override [Object.equals(Object)](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true#equals-java.lang.Object-), it is mandatory that the general contract of the [Object.hashCode()](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true#hashCode--) method is maintained.  
  NOTE: From 4.0, method parameters will take [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true) objects when possible.Since: 1.0

### Field SummaryFields

|  |  |
| --- | --- |
| * + Modifier and Type | * + Field and Description |
| * + static [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true) | * + [EMPTY\_COLLECTION](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#EMPTY_COLLECTION) An empty unmodifiable collection. |

### Method SummaryAll Methods Static Methods Concrete Methods Deprecated Methods

|  |  |
| --- | --- |
| * + Modifier and Type | * + Method and Description |
| * + static <C> boolean | * + [addAll](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#addAll-java.util.Collection-C...-)([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<C> collection, C... elements) Adds all elements in the array to the given collection. |
| * + static <C> boolean | * + [addAll](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#addAll-java.util.Collection-java.util.Enumeration-)([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<C> collection, [Enumeration](https://docs.oracle.com/javase/7/docs/api/java/util/Enumeration.html?is-external=true)<? extends C> enumeration) Adds all elements in the enumeration to the given collection. |
| * + static <C> boolean | * + [addAll](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#addAll-java.util.Collection-java.lang.Iterable-)([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<C> collection, [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends C> iterable) Adds all elements in the [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true) to the given collection. |
| * + static <C> boolean | * + [addAll](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#addAll-java.util.Collection-java.util.Iterator-)([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<C> collection, [Iterator](https://docs.oracle.com/javase/7/docs/api/java/util/Iterator.html?is-external=true)<? extends C> iterator) Adds all elements in the iteration to the given collection. |
| * + static <T> boolean | * + [addIgnoreNull](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#addIgnoreNull-java.util.Collection-T-)([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<T> collection, T object) Adds an element to the collection unless the element is null. |
| * + static <O> int | * + [cardinality](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#cardinality-O-java.lang.Iterable-)(O obj, [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? super O> coll) Deprecated.  since 4.1, use [IterableUtils.frequency(Iterable, Object)](http://docs.google.com/org/apache/commons/collections4/IterableUtils.html#frequency-java.lang.Iterable-T-) instead. Be aware that the order of parameters has changed. |
| * + static <O extends [Comparable](https://docs.oracle.com/javase/7/docs/api/java/lang/Comparable.html?is-external=true)<? super O>> [List](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true)<O> | * + [collate](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#collate-java.lang.Iterable-java.lang.Iterable-)([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends O> a, [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends O> b) Merges two sorted Collections, a and b, into a single, sorted List such that the natural ordering of the elements is retained. |
| * + static <O extends [Comparable](https://docs.oracle.com/javase/7/docs/api/java/lang/Comparable.html?is-external=true)<? super O>> [List](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true)<O> | * + [collate](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#collate-java.lang.Iterable-java.lang.Iterable-boolean-)([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends O> a, [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends O> b, boolean includeDuplicates) Merges two sorted Collections, a and b, into a single, sorted List such that the natural ordering of the elements is retained. |
| * + static <O> [List](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true)<O> | * + [collate](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#collate-java.lang.Iterable-java.lang.Iterable-java.util.Comparator-)([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends O> a, [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends O> b, [Comparator](https://docs.oracle.com/javase/7/docs/api/java/util/Comparator.html?is-external=true)<? super O> c) Merges two sorted Collections, a and b, into a single, sorted List such that the ordering of the elements according to Comparator c is retained. |
| * + static <O> [List](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true)<O> | * + [collate](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#collate-java.lang.Iterable-java.lang.Iterable-java.util.Comparator-boolean-)([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends O> a, [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends O> b, [Comparator](https://docs.oracle.com/javase/7/docs/api/java/util/Comparator.html?is-external=true)<? super O> c, boolean includeDuplicates) Merges two sorted Collections, a and b, into a single, sorted List such that the ordering of the elements according to Comparator c is retained. |
| * + static <I,O,R extends [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<? super O>> R | * + [collect](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#collect-java.lang.Iterable-org.apache.commons.collections4.Transformer-R-)([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends I> inputCollection, [Transformer](http://docs.google.com/org/apache/commons/collections4/Transformer.html)<? super I,? extends O> transformer, R outputCollection) Transforms all elements from input collection with the given transformer and adds them to the output collection. |
| * + static <I,O> [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<O> | * + [collect](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#collect-java.lang.Iterable-org.apache.commons.collections4.Transformer-)([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<I> inputCollection, [Transformer](http://docs.google.com/org/apache/commons/collections4/Transformer.html)<? super I,? extends O> transformer) Returns a new Collection containing all elements of the input collection transformed by the given transformer. |
| * + static <I,O,R extends [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<? super O>> R | * + [collect](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#collect-java.util.Iterator-org.apache.commons.collections4.Transformer-R-)([Iterator](https://docs.oracle.com/javase/7/docs/api/java/util/Iterator.html?is-external=true)<? extends I> inputIterator, [Transformer](http://docs.google.com/org/apache/commons/collections4/Transformer.html)<? super I,? extends O> transformer, R outputCollection) Transforms all elements from the input iterator with the given transformer and adds them to the output collection. |
| * + static <I,O> [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<O> | * + [collect](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#collect-java.util.Iterator-org.apache.commons.collections4.Transformer-)([Iterator](https://docs.oracle.com/javase/7/docs/api/java/util/Iterator.html?is-external=true)<I> inputIterator, [Transformer](http://docs.google.com/org/apache/commons/collections4/Transformer.html)<? super I,? extends O> transformer) Transforms all elements from the input iterator with the given transformer and adds them to the output collection. |
| * + static boolean | * + [containsAll](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#containsAll-java.util.Collection-java.util.Collection-)([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<?> coll1, [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<?> coll2) Returns true iff all elements of coll2 are also contained in coll1. |
| * + static boolean | * + [containsAny](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#containsAny-java.util.Collection-java.util.Collection-)([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<?> coll1, [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<?> coll2) Returns true iff at least one element is in both collections. |
| * + static <T> boolean | * + [containsAny](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#containsAny-java.util.Collection-T...-)([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<?> coll1, T... coll2) Returns true iff at least one element is in both collections. |
| * + static <C> int | * + [countMatches](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#countMatches-java.lang.Iterable-org.apache.commons.collections4.Predicate-)([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<C> input, [Predicate](http://docs.google.com/org/apache/commons/collections4/Predicate.html)<? super C> predicate) Deprecated.  since 4.1, use [IterableUtils.countMatches(Iterable, Predicate)](http://docs.google.com/org/apache/commons/collections4/IterableUtils.html#countMatches-java.lang.Iterable-org.apache.commons.collections4.Predicate-) instead |
| * + static <O> [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<O> | * + [disjunction](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#disjunction-java.lang.Iterable-java.lang.Iterable-)([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends O> a, [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends O> b) Returns a [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true) containing the exclusive disjunction (symmetric difference) of the given [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)s. |
| * + static <T> [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<T> | * + [emptyCollection](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#emptyCollection--)() Returns the immutable EMPTY\_COLLECTION with generic type safety. |
| * + static <T> [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<T> | * + [emptyIfNull](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#emptyIfNull-java.util.Collection-)([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<T> collection) Returns an immutable empty collection if the argument is null, or the argument itself otherwise. |
| * + static <C> boolean | * + [exists](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#exists-java.lang.Iterable-org.apache.commons.collections4.Predicate-)([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<C> input, [Predicate](http://docs.google.com/org/apache/commons/collections4/Predicate.html)<? super C> predicate) Deprecated.  since 4.1, use [IterableUtils.matchesAny(Iterable, Predicate)](http://docs.google.com/org/apache/commons/collections4/IterableUtils.html#matchesAny-java.lang.Iterable-org.apache.commons.collections4.Predicate-) instead |
| * + static <E> E | * + [extractSingleton](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#extractSingleton-java.util.Collection-)([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<E> collection) Extract the lone element of the specified Collection. |
| * + static <T> boolean | * + [filter](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#filter-java.lang.Iterable-org.apache.commons.collections4.Predicate-)([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<T> collection, [Predicate](http://docs.google.com/org/apache/commons/collections4/Predicate.html)<? super T> predicate) Filter the collection by applying a Predicate to each element. |
| * + static <T> boolean | * + [filterInverse](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#filterInverse-java.lang.Iterable-org.apache.commons.collections4.Predicate-)([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<T> collection, [Predicate](http://docs.google.com/org/apache/commons/collections4/Predicate.html)<? super T> predicate) Filter the collection by applying a Predicate to each element. |
| * + static <T> T | * + [find](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#find-java.lang.Iterable-org.apache.commons.collections4.Predicate-)([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<T> collection, [Predicate](http://docs.google.com/org/apache/commons/collections4/Predicate.html)<? super T> predicate) Deprecated.  since 4.1, use [IterableUtils.find(Iterable, Predicate)](http://docs.google.com/org/apache/commons/collections4/IterableUtils.html#find-java.lang.Iterable-org.apache.commons.collections4.Predicate-) instead |
| * + static <T,C extends [Closure](http://docs.google.com/org/apache/commons/collections4/Closure.html)<? super T>> T | * + [forAllButLastDo](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#forAllButLastDo-java.lang.Iterable-C-)([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<T> collection, C closure) Deprecated.  since 4.1, use [IterableUtils.forEachButLast(Iterable, Closure)](http://docs.google.com/org/apache/commons/collections4/IterableUtils.html#forEachButLast-java.lang.Iterable-org.apache.commons.collections4.Closure-) instead |
| * + static <T,C extends [Closure](http://docs.google.com/org/apache/commons/collections4/Closure.html)<? super T>> T | * + [forAllButLastDo](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#forAllButLastDo-java.util.Iterator-C-)([Iterator](https://docs.oracle.com/javase/7/docs/api/java/util/Iterator.html?is-external=true)<T> iterator, C closure) Deprecated.  since 4.1, use [IteratorUtils.forEachButLast(Iterator, Closure)](http://docs.google.com/org/apache/commons/collections4/IteratorUtils.html#forEachButLast-java.util.Iterator-org.apache.commons.collections4.Closure-) instead |
| * + static <T,C extends [Closure](http://docs.google.com/org/apache/commons/collections4/Closure.html)<? super T>> C | * + [forAllDo](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#forAllDo-java.lang.Iterable-C-)([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<T> collection, C closure) Deprecated.  since 4.1, use [IterableUtils.forEach(Iterable, Closure)](http://docs.google.com/org/apache/commons/collections4/IterableUtils.html#forEach-java.lang.Iterable-org.apache.commons.collections4.Closure-) instead |
| * + static <T,C extends [Closure](http://docs.google.com/org/apache/commons/collections4/Closure.html)<? super T>> C | * + [forAllDo](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#forAllDo-java.util.Iterator-C-)([Iterator](https://docs.oracle.com/javase/7/docs/api/java/util/Iterator.html?is-external=true)<T> iterator, C closure) Deprecated.  since 4.1, use [IteratorUtils.forEach(Iterator, Closure)](http://docs.google.com/org/apache/commons/collections4/IteratorUtils.html#forEach-java.util.Iterator-org.apache.commons.collections4.Closure-) instead |
| * + static <T> T | * + [get](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#get-java.lang.Iterable-int-)([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<T> iterable, int index) Deprecated.  since 4.1, use IterableUtils.get(Iterable, int) instead |
| * + static <T> T | * + [get](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#get-java.util.Iterator-int-)([Iterator](https://docs.oracle.com/javase/7/docs/api/java/util/Iterator.html?is-external=true)<T> iterator, int index) Deprecated.  since 4.1, use IteratorUtils.get(Iterator, int) instead |
