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Package org.apache.commons.collections4.functors

This package contains implementations of the [Closure](http://docs.google.com/org/apache/commons/collections4/Closure.html), [Predicate](http://docs.google.com/org/apache/commons/collections4/Predicate.html), [Transformer](http://docs.google.com/org/apache/commons/collections4/Transformer.html) and [Factory](http://docs.google.com/org/apache/commons/collections4/Factory.html) interfaces.

See: [Description](#3znysh7)

* Interface Summary

|  |  |
| --- | --- |
| * Interface | * Description |
| * [PredicateDecorator](http://docs.google.com/org/apache/commons/collections4/functors/PredicateDecorator.html)<T> | * Defines a predicate that decorates one or more other predicates. |

* Class Summary

|  |  |
| --- | --- |
| * Class | * Description |
| * [AbstractQuantifierPredicate](http://docs.google.com/org/apache/commons/collections4/functors/AbstractQuantifierPredicate.html)<T> | * Abstract base class for quantification predicates, e.g. |
| * [AllPredicate](http://docs.google.com/org/apache/commons/collections4/functors/AllPredicate.html)<T> | * Predicate implementation that returns true if all the predicates return true. |
| * [AndPredicate](http://docs.google.com/org/apache/commons/collections4/functors/AndPredicate.html)<T> | * Predicate implementation that returns true if both the predicates return true. |
| * [AnyPredicate](http://docs.google.com/org/apache/commons/collections4/functors/AnyPredicate.html)<T> | * Predicate implementation that returns true if any of the predicates return true. |
| * [CatchAndRethrowClosure](http://docs.google.com/org/apache/commons/collections4/functors/CatchAndRethrowClosure.html)<E> | * [Closure](http://docs.google.com/org/apache/commons/collections4/Closure.html) that catches any checked exception and re-throws it as a [FunctorException](http://docs.google.com/org/apache/commons/collections4/FunctorException.html) runtime exception. |
| * [ChainedClosure](http://docs.google.com/org/apache/commons/collections4/functors/ChainedClosure.html)<E> | * Closure implementation that chains the specified closures together. |
| * [ChainedTransformer](http://docs.google.com/org/apache/commons/collections4/functors/ChainedTransformer.html)<T> | * Transformer implementation that chains the specified transformers together. |
| * [CloneTransformer](http://docs.google.com/org/apache/commons/collections4/functors/CloneTransformer.html)<T> | * Transformer implementation that returns a clone of the input object. |
| * [ClosureTransformer](http://docs.google.com/org/apache/commons/collections4/functors/ClosureTransformer.html)<T> | * Transformer implementation that calls a Closure using the input object and then returns the input. |
| * [ComparatorPredicate](http://docs.google.com/org/apache/commons/collections4/functors/ComparatorPredicate.html)<T> | * Predicate that compares the input object with the one stored in the predicate using a comparator. |
| * [ConstantFactory](http://docs.google.com/org/apache/commons/collections4/functors/ConstantFactory.html)<T> | * Factory implementation that returns the same constant each time. |
| * [ConstantTransformer](http://docs.google.com/org/apache/commons/collections4/functors/ConstantTransformer.html)<I,O> | * Transformer implementation that returns the same constant each time. |
| * [DefaultEquator](http://docs.google.com/org/apache/commons/collections4/functors/DefaultEquator.html)<T> | * Default [Equator](http://docs.google.com/org/apache/commons/collections4/Equator.html) implementation. |
| * [EqualPredicate](http://docs.google.com/org/apache/commons/collections4/functors/EqualPredicate.html)<T> | * Predicate implementation that returns true if the input is the same object as the one stored in this predicate by equals. |
| * [ExceptionClosure](http://docs.google.com/org/apache/commons/collections4/functors/ExceptionClosure.html)<E> | * Closure implementation that always throws an exception. |
| * [ExceptionFactory](http://docs.google.com/org/apache/commons/collections4/functors/ExceptionFactory.html)<T> | * Factory implementation that always throws an exception. |