| * + static <K,V> [Map.Entry](https://docs.oracle.com/javase/7/docs/api/java/util/Map.Entry.html?is-external=true)<K,V> | * + [get](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#get-java.util.Map-int-)([Map](https://docs.oracle.com/javase/7/docs/api/java/util/Map.html?is-external=true)<K,V> map, int index) Returns the index-th Map.Entry in the map's entrySet, throwing IndexOutOfBoundsException if there is no such element. |
| * + static [Object](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true) | * + [get](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#get-java.lang.Object-int-)([Object](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true) object, int index) Returns the index-th value in object, throwing IndexOutOfBoundsException if there is no such element or IllegalArgumentException if object is not an instance of one of the supported types. |
| * + static <O> [Map](https://docs.oracle.com/javase/7/docs/api/java/util/Map.html?is-external=true)<O,[Integer](https://docs.oracle.com/javase/7/docs/api/java/lang/Integer.html?is-external=true)> | * + [getCardinalityMap](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#getCardinalityMap-java.lang.Iterable-)([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends O> coll) Returns a [Map](https://docs.oracle.com/javase/7/docs/api/java/util/Map.html?is-external=true) mapping each unique element in the given [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true) to an [Integer](https://docs.oracle.com/javase/7/docs/api/java/lang/Integer.html?is-external=true) representing the number of occurrences of that element in the [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true). |
| * + static <O> [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<O> | * + [intersection](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#intersection-java.lang.Iterable-java.lang.Iterable-)([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends O> a, [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends O> b) Returns a [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true) containing the intersection of the given [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)s. |
| * + static boolean | * + [isEmpty](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#isEmpty-java.util.Collection-)([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<?> coll) Null-safe check if the specified collection is empty. |
| * + static boolean | * + [isEqualCollection](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#isEqualCollection-java.util.Collection-java.util.Collection-)([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<?> a, [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<?> b) Returns true iff the given [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)s contain exactly the same elements with exactly the same cardinalities. |
| * + static <E> boolean | * + [isEqualCollection](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#isEqualCollection-java.util.Collection-java.util.Collection-org.apache.commons.collections4.Equator-)([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<? extends E> a, [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<? extends E> b, [Equator](http://docs.google.com/org/apache/commons/collections4/Equator.html)<? super E> equator) Returns true iff the given [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)s contain exactly the same elements with exactly the same cardinalities. |
| * + static boolean | * + [isFull](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#isFull-java.util.Collection-)([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<? extends [Object](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true)> coll) Returns true if no more elements can be added to the Collection. |
| * + static boolean | * + [isNotEmpty](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#isNotEmpty-java.util.Collection-)([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<?> coll) Null-safe check if the specified collection is not empty. |
| * + static boolean | * + [isProperSubCollection](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#isProperSubCollection-java.util.Collection-java.util.Collection-)([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<?> a, [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<?> b) Returns true iff *a* is a *proper* sub-collection of *b*, that is, iff the cardinality of *e* in *a* is less than or equal to the cardinality of *e* in *b*, for each element *e* in *a*, and there is at least one element *f* such that the cardinality of *f* in *b* is strictly greater than the cardinality of *f* in *a*. |
| * + static boolean | * + [isSubCollection](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#isSubCollection-java.util.Collection-java.util.Collection-)([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<?> a, [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<?> b) Returns true iff *a* is a sub-collection of *b*, that is, iff the cardinality of *e* in *a* is less than or equal to the cardinality of *e* in *b*, for each element *e* in *a*. |
| * + static <C> boolean | * + [matchesAll](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#matchesAll-java.lang.Iterable-org.apache.commons.collections4.Predicate-)([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<C> input, [Predicate](http://docs.google.com/org/apache/commons/collections4/Predicate.html)<? super C> predicate) Deprecated.  since 4.1, use [IterableUtils.matchesAll(Iterable, Predicate)](http://docs.google.com/org/apache/commons/collections4/IterableUtils.html#matchesAll-java.lang.Iterable-org.apache.commons.collections4.Predicate-) instead |
| * + static int | * + [maxSize](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#maxSize-java.util.Collection-)([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<? extends [Object](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true)> coll) Get the maximum number of elements that the Collection can contain. |
| * + static <E> [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<[List](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true)<E>> | * + [permutations](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#permutations-java.util.Collection-)([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<E> collection) Returns a [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true) of all the permutations of the input collection. |
| * + static <C> [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<C> | * + [predicatedCollection](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#predicatedCollection-java.util.Collection-org.apache.commons.collections4.Predicate-)([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<C> collection, [Predicate](http://docs.google.com/org/apache/commons/collections4/Predicate.html)<? super C> predicate) Returns a predicated (validating) collection backed by the given collection. |
| * + static <E> [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<E> | * + [removeAll](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#removeAll-java.util.Collection-java.util.Collection-)([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<E> collection, [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<?> remove) Removes the elements in remove from collection. |
| * + static <E> [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<E> | * + [removeAll](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#removeAll-java.lang.Iterable-java.lang.Iterable-org.apache.commons.collections4.Equator-)([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<E> collection, [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends E> remove, [Equator](http://docs.google.com/org/apache/commons/collections4/Equator.html)<? super E> equator) Removes all elements in remove from collection. |
| * + static <C> [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<C> | * + [retainAll](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#retainAll-java.util.Collection-java.util.Collection-)([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<C> collection, [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<?> retain) Returns a collection containing all the elements in collection that are also in retain. |
| * + static <E> [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<E> | * + [retainAll](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#retainAll-java.lang.Iterable-java.lang.Iterable-org.apache.commons.collections4.Equator-)([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<E> collection, [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends E> retain, [Equator](http://docs.google.com/org/apache/commons/collections4/Equator.html)<? super E> equator) Returns a collection containing all the elements in collection that are also in retain. |
| * + static void | * + [reverseArray](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#reverseArray-java.lang.Object:A-)([Object](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true)[] array) Reverses the order of the given array. |
| * + static <O> [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<O> | * + [select](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#select-java.lang.Iterable-org.apache.commons.collections4.Predicate-)([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends O> inputCollection, [Predicate](http://docs.google.com/org/apache/commons/collections4/Predicate.html)<? super O> predicate) Selects all elements from input collection which match the given predicate into an output collection. |
| * + static <O,R extends [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<? super O>> R | * + [select](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#select-java.lang.Iterable-org.apache.commons.collections4.Predicate-R-)([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends O> inputCollection, [Predicate](http://docs.google.com/org/apache/commons/collections4/Predicate.html)<? super O> predicate, R outputCollection) Selects all elements from input collection which match the given predicate and adds them to outputCollection. |
| * + static <O,R extends [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<? super O>> R | * + [select](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#select-java.lang.Iterable-org.apache.commons.collections4.Predicate-R-R-)([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends O> inputCollection, [Predicate](http://docs.google.com/org/apache/commons/collections4/Predicate.html)<? super O> predicate, R outputCollection, R rejectedCollection) Selects all elements from inputCollection into an output and rejected collection, based on the evaluation of the given predicate. |
| * + static <O> [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<O> | * + [selectRejected](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#selectRejected-java.lang.Iterable-org.apache.commons.collections4.Predicate-)([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends O> inputCollection, [Predicate](http://docs.google.com/org/apache/commons/collections4/Predicate.html)<? super O> predicate) Selects all elements from inputCollection which don't match the given predicate into an output collection. |
| * + static <O,R extends [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<? super O>> R | * + [selectRejected](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#selectRejected-java.lang.Iterable-org.apache.commons.collections4.Predicate-R-)([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends O> inputCollection, [Predicate](http://docs.google.com/org/apache/commons/collections4/Predicate.html)<? super O> predicate, R outputCollection) Selects all elements from inputCollection which don't match the given predicate and adds them to outputCollection. |
| * + static int | * + [size](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#size-java.lang.Object-)([Object](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true) object) Gets the size of the collection/iterator specified. |
| * + static boolean | * + [sizeIsEmpty](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#sizeIsEmpty-java.lang.Object-)([Object](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true) object) Checks if the specified collection/array/iterator is empty. |
| * + static <O> [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<O> | * + [subtract](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#subtract-java.lang.Iterable-java.lang.Iterable-)([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends O> a, [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends O> b) Returns a new [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true) containing <i>a</i> - <i>b</i>. |
| * + static <O> [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<O> | * + [subtract](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#subtract-java.lang.Iterable-java.lang.Iterable-org.apache.commons.collections4.Predicate-)([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends O> a, [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends O> b, [Predicate](http://docs.google.com/org/apache/commons/collections4/Predicate.html)<O> p) Returns a new [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true) containing *a* minus a subset of *b*. |
| * + static <C> [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<C> | * + [synchronizedCollection](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#synchronizedCollection-java.util.Collection-)([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<C> collection) Deprecated.  since 4.1, use [Collections.synchronizedCollection(Collection)](https://docs.oracle.com/javase/7/docs/api/java/util/Collections.html?is-external=true#synchronizedCollection-java.util.Collection-) instead |
| * + static <C> void | * + [transform](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#transform-java.util.Collection-org.apache.commons.collections4.Transformer-)([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<C> collection, [Transformer](http://docs.google.com/org/apache/commons/collections4/Transformer.html)<? super C,? extends C> transformer) Transform the collection by applying a Transformer to each element. |
| * + static <E> [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<E> | * + [transformingCollection](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#transformingCollection-java.util.Collection-org.apache.commons.collections4.Transformer-)([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<E> collection, [Transformer](http://docs.google.com/org/apache/commons/collections4/Transformer.html)<? super E,? extends E> transformer) Returns a transformed bag backed by the given collection. |
| * + static <O> [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<O> | * + [union](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#union-java.lang.Iterable-java.lang.Iterable-)([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends O> a, [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends O> b) Returns a [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true) containing the union of the given [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)s. |
| * + static <C> [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<C> | * + [unmodifiableCollection](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#unmodifiableCollection-java.util.Collection-)([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<? extends C> collection) Deprecated.  since 4.1, use [Collections.unmodifiableCollection(Collection)](https://docs.oracle.com/javase/7/docs/api/java/util/Collections.html?is-external=true#unmodifiableCollection-java.util.Collection-) instead |

### 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\_COLLECTION public static final [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true) EMPTY\_COLLECTION An empty unmodifiable collection. The JDK provides empty Set and List implementations which could be used for this purpose. However they could be cast to Set or List which might be undesirable. This implementation only implements Collection.

### Method Detail

#### emptyCollection public static <T> [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<T> emptyCollection() Returns the immutable EMPTY\_COLLECTION with generic type safety.Type Parameters: T - the element type Returns: immutable empty collection Since: 4.0 See Also: [EMPTY\_COLLECTION](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#EMPTY_COLLECTION)

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

#### union public static <O> [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<O> union([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends O> a, [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends O> b) Returns a [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true) containing the union of the given [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)s. The cardinality of each element in the returned [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true) will be equal to the maximum of the cardinality of that element in the two given [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)s.Type Parameters: O - the generic type that is able to represent the types contained in both input collections. Parameters: a - the first collection, must not be null b - the second collection, must not be null Returns: the union of the two collections See Also: [Collection.addAll(java.util.Collection<? extends E>)](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true#addAll-java.util.Collection-)

#### intersection public static <O> [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<O> intersection([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends O> a, [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends O> b) Returns a [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true) containing the intersection of the given [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)s. The cardinality of each element in the returned [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true) will be equal to the minimum of the cardinality of that element in the two given [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)s.Type Parameters: O - the generic type that is able to represent the types contained in both input collections. Parameters: a - the first collection, must not be null b - the second collection, must not be null Returns: the intersection of the two collections See Also: [Collection.retainAll(java.util.Collection<?>)](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true#retainAll-java.util.Collection-), [containsAny(java.util.Collection<?>, T...)](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#containsAny-java.util.Collection-T...-)

#### disjunction public static <O> [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<O> disjunction([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends O> a, [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends O> b) Returns a [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true) containing the exclusive disjunction (symmetric difference) of the given [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)s. The cardinality of each element *e* in the returned [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true) will be equal to max(cardinality(*e*,*a*),cardinality(*e*,*b*)) - min(cardinality(*e*,*a*), cardinality(*e*,*b*)). This is equivalent to {@link #subtract subtract}({@link #union union(a,b)},{@link #intersection intersection(a,b)}) or {@link #union union}({@link #subtract subtract(a,b)},{@link #subtract subtract(b,a)}).Type Parameters: O - the generic type that is able to represent the types contained in both input collections. Parameters: a - the first collection, must not be null b - the second collection, must not be null Returns: the symmetric difference of the two collections

#### subtract public static <O> [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<O> subtract([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends O> a, [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends O> b) Returns a new [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true) containing <i>a</i> - <i>b</i>. The cardinality of each element *e* in the returned [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true) will be the cardinality of *e* in *a* minus the cardinality of *e* in *b*, or zero, whichever is greater.Type Parameters: O - the generic type that is able to represent the types contained in both input collections. Parameters: a - the collection to subtract from, must not be null b - the collection to subtract, must not be null Returns: a new collection with the results See Also: [Collection.removeAll(java.util.Collection<?>)](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true#removeAll-java.util.Collection-)