| * [ExceptionPredicate](http://docs.google.com/org/apache/commons/collections4/functors/ExceptionPredicate.html)<T> | * Predicate implementation that always throws an exception. |
| * [ExceptionTransformer](http://docs.google.com/org/apache/commons/collections4/functors/ExceptionTransformer.html)<I,O> | * Transformer implementation that always throws an exception. |
| * [FactoryTransformer](http://docs.google.com/org/apache/commons/collections4/functors/FactoryTransformer.html)<I,O> | * Transformer implementation that calls a Factory and returns the result. |
| * [FalsePredicate](http://docs.google.com/org/apache/commons/collections4/functors/FalsePredicate.html)<T> | * Predicate implementation that always returns false. |
| * [ForClosure](http://docs.google.com/org/apache/commons/collections4/functors/ForClosure.html)<E> | * Closure implementation that calls another closure n times, like a for loop. |
| * [IdentityPredicate](http://docs.google.com/org/apache/commons/collections4/functors/IdentityPredicate.html)<T> | * Predicate implementation that returns true if the input is the same object as the one stored in this predicate. |
| * [IfClosure](http://docs.google.com/org/apache/commons/collections4/functors/IfClosure.html)<E> | * Closure implementation acts as an if statement calling one or other closure based on a predicate. |
| * [IfTransformer](http://docs.google.com/org/apache/commons/collections4/functors/IfTransformer.html)<I,O> | * Transformer implementation that will call one of two closures based on whether a predicate evaluates as true or false. |
| * [InstanceofPredicate](http://docs.google.com/org/apache/commons/collections4/functors/InstanceofPredicate.html) | * Predicate implementation that returns true if the input is an instanceof the type stored in this predicate. |
| * [InstantiateFactory](http://docs.google.com/org/apache/commons/collections4/functors/InstantiateFactory.html)<T> | * Factory implementation that creates a new object instance by reflection. |
| * [InstantiateTransformer](http://docs.google.com/org/apache/commons/collections4/functors/InstantiateTransformer.html)<T> | * Transformer implementation that creates a new object instance by reflection. |
| * [InvokerTransformer](http://docs.google.com/org/apache/commons/collections4/functors/InvokerTransformer.html)<I,O> | * Transformer implementation that creates a new object instance by reflection. |
| * [MapTransformer](http://docs.google.com/org/apache/commons/collections4/functors/MapTransformer.html)<I,O> | * Transformer implementation that returns the value held in a specified map using the input parameter as a key. |
| * [NonePredicate](http://docs.google.com/org/apache/commons/collections4/functors/NonePredicate.html)<T> | * Predicate implementation that returns true if none of the predicates return true. |
| * [NOPClosure](http://docs.google.com/org/apache/commons/collections4/functors/NOPClosure.html)<E> | * Closure implementation that does nothing. |
| * [NOPTransformer](http://docs.google.com/org/apache/commons/collections4/functors/NOPTransformer.html)<T> | * Transformer implementation that does nothing. |
| * [NotNullPredicate](http://docs.google.com/org/apache/commons/collections4/functors/NotNullPredicate.html)<T> | * Predicate implementation that returns true if the input is not null. |
| * [NotPredicate](http://docs.google.com/org/apache/commons/collections4/functors/NotPredicate.html)<T> | * Predicate implementation that returns the opposite of the decorated predicate. |
| * [NullIsExceptionPredicate](http://docs.google.com/org/apache/commons/collections4/functors/NullIsExceptionPredicate.html)<T> | * Predicate implementation that throws an exception if the input is null. |
| * [NullIsFalsePredicate](http://docs.google.com/org/apache/commons/collections4/functors/NullIsFalsePredicate.html)<T> | * Predicate implementation that returns false if the input is null. |
| * [NullIsTruePredicate](http://docs.google.com/org/apache/commons/collections4/functors/NullIsTruePredicate.html)<T> | * Predicate implementation that returns true if the input is null. |