#### subtract public static <O> [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<O> subtract([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends O> a, [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends O> b, [Predicate](http://docs.google.com/org/apache/commons/collections4/Predicate.html)<O> p) Returns a new [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true) containing *a* minus a subset of *b*. Only the elements of *b* that satisfy the predicate condition, *p* are subtracted from *a*. The cardinality of each element *e* in the returned [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true) that satisfies the predicate condition will be the cardinality of *e* in *a* minus the cardinality of *e* in *b*, or zero, whichever is greater. The cardinality of each element *e* in the returned [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true) that does **not** satisfy the predicate condition will be equal to the cardinality of *e* in *a*.Type Parameters: O - the generic type that is able to represent the types contained in both input collections. Parameters: a - the collection to subtract from, must not be null b - the collection to subtract, must not be null p - the condition used to determine which elements of *b* are subtracted. Returns: a new collection with the results Since: 4.0 See Also: [Collection.removeAll(java.util.Collection<?>)](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true#removeAll-java.util.Collection-)

#### containsAll public static boolean containsAll([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<?> coll1, [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<?> coll2) Returns true iff all elements of coll2 are also contained in coll1. The cardinality of values in coll2 is not taken into account, which is the same behavior as [Collection.containsAll(Collection)](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true#containsAll-java.util.Collection-). In other words, this method returns true iff the [intersection(java.lang.Iterable<? extends O>, java.lang.Iterable<? extends O>)](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#intersection-java.lang.Iterable-java.lang.Iterable-) of *coll1* and *coll2* has the same cardinality as the set of unique values from coll2. In case coll2 is empty, true will be returned. This method is intended as a replacement for [Collection.containsAll(Collection)](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true#containsAll-java.util.Collection-) with a guaranteed runtime complexity of O(n + m). Depending on the type of [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true) provided, this method will be much faster than calling [Collection.containsAll(Collection)](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true#containsAll-java.util.Collection-) instead, though this will come at the cost of an additional space complexity O(n).Parameters: coll1 - the first collection, must not be null coll2 - the second collection, must not be null Returns: true iff the intersection of the collections has the same cardinality as the set of unique elements from the second collection Since: 4.0

#### containsAny public static <T> boolean containsAny([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<?> coll1, T... coll2) Returns true iff at least one element is in both collections. In other words, this method returns true iff the [intersection(java.lang.Iterable<? extends O>, java.lang.Iterable<? extends O>)](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#intersection-java.lang.Iterable-java.lang.Iterable-) of *coll1* and *coll2* is not empty.Type Parameters: T - the type of object to lookup in coll1. Parameters: coll1 - the first collection, must not be null coll2 - the second collection, must not be null Returns: true iff the intersection of the collections is non-empty Since: 4.2 See Also: [intersection(java.lang.Iterable<? extends O>, java.lang.Iterable<? extends O>)](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#intersection-java.lang.Iterable-java.lang.Iterable-)

#### containsAny public static boolean containsAny([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<?> coll1, [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<?> coll2) Returns true iff at least one element is in both collections. In other words, this method returns true iff the [intersection(java.lang.Iterable<? extends O>, java.lang.Iterable<? extends O>)](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#intersection-java.lang.Iterable-java.lang.Iterable-) of *coll1* and *coll2* is not empty.Parameters: coll1 - the first collection, must not be null coll2 - the second collection, must not be null Returns: true iff the intersection of the collections is non-empty Since: 2.1 See Also: [intersection(java.lang.Iterable<? extends O>, java.lang.Iterable<? extends O>)](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#intersection-java.lang.Iterable-java.lang.Iterable-)

#### getCardinalityMap public static <O> [Map](https://docs.oracle.com/javase/7/docs/api/java/util/Map.html?is-external=true)<O,[Integer](https://docs.oracle.com/javase/7/docs/api/java/lang/Integer.html?is-external=true)> getCardinalityMap([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends O> coll) Returns a [Map](https://docs.oracle.com/javase/7/docs/api/java/util/Map.html?is-external=true) mapping each unique element in the given [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true) to an [Integer](https://docs.oracle.com/javase/7/docs/api/java/lang/Integer.html?is-external=true) representing the number of occurrences of that element in the [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true). Only those elements present in the collection will appear as keys in the map.Type Parameters: O - the type of object in the returned [Map](https://docs.oracle.com/javase/7/docs/api/java/util/Map.html?is-external=true). This is a super type of <I>. Parameters: coll - the collection to get the cardinality map for, must not be null Returns: the populated cardinality map

#### isSubCollection public static boolean isSubCollection([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<?> a, [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<?> b) Returns true iff *a* is a sub-collection of *b*, that is, iff the cardinality of *e* in *a* is less than or equal to the cardinality of *e* in *b*, for each element *e* in *a*.Parameters: a - the first (sub?) collection, must not be null b - the second (super?) collection, must not be null Returns: true iff *a* is a sub-collection of *b* See Also: [isProperSubCollection(java.util.Collection<?>, java.util.Collection<?>)](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#isProperSubCollection-java.util.Collection-java.util.Collection-), [Collection.containsAll(java.util.Collection<?>)](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true#containsAll-java.util.Collection-)

#### isProperSubCollection public static boolean isProperSubCollection([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<?> a, [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<?> b)

* + - Returns true iff *a* is a *proper* sub-collection of *b*, that is, iff the cardinality of *e* in *a* is less than or equal to the cardinality of *e* in *b*, for each element *e* in *a*, and there is at least one element *f* such that the cardinality of *f* in *b* is strictly greater than the cardinality of *f* in *a*.  
      The implementation assumes
      * a.size() and b.size() represent the total cardinality of *a* and *b*, resp.
      * a.size() < Integer.MAXVALUE

Parameters: a - the first (sub?) collection, must not be null b - the second (super?) collection, must not be null Returns: true iff *a* is a *proper* sub-collection of *b* See Also: [isSubCollection(java.util.Collection<?>, java.util.Collection<?>)](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#isSubCollection-java.util.Collection-java.util.Collection-), [Collection.containsAll(java.util.Collection<?>)](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true#containsAll-java.util.Collection-)

#### isEqualCollection public static boolean isEqualCollection([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<?> a, [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<?> b) Returns true iff the given [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)s contain exactly the same elements with exactly the same cardinalities. That is, iff the cardinality of *e* in *a* is equal to the cardinality of *e* in *b*, for each element *e* in *a* or *b*.Parameters: a - the first collection, must not be null b - the second collection, must not be null Returns: true iff the collections contain the same elements with the same cardinalities.

#### isEqualCollection public static <E> boolean isEqualCollection([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<? extends E> a, [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<? extends E> b, [Equator](http://docs.google.com/org/apache/commons/collections4/Equator.html)<? super E> equator) Returns true iff the given [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)s contain exactly the same elements with exactly the same cardinalities. That is, iff the cardinality of *e* in *a* is equal to the cardinality of *e* in *b*, for each element *e* in *a* or *b*. **Note:** from version 4.1 onwards this method requires the input collections and equator to be of compatible type (using bounded wildcards). Providing incompatible arguments (e.g. by casting to their rawtypes) will result in a ClassCastException thrown at runtime.Type Parameters: E - the element type Parameters: a - the first collection, must not be null b - the second collection, must not be null equator - the Equator used for testing equality Returns: true iff the collections contain the same elements with the same cardinalities. Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if the equator is null Since: 4.0

#### cardinality [@Deprecated](https://docs.oracle.com/javase/7/docs/api/java/lang/Deprecated.html?is-external=true) public static <O> int cardinality(O obj, [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? super O> coll) Deprecated. since 4.1, use [IterableUtils.frequency(Iterable, Object)](http://docs.google.com/org/apache/commons/collections4/IterableUtils.html#frequency-java.lang.Iterable-T-) instead. Be aware that the order of parameters has changed. Returns the number of occurrences of *obj* in *coll*.Type Parameters: O - the type of object that the [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true) may contain. Parameters: obj - the object to find the cardinality of coll - the [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true) to search Returns: the number of occurrences of obj in coll Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if coll is null

#### find [@Deprecated](https://docs.oracle.com/javase/7/docs/api/java/lang/Deprecated.html?is-external=true) public static <T> T find([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<T> collection, [Predicate](http://docs.google.com/org/apache/commons/collections4/Predicate.html)<? super T> predicate) Deprecated. since 4.1, use [IterableUtils.find(Iterable, Predicate)](http://docs.google.com/org/apache/commons/collections4/IterableUtils.html#find-java.lang.Iterable-org.apache.commons.collections4.Predicate-) instead Finds the first element in the given collection which matches the given predicate. If the input collection or predicate is null, or no element of the collection matches the predicate, null is returned.Type Parameters: T - the type of object the [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true) contains Parameters: collection - the collection to search, may be null predicate - the predicate to use, may be null Returns: the first element of the collection which matches the predicate or null if none could be found

#### forAllDo [@Deprecated](https://docs.oracle.com/javase/7/docs/api/java/lang/Deprecated.html?is-external=true) public static <T,C extends [Closure](http://docs.google.com/org/apache/commons/collections4/Closure.html)<? super T>> C forAllDo([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<T> collection, C closure) Deprecated. since 4.1, use [IterableUtils.forEach(Iterable, Closure)](http://docs.google.com/org/apache/commons/collections4/IterableUtils.html#forEach-java.lang.Iterable-org.apache.commons.collections4.Closure-) instead Executes the given closure on each element in the collection. If the input collection or closure is null, there is no change made.Type Parameters: T - the type of object the [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true) contains C - the closure type Parameters: collection - the collection to get the input from, may be null closure - the closure to perform, may be null Returns: closure

#### forAllDo [@Deprecated](https://docs.oracle.com/javase/7/docs/api/java/lang/Deprecated.html?is-external=true) public static <T,C extends [Closure](http://docs.google.com/org/apache/commons/collections4/Closure.html)<? super T>> C forAllDo([Iterator](https://docs.oracle.com/javase/7/docs/api/java/util/Iterator.html?is-external=true)<T> iterator, C closure) Deprecated. since 4.1, use [IteratorUtils.forEach(Iterator, Closure)](http://docs.google.com/org/apache/commons/collections4/IteratorUtils.html#forEach-java.util.Iterator-org.apache.commons.collections4.Closure-) instead Executes the given closure on each element in the collection. If the input collection or closure is null, there is no change made.Type Parameters: T - the type of object the [Iterator](https://docs.oracle.com/javase/7/docs/api/java/util/Iterator.html?is-external=true) contains C - the closure type Parameters: iterator - the iterator to get the input from, may be null closure - the closure to perform, may be null Returns: closure Since: 4.0

#### forAllButLastDo [@Deprecated](https://docs.oracle.com/javase/7/docs/api/java/lang/Deprecated.html?is-external=true) public static <T,C extends [Closure](http://docs.google.com/org/apache/commons/collections4/Closure.html)<? super T>> T forAllButLastDo([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<T> collection, C closure) Deprecated. since 4.1, use [IterableUtils.forEachButLast(Iterable, Closure)](http://docs.google.com/org/apache/commons/collections4/IterableUtils.html#forEachButLast-java.lang.Iterable-org.apache.commons.collections4.Closure-) instead Executes the given closure on each but the last element in the collection. If the input collection or closure is null, there is no change made.Type Parameters: T - the type of object the [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true) contains C - the closure type Parameters: collection - the collection to get the input from, may be null closure - the closure to perform, may be null Returns: the last element in the collection, or null if either collection or closure is null Since: 4.0

#### forAllButLastDo [@Deprecated](https://docs.oracle.com/javase/7/docs/api/java/lang/Deprecated.html?is-external=true) public static <T,C extends [Closure](http://docs.google.com/org/apache/commons/collections4/Closure.html)<? super T>> T forAllButLastDo([Iterator](https://docs.oracle.com/javase/7/docs/api/java/util/Iterator.html?is-external=true)<T> iterator, C closure) Deprecated. since 4.1, use [IteratorUtils.forEachButLast(Iterator, Closure)](http://docs.google.com/org/apache/commons/collections4/IteratorUtils.html#forEachButLast-java.util.Iterator-org.apache.commons.collections4.Closure-) instead Executes the given closure on each but the last element in the collection. If the input collection or closure is null, there is no change made.Type Parameters: T - the type of object the [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true) contains C - the closure type Parameters: iterator - the iterator to get the input from, may be null closure - the closure to perform, may be null Returns: the last element in the collection, or null if either iterator or closure is null Since: 4.0

#### filter public static <T> boolean filter([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<T> collection, [Predicate](http://docs.google.com/org/apache/commons/collections4/Predicate.html)<? super T> predicate) Filter the collection by applying a Predicate to each element. If the predicate returns false, remove the element. If the input collection or predicate is null, there is no change made.Type Parameters: T - the type of object the [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true) contains Parameters: collection - the collection to get the input from, may be null predicate - the predicate to use as a filter, may be null Returns: true if the collection is modified by this call, false otherwise.

#### filterInverse public static <T> boolean filterInverse([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<T> collection, [Predicate](http://docs.google.com/org/apache/commons/collections4/Predicate.html)<? super T> predicate) Filter the collection by applying a Predicate to each element. If the predicate returns true, remove the element. This is equivalent to filter(collection, PredicateUtils.notPredicate(predicate)) if predicate is != null. If the input collection or predicate is null, there is no change made.Type Parameters: T - the type of object the [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true) contains Parameters: collection - the collection to get the input from, may be null predicate - the predicate to use as a filter, may be null Returns: true if the collection is modified by this call, false otherwise.

#### transform public static <C> void transform([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<C> collection, [Transformer](http://docs.google.com/org/apache/commons/collections4/Transformer.html)<? super C,? extends C> transformer) Transform the collection by applying a Transformer to each element. If the input collection or transformer is null, there is no change made. This routine is best for Lists, for which set() is used to do the transformations "in place." For other Collections, clear() and addAll() are used to replace elements. If the input collection controls its input, such as a Set, and the Transformer creates duplicates (or are otherwise invalid), the collection may reduce in size due to calling this method.Type Parameters: C - the type of object the [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true) contains Parameters: collection - the [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true) to get the input from, may be null transformer - the transformer to perform, may be null

#### countMatches [@Deprecated](https://docs.oracle.com/javase/7/docs/api/java/lang/Deprecated.html?is-external=true) public static <C> int countMatches([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<C> input, [Predicate](http://docs.google.com/org/apache/commons/collections4/Predicate.html)<? super C> predicate) Deprecated. since 4.1, use [IterableUtils.countMatches(Iterable, Predicate)](http://docs.google.com/org/apache/commons/collections4/IterableUtils.html#countMatches-java.lang.Iterable-org.apache.commons.collections4.Predicate-) instead Counts the number of elements in the input collection that match the predicate. A null collection or predicate matches no elements.Type Parameters: C - the type of object the [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true) contains Parameters: input - the [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true) to get the input from, may be null predicate - the predicate to use, may be null Returns: the number of matches for the predicate in the collection

#### exists [@Deprecated](https://docs.oracle.com/javase/7/docs/api/java/lang/Deprecated.html?is-external=true) public static <C> boolean exists([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<C> input, [Predicate](http://docs.google.com/org/apache/commons/collections4/Predicate.html)<? super C> predicate) Deprecated. since 4.1, use [IterableUtils.matchesAny(Iterable, Predicate)](http://docs.google.com/org/apache/commons/collections4/IterableUtils.html#matchesAny-java.lang.Iterable-org.apache.commons.collections4.Predicate-) instead Answers true if a predicate is true for at least one element of a collection. A null collection or predicate returns false.Type Parameters: C - the type of object the [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true) contains Parameters: input - the [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true) to get the input from, may be null predicate - the predicate to use, may be null Returns: true if at least one element of the collection matches the predicate

#### matchesAll [@Deprecated](https://docs.oracle.com/javase/7/docs/api/java/lang/Deprecated.html?is-external=true) public static <C> boolean matchesAll([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<C> input, [Predicate](http://docs.google.com/org/apache/commons/collections4/Predicate.html)<? super C> predicate) Deprecated. since 4.1, use [IterableUtils.matchesAll(Iterable, Predicate)](http://docs.google.com/org/apache/commons/collections4/IterableUtils.html#matchesAll-java.lang.Iterable-org.apache.commons.collections4.Predicate-) instead Answers true if a predicate is true for every element of a collection. A null predicate returns false. A null or empty collection returns true.Type Parameters: C - the type of object the [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true) contains Parameters: input - the [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true) to get the input from, may be null predicate - the predicate to use, may be null Returns: true if every element of the collection matches the predicate or if the collection is empty, false otherwise Since: 4.0