| * [NullPredicate](http://docs.google.com/org/apache/commons/collections4/functors/NullPredicate.html)<T> | * Predicate implementation that returns true if the input is null. |
| * [OnePredicate](http://docs.google.com/org/apache/commons/collections4/functors/OnePredicate.html)<T> | * Predicate implementation that returns true if only one of the predicates return true. |
| * [OrPredicate](http://docs.google.com/org/apache/commons/collections4/functors/OrPredicate.html)<T> | * Predicate implementation that returns true if either of the predicates return true. |
| * [PredicateTransformer](http://docs.google.com/org/apache/commons/collections4/functors/PredicateTransformer.html)<T> | * Transformer implementation that calls a Predicate using the input object and then returns the result. |
| * [PrototypeFactory](http://docs.google.com/org/apache/commons/collections4/functors/PrototypeFactory.html) | * Factory implementation that creates a new instance each time based on a prototype. |
| * [StringValueTransformer](http://docs.google.com/org/apache/commons/collections4/functors/StringValueTransformer.html)<T> | * Transformer implementation that returns the result of calling String.valueOf on the input object. |
| * [SwitchClosure](http://docs.google.com/org/apache/commons/collections4/functors/SwitchClosure.html)<E> | * Closure implementation calls the closure whose predicate returns true, like a switch statement. |
| * [SwitchTransformer](http://docs.google.com/org/apache/commons/collections4/functors/SwitchTransformer.html)<I,O> | * Transformer implementation calls the transformer whose predicate returns true, like a switch statement. |
| * [TransformedPredicate](http://docs.google.com/org/apache/commons/collections4/functors/TransformedPredicate.html)<T> | * Predicate implementation that transforms the given object before invoking another Predicate. |
| * [TransformerClosure](http://docs.google.com/org/apache/commons/collections4/functors/TransformerClosure.html)<E> | * Closure implementation that calls a Transformer using the input object and ignore the result. |
| * [TransformerPredicate](http://docs.google.com/org/apache/commons/collections4/functors/TransformerPredicate.html)<T> | * Predicate implementation that returns the result of a transformer. |
| * [TruePredicate](http://docs.google.com/org/apache/commons/collections4/functors/TruePredicate.html)<T> | * Predicate implementation that always returns true. |
| * [UniquePredicate](http://docs.google.com/org/apache/commons/collections4/functors/UniquePredicate.html)<T> | * Predicate implementation that returns true the first time an object is passed into the predicate. |
| * [WhileClosure](http://docs.google.com/org/apache/commons/collections4/functors/WhileClosure.html)<E> | * Closure implementation that executes a closure repeatedly until a condition is met, like a do-while or while loop. |

* Enum Summary

|  |  |
| --- | --- |
| * Enum | * Description |
| * [ComparatorPredicate.Criterion](http://docs.google.com/org/apache/commons/collections4/functors/ComparatorPredicate.Criterion.html) |  |

## Package org.apache.commons.collections4.functors Description

This package contains implementations of the [Closure](http://docs.google.com/org/apache/commons/collections4/Closure.html), [Predicate](http://docs.google.com/org/apache/commons/collections4/Predicate.html), [Transformer](http://docs.google.com/org/apache/commons/collections4/Transformer.html) and [Factory](http://docs.google.com/org/apache/commons/collections4/Factory.html) interfaces. These provide simple callbacks for processing with collections.

**WARNING:** from v4.1 onwards several unsafe classes in this package will not be serializable anymore in order to prevent potential remote code execution exploits.

Classes considered to be unsafe are:

* CloneTransformer
* ForClosure
* InstantiateFactory
* InstantiateTransformer
* InvokerTransformer
* PrototypeFactory$PrototypeCloneFactory
* PrototypeFactory$PrototypeSerializationFactory
* WhileClosure

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