#### select public static <O> [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<O> select([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends O> inputCollection, [Predicate](http://docs.google.com/org/apache/commons/collections4/Predicate.html)<? super O> predicate) Selects all elements from input collection which match the given predicate into an output collection. A null predicate matches no elements.Type Parameters: O - the type of object the [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true) contains Parameters: inputCollection - the collection to get the input from, may not be null predicate - the predicate to use, may be null Returns: the elements matching the predicate (new list) Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if the input collection is null

#### select public static <O,R extends [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<? super O>> R select([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends O> inputCollection, [Predicate](http://docs.google.com/org/apache/commons/collections4/Predicate.html)<? super O> predicate, R outputCollection) Selects all elements from input collection which match the given predicate and adds them to outputCollection. If the input collection or predicate is null, there is no change to the output collection.Type Parameters: O - the type of object the [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true) contains R - the type of the output [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true) Parameters: inputCollection - the collection to get the input from, may be null predicate - the predicate to use, may be null outputCollection - the collection to output into, may not be null if the inputCollection and predicate or not null Returns: the outputCollection

#### select public static <O,R extends [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<? super O>> R select([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends O> inputCollection, [Predicate](http://docs.google.com/org/apache/commons/collections4/Predicate.html)<? super O> predicate, R outputCollection, R rejectedCollection) Selects all elements from inputCollection into an output and rejected collection, based on the evaluation of the given predicate. Elements matching the predicate are added to the outputCollection, all other elements are added to the rejectedCollection. If the input predicate is null, no elements are added to outputCollection or rejectedCollection. Note: calling the method is equivalent to the following code snippet: select(inputCollection, predicate, outputCollection); selectRejected(inputCollection, predicate, rejectedCollection); Type Parameters: O - the type of object the [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true) contains R - the type of the output [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true) Parameters: inputCollection - the collection to get the input from, may be null predicate - the predicate to use, may be null outputCollection - the collection to output selected elements into, may not be null if the inputCollection and predicate are not null rejectedCollection - the collection to output rejected elements into, may not be null if the inputCollection or predicate are not null Returns: the outputCollection Since: 4.1

#### selectRejected public static <O> [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<O> selectRejected([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends O> inputCollection, [Predicate](http://docs.google.com/org/apache/commons/collections4/Predicate.html)<? super O> predicate) Selects all elements from inputCollection which don't match the given predicate into an output collection. If the input predicate is null, the result is an empty list.Type Parameters: O - the type of object the [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true) contains Parameters: inputCollection - the collection to get the input from, may not be null predicate - the predicate to use, may be null Returns: the elements **not** matching the predicate (new list) Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if the input collection is null

#### selectRejected public static <O,R extends [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<? super O>> R selectRejected([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends O> inputCollection, [Predicate](http://docs.google.com/org/apache/commons/collections4/Predicate.html)<? super O> predicate, R outputCollection) Selects all elements from inputCollection which don't match the given predicate and adds them to outputCollection. If the input predicate is null, no elements are added to outputCollection.Type Parameters: O - the type of object the [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true) contains R - the type of the output [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true) Parameters: inputCollection - the collection to get the input from, may be null predicate - the predicate to use, may be null outputCollection - the collection to output into, may not be null if the inputCollection and predicate or not null Returns: outputCollection

#### collect public static <I,O> [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<O> collect([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<I> inputCollection, [Transformer](http://docs.google.com/org/apache/commons/collections4/Transformer.html)<? super I,? extends O> transformer) Returns a new Collection containing all elements of the input collection transformed by the given transformer. If the input collection or transformer is null, the result is an empty list.Type Parameters: I - the type of object in the input collection O - the type of object in the output collection Parameters: inputCollection - the collection to get the input from, may not be null transformer - the transformer to use, may be null Returns: the transformed result (new list) Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if the input collection is null

#### collect public static <I,O> [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<O> collect([Iterator](https://docs.oracle.com/javase/7/docs/api/java/util/Iterator.html?is-external=true)<I> inputIterator, [Transformer](http://docs.google.com/org/apache/commons/collections4/Transformer.html)<? super I,? extends O> transformer) Transforms all elements from the input iterator with the given transformer and adds them to the output collection. If the input iterator or transformer is null, the result is an empty list.Type Parameters: I - the type of object in the input collection O - the type of object in the output collection Parameters: inputIterator - the iterator to get the input from, may be null transformer - the transformer to use, may be null Returns: the transformed result (new list)

#### collect public static <I,O,R extends [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<? super O>> R collect([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends I> inputCollection, [Transformer](http://docs.google.com/org/apache/commons/collections4/Transformer.html)<? super I,? extends O> transformer, R outputCollection) Transforms all elements from input collection with the given transformer and adds them to the output collection. If the input collection or transformer is null, there is no change to the output collection.Type Parameters: I - the type of object in the input collection O - the type of object in the output collection R - the type of the output collection Parameters: inputCollection - the collection to get the input from, may be null transformer - the transformer to use, may be null outputCollection - the collection to output into, may not be null if inputCollection and transformer are not null Returns: the output collection with the transformed input added Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if the outputCollection is null and both, inputCollection and transformer are not null

#### collect public static <I,O,R extends [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<? super O>> R collect([Iterator](https://docs.oracle.com/javase/7/docs/api/java/util/Iterator.html?is-external=true)<? extends I> inputIterator, [Transformer](http://docs.google.com/org/apache/commons/collections4/Transformer.html)<? super I,? extends O> transformer, R outputCollection) Transforms all elements from the input iterator with the given transformer and adds them to the output collection. If the input iterator or transformer is null, there is no change to the output collection.Type Parameters: I - the type of object in the input collection O - the type of object in the output collection R - the type of the output collection Parameters: inputIterator - the iterator to get the input from, may be null transformer - the transformer to use, may be null outputCollection - the collection to output into, may not be null if inputIterator and transformer are not null Returns: the outputCollection with the transformed input added Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if the output collection is null and both, inputIterator and transformer are not null

#### addIgnoreNull public static <T> boolean addIgnoreNull([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<T> collection, T object) Adds an element to the collection unless the element is null.Type Parameters: T - the type of object the [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true) contains Parameters: collection - the collection to add to, must not be null object - the object to add, if null it will not be added Returns: true if the collection changed Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if the collection is null Since: 3.2

#### addAll public static <C> boolean addAll([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<C> collection, [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends C> iterable) Adds all elements in the [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true) to the given collection. If the [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true) is a [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true) then it is cast and will be added using [Collection.addAll(Collection)](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true#addAll-java.util.Collection-) instead of iterating.Type Parameters: C - the type of object the [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true) contains Parameters: collection - the collection to add to, must not be null iterable - the iterable of elements to add, must not be null Returns: a boolean indicating whether the collection has changed or not. Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if the collection or iterator is null

#### addAll public static <C> boolean addAll([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<C> collection, [Iterator](https://docs.oracle.com/javase/7/docs/api/java/util/Iterator.html?is-external=true)<? extends C> iterator) Adds all elements in the iteration to the given collection.Type Parameters: C - the type of object the [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true) contains Parameters: collection - the collection to add to, must not be null iterator - the iterator of elements to add, must not be null Returns: a boolean indicating whether the collection has changed or not. Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if the collection or iterator is null

#### addAll public static <C> boolean addAll([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<C> collection, [Enumeration](https://docs.oracle.com/javase/7/docs/api/java/util/Enumeration.html?is-external=true)<? extends C> enumeration) Adds all elements in the enumeration to the given collection.Type Parameters: C - the type of object the [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true) contains Parameters: collection - the collection to add to, must not be null enumeration - the enumeration of elements to add, must not be null Returns: true if the collections was changed, false otherwise Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if the collection or enumeration is null

#### addAll public static <C> boolean addAll([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<C> collection, C... elements) Adds all elements in the array to the given collection.Type Parameters: C - the type of object the [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true) contains Parameters: collection - the collection to add to, must not be null elements - the array of elements to add, must not be null Returns: true if the collection was changed, false otherwise Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if the collection or array is null

#### get [@Deprecated](https://docs.oracle.com/javase/7/docs/api/java/lang/Deprecated.html?is-external=true) public static <T> T get([Iterator](https://docs.oracle.com/javase/7/docs/api/java/util/Iterator.html?is-external=true)<T> iterator, int index) Deprecated. since 4.1, use IteratorUtils.get(Iterator, int) instead Returns the index-th value in [Iterator](https://docs.oracle.com/javase/7/docs/api/java/util/Iterator.html?is-external=true), throwing IndexOutOfBoundsException if there is no such element. The Iterator is advanced to index (or to the end, if index exceeds the number of entries) as a side effect of this method.Type Parameters: T - the type of object in the [Iterator](https://docs.oracle.com/javase/7/docs/api/java/util/Iterator.html?is-external=true) Parameters: iterator - the iterator to get a value from index - the index to get Returns: the object at the specified index Throws: [IndexOutOfBoundsException](https://docs.oracle.com/javase/7/docs/api/java/lang/IndexOutOfBoundsException.html?is-external=true) - if the index is invalid [IllegalArgumentException](https://docs.oracle.com/javase/7/docs/api/java/lang/IllegalArgumentException.html?is-external=true) - if the object type is invalid

#### get [@Deprecated](https://docs.oracle.com/javase/7/docs/api/java/lang/Deprecated.html?is-external=true) public static <T> T get([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<T> iterable, int index) Deprecated. since 4.1, use IterableUtils.get(Iterable, int) instead Returns the index-th value in the iterable's [Iterator](https://docs.oracle.com/javase/7/docs/api/java/util/Iterator.html?is-external=true), throwing IndexOutOfBoundsException if there is no such element. If the [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true) is a [List](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true), then it will use [List.get(int)](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true#get-int-).Type Parameters: T - the type of object in the [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true). Parameters: iterable - the [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true) to get a value from index - the index to get Returns: the object at the specified index Throws: [IndexOutOfBoundsException](https://docs.oracle.com/javase/7/docs/api/java/lang/IndexOutOfBoundsException.html?is-external=true) - if the index is invalid

#### get public static [Object](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true) get([Object](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true) object, int index)

* + - Returns the index-th value in object, throwing IndexOutOfBoundsException if there is no such element or IllegalArgumentException if object is not an instance of one of the supported types.  
      The supported types, and associated semantics are:
      * Map -- the value returned is the Map.Entry in position index in the map's entrySet iterator, if there is such an entry.
      * List -- this method is equivalent to the list's get method.
      * Array -- the index-th array entry is returned, if there is such an entry; otherwise an IndexOutOfBoundsException is thrown.
      * Collection -- the value returned is the index-th object returned by the collection's default iterator, if there is such an element.
      * Iterator or Enumeration -- the value returned is the index-th object in the Iterator/Enumeration, if there is such an element. The Iterator/Enumeration is advanced to index (or to the end, if index exceeds the number of entries) as a side effect of this method.

Parameters: object - the object to get a value from index - the index to get Returns: the object at the specified index Throws: [IndexOutOfBoundsException](https://docs.oracle.com/javase/7/docs/api/java/lang/IndexOutOfBoundsException.html?is-external=true) - if the index is invalid [IllegalArgumentException](https://docs.oracle.com/javase/7/docs/api/java/lang/IllegalArgumentException.html?is-external=true) - if the object type is invalid

#### get public static <K,V> [Map.Entry](https://docs.oracle.com/javase/7/docs/api/java/util/Map.Entry.html?is-external=true)<K,V> get([Map](https://docs.oracle.com/javase/7/docs/api/java/util/Map.html?is-external=true)<K,V> map, int index) Returns the index-th Map.Entry in the map's entrySet, throwing IndexOutOfBoundsException if there is no such element.Type Parameters: K - the key type in the [Map](https://docs.oracle.com/javase/7/docs/api/java/util/Map.html?is-external=true) V - the key type in the [Map](https://docs.oracle.com/javase/7/docs/api/java/util/Map.html?is-external=true) Parameters: map - the object to get a value from index - the index to get Returns: the object at the specified index Throws: [IndexOutOfBoundsException](https://docs.oracle.com/javase/7/docs/api/java/lang/IndexOutOfBoundsException.html?is-external=true) - if the index is invalid

#### size public static int size([Object](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true) object)

* + - Gets the size of the collection/iterator specified.  
      This method can handles objects as follows
      * Collection - the collection size
      * Map - the map size
      * Array - the array size
      * Iterator - the number of elements remaining in the iterator
      * Enumeration - the number of elements remaining in the enumeration

Parameters: object - the object to get the size of, may be null Returns: the size of the specified collection or 0 if the object was null Throws: [IllegalArgumentException](https://docs.oracle.com/javase/7/docs/api/java/lang/IllegalArgumentException.html?is-external=true) - thrown if object is not recognized Since: 3.1

#### sizeIsEmpty public static boolean sizeIsEmpty([Object](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true) object)

* + - Checks if the specified collection/array/iterator is empty.  
      This method can handles objects as follows
      * Collection - via collection isEmpty
      * Map - via map isEmpty
      * Array - using array size
      * Iterator - via hasNext
      * Enumeration - via hasMoreElements

Note: This method is named to avoid clashing with [isEmpty(Collection)](http://docs.google.com/org/apache/commons/collections4/CollectionUtils.html#isEmpty-java.util.Collection-).Parameters: object - the object to get the size of, may be null Returns: true if empty or null Throws: [IllegalArgumentException](https://docs.oracle.com/javase/7/docs/api/java/lang/IllegalArgumentException.html?is-external=true) - thrown if object is not recognized Since: 3.2

#### isEmpty public static boolean isEmpty([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<?> coll) Null-safe check if the specified collection is empty. Null returns true.Parameters: coll - the collection to check, may be null Returns: true if empty or null Since: 3.2

#### isNotEmpty public static boolean isNotEmpty([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<?> coll) Null-safe check if the specified collection is not empty. Null returns false.Parameters: coll - the collection to check, may be null Returns: true if non-null and non-empty Since: 3.2

#### reverseArray public static void reverseArray([Object](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true)[] array) Reverses the order of the given array.Parameters: array - the array to reverse

#### isFull public static boolean isFull([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<? extends [Object](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true)> coll) Returns true if no more elements can be added to the Collection. This method uses the [BoundedCollection](http://docs.google.com/org/apache/commons/collections4/BoundedCollection.html) interface to determine the full status. If the collection does not implement this interface then false is returned. The collection does not have to implement this interface directly. If the collection has been decorated using the decorators subpackage then these will be removed to access the BoundedCollection.Parameters: coll - the collection to check Returns: true if the BoundedCollection is full Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if the collection is null

#### maxSize public static int maxSize([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<? extends [Object](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true)> coll) Get the maximum number of elements that the Collection can contain. This method uses the [BoundedCollection](http://docs.google.com/org/apache/commons/collections4/BoundedCollection.html) interface to determine the maximum size. If the collection does not implement this interface then -1 is returned. The collection does not have to implement this interface directly. If the collection has been decorated using the decorators subpackage then these will be removed to access the BoundedCollection.Parameters: coll - the collection to check Returns: the maximum size of the BoundedCollection, -1 if no maximum size Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if the collection is null

#### collate public static <O extends [Comparable](https://docs.oracle.com/javase/7/docs/api/java/lang/Comparable.html?is-external=true)<? super O>> [List](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true)<O> collate([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends O> a, [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends O> b) Merges two sorted Collections, a and b, into a single, sorted List such that the natural ordering of the elements is retained. Uses the standard O(n) merge algorithm for combining two sorted lists.Type Parameters: O - the element type Parameters: a - the first collection, must not be null b - the second collection, must not be null Returns: a new sorted List, containing the elements of Collection a and b Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if either collection is null Since: 4.0

#### collate public static <O extends [Comparable](https://docs.oracle.com/javase/7/docs/api/java/lang/Comparable.html?is-external=true)<? super O>> [List](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true)<O> collate([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends O> a, [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends O> b, boolean includeDuplicates) Merges two sorted Collections, a and b, into a single, sorted List such that the natural ordering of the elements is retained. Uses the standard O(n) merge algorithm for combining two sorted lists.Type Parameters: O - the element type Parameters: a - the first collection, must not be null b - the second collection, must not be null includeDuplicates - if true duplicate elements will be retained, otherwise they will be removed in the output collection Returns: a new sorted List, containing the elements of Collection a and b Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if either collection is null Since: 4.0

#### collate public static <O> [List](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true)<O> collate([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends O> a, [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends O> b, [Comparator](https://docs.oracle.com/javase/7/docs/api/java/util/Comparator.html?is-external=true)<? super O> c) Merges two sorted Collections, a and b, into a single, sorted List such that the ordering of the elements according to Comparator c is retained. Uses the standard O(n) merge algorithm for combining two sorted lists.Type Parameters: O - the element type Parameters: a - the first collection, must not be null b - the second collection, must not be null c - the comparator to use for the merge. Returns: a new sorted List, containing the elements of Collection a and b Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if either collection or the comparator is null Since: 4.0

#### collate public static <O> [List](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true)<O> collate([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends O> a, [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends O> b, [Comparator](https://docs.oracle.com/javase/7/docs/api/java/util/Comparator.html?is-external=true)<? super O> c, boolean includeDuplicates) Merges two sorted Collections, a and b, into a single, sorted List such that the ordering of the elements according to Comparator c is retained. Uses the standard O(n) merge algorithm for combining two sorted lists.Type Parameters: O - the element type Parameters: a - the first collection, must not be null b - the second collection, must not be null c - the comparator to use for the merge. includeDuplicates - if true duplicate elements will be retained, otherwise they will be removed in the output collection Returns: a new sorted List, containing the elements of Collection a and b Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if either collection or the comparator is null Since: 4.0

#### permutations public static <E> [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<[List](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true)<E>> permutations([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<E> collection) Returns a [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true) of all the permutations of the input collection. NOTE: the number of permutations of a given collection is equal to n!, where n is the size of the collection. Thus, the resulting collection will become **very** large for collections > 10 (e.g. 10! = 3628800, 15! = 1307674368000). For larger collections it is advised to use a [PermutationIterator](http://docs.google.com/org/apache/commons/collections4/iterators/PermutationIterator.html) to iterate over all permutations.Type Parameters: E - the element type Parameters: collection - the collection to create permutations for, may not be null Returns: an unordered collection of all permutations of the input collection Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if collection is null Since: 4.0 See Also: [PermutationIterator](http://docs.google.com/org/apache/commons/collections4/iterators/PermutationIterator.html)

#### retainAll public static <C> [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<C> retainAll([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<C> collection, [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<?> retain) Returns a collection containing all the elements in collection that are also in retain. The cardinality of an element e in the returned collection is the same as the cardinality of e in collection unless retain does not contain e, in which case the cardinality is zero. This method is useful if you do not wish to modify the collection c and thus cannot call c.retainAll(retain);. This implementation iterates over collection, checking each element in turn to see if it's contained in retain. If it's contained, it's added to the returned list. As a consequence, it is advised to use a collection type for retain 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-).Type Parameters: C - the type of object the [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true) contains Parameters: collection - the collection whose contents are the target of the #retailAll operation retain - the collection containing the elements to be retained in the returned collection Returns: a Collection containing all the elements of collection that occur at least once in retain. Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if either parameter is null Since: 3.2

#### retainAll public static <E> [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<E> retainAll([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<E> collection, [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends E> retain, [Equator](http://docs.google.com/org/apache/commons/collections4/Equator.html)<? super E> equator) Returns a collection containing all the elements in collection that are also in retain. The cardinality of an element e in the returned collection is the same as the cardinality of e in collection unless retain does not contain e, in which case the cardinality is zero. This method is useful if you do not wish to modify the collection c and thus cannot call c.retainAll(retain);. Moreover this method uses an [Equator](http://docs.google.com/org/apache/commons/collections4/Equator.html) instead of [Object.equals(Object)](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true#equals-java.lang.Object-) to determine the equality of the elements in collection and retain. Hence this method is useful in cases where the equals behavior of an object needs to be modified without changing the object itself.Type Parameters: E - the type of object the [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true) contains Parameters: collection - the collection whose contents are the target of the retainAll operation retain - the collection containing the elements to be retained in the returned collection equator - the Equator used for testing equality Returns: a Collection containing all the elements of collection that occur at least once in retain according to the equator Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if any of the parameters is null Since: 4.1

#### removeAll public static <E> [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<E> removeAll([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<E> collection, [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<?> remove) Removes the elements in remove from collection. That is, this method returns a collection containing all the elements in c that are not in remove. The cardinality of an element e in the returned collection is the same as the cardinality of e in collection unless remove contains e, in which case the cardinality is zero. This method is useful if you do not wish to modify the collection c and thus cannot call collection.removeAll(remove);. This implementation iterates over collection, checking each element in turn to see if it's contained in remove. If it's not contained, it's added to the returned list. As a consequence, it is advised to use a collection type for remove 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-).Type Parameters: E - the type of object the [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true) contains Parameters: collection - the collection from which items are removed (in the returned collection) remove - the items to be removed from the returned collection Returns: a Collection containing all the elements of collection except any elements that also occur in remove. Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if either parameter is null Since: 4.0 (method existed in 3.2 but was completely broken)

#### removeAll public static <E> [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<E> removeAll([Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<E> collection, [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<? extends E> remove, [Equator](http://docs.google.com/org/apache/commons/collections4/Equator.html)<? super E> equator) Removes all elements in remove from collection. That is, this method returns a collection containing all the elements in collection that are not in remove. The cardinality of an element e in the returned collection is the same as the cardinality of e in collection unless remove contains e, in which case the cardinality is zero. This method is useful if you do not wish to modify the collection c and thus cannot call collection.removeAll(remove). Moreover this method uses an [Equator](http://docs.google.com/org/apache/commons/collections4/Equator.html) instead of [Object.equals(Object)](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true#equals-java.lang.Object-) to determine the equality of the elements in collection and remove. Hence this method is useful in cases where the equals behavior of an object needs to be modified without changing the object itself.Type Parameters: E - the type of object the [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true) contains Parameters: collection - the collection from which items are removed (in the returned collection) remove - the items to be removed from the returned collection equator - the Equator used for testing equality Returns: a Collection containing all the elements of collection except any element that if equal according to the equator Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if any of the parameters is null Since: 4.1

#### synchronizedCollection [@Deprecated](https://docs.oracle.com/javase/7/docs/api/java/lang/Deprecated.html?is-external=true) public static <C> [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<C> synchronizedCollection([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<C> collection) Deprecated. since 4.1, use [Collections.synchronizedCollection(Collection)](https://docs.oracle.com/javase/7/docs/api/java/util/Collections.html?is-external=true#synchronizedCollection-java.util.Collection-) instead Returns a synchronized collection backed by the given collection. You must manually synchronize on the returned buffer's iterator to avoid non-deterministic behavior: Collection c = CollectionUtils.synchronizedCollection(myCollection); synchronized (c) { Iterator i = c.iterator(); while (i.hasNext()) { process (i.next()); } } This method uses the implementation in the decorators subpackage.Type Parameters: C - the type of object the [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true) contains Parameters: collection - the collection to synchronize, must not be null Returns: a synchronized collection backed by the given collection Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if the collection is null

#### unmodifiableCollection [@Deprecated](https://docs.oracle.com/javase/7/docs/api/java/lang/Deprecated.html?is-external=true) public static <C> [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<C> unmodifiableCollection([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<? extends C> collection) Deprecated. since 4.1, use [Collections.unmodifiableCollection(Collection)](https://docs.oracle.com/javase/7/docs/api/java/util/Collections.html?is-external=true#unmodifiableCollection-java.util.Collection-) instead Returns an unmodifiable collection backed by the given collection. This method uses the implementation in the decorators subpackage.Type Parameters: C - the type of object the [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true) contains Parameters: collection - the collection to make unmodifiable, must not be null Returns: an unmodifiable collection backed by the given collection Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if the collection is null

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

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

#### extractSingleton public static <E> E extractSingleton([Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<E> collection) Extract the lone element of the specified Collection.Type Parameters: E - collection type Parameters: collection - to read Returns: sole member of collection Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if collection is null [IllegalArgumentException](https://docs.oracle.com/javase/7/docs/api/java/lang/IllegalArgumentException.html?is-external=true) - if collection is empty or contains more than one element Since: 4.0

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