

# Package ‘checkmate’

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**Type** Package

**Title** Fast and Versatile Argument Checks

**Description** Tests and assertions to perform frequent argument checks. A substantial part of the package was written in C to minimize any worries about execution time overhead.

**Version** 1.9.3

**URL** <https://github.com/mllg/checkmate>

**URLNote** <https://github.com/mllg/checkmate>

**BugReports** <https://github.com/mllg/checkmate/issues>

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**ByteCompile** yes

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**License** BSD\_3\_clause + file LICENSE

**VignetteBuilder** knitr

**RoxygenNote** 6.1.1

**Collate** 'AssertCollection.R' 'allMissing.R' 'anyInfinite.R'  
'anyMissing.R' 'anyNaN.R' 'asInteger.R' 'assert.R' 'helper.R'  
'makeExpectation.R' 'makeTest.R' 'makeAssertion.R'  
'checkAccess.R' 'checkArray.R' 'checkAtomic.R'  
'checkAtomicVector.R' 'checkBit.R' 'checkCharacter.R'  
'checkChoice.R' 'checkClass.R' 'checkComplex.R' 'checkCount.R'  
'checkDataFrame.R' 'checkDataTable.R' 'checkDate.R'  
'checkDirectoryExists.R' 'checkDisjunct.R' 'checkDouble.R'  
'checkEnvironment.R' 'checkFALSE.R' 'checkFactor.R'  
'checkFileExists.R' 'checkFlag.R' 'checkFormula.R'

'checkFunction.R' 'checkInt.R' 'checkInteger.R'  
 'checkIntegerish.R' 'checkList.R' 'checkLogical.R'  
 'checkMatrix.R' 'checkMultiClass.R' 'checkNamed.R'  
 'checkNames.R' 'checkNull.R' 'checkNumber.R' 'checkNumeric.R'  
 'checkOS.R' 'checkPOSIXct.R' 'checkPathForOutput.R' 'checkR6.R'  
 'checkRaw.R' 'checkScalar.R' 'checkScalarNA.R'  
 'checkSetEqual.R' 'checkString.R' 'checkSubset.R' 'checkTRUE.R'  
 'checkTibble.R' 'checkVector.R' 'coalesce.R' 'isIntegerish.R'  
 'matchArg.R' 'qassert.R' 'qassertr.R' 'vname.R' 'wfwl.R'  
 'zzz.R'

**Author** Michel Lang [cre, aut] (<<https://orcid.org/0000-0001-9754-0393>>),  
 Bernd Bischl [ctb]

**Maintainer** Michel Lang <michellang@gmail.com>

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checkmate-package      *checkmate: Fast and Versatile Argument Checks*

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**Description**

Tests and assertions to perform frequent argument checks. A substantial part of the package was written in C to minimize any worries about execution time overhead.

**Check scalars**

- [checkFlag](#)
- [checkCount](#)
- [checkNumber](#)
- [checkInt](#)
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**Check vectors**

- [checkLogical](#)
- [checkNumeric](#)
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**Check attributes**

- [checkClass](#)
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- [checkArray](#)
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### **Check other built-in R types**

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### **Check sets**

- [checkChoice](#)
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- [checkSetEqual](#)
- [checkDisjunct](#)

### **File IO**

- [checkFileExists](#)
- [checkDirectoryExists](#)
- [checkPathForOutput](#)
- [checkAccess](#)

### **Popular data types of third party packages**

- [checkBit](#)
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- [checkR6](#)
- [checkTibble](#)

### **Safe coercion to integer**

- [asCount](#)
- [asInt](#)
- [asInteger](#)

### **Quick argument checks using a DSL**

- [qassert](#)
- [qassertr](#)

**Misc**

- [checkOS](#) (check operating system)
- [assert](#) (combine multiple checks into an assertion)
- [anyMissing](#)
- [allMissing](#)
- [anyNaN](#)
- [wf](#) (which.first and which.last)

**Author(s)**

**Maintainer:** Michel Lang <michellang@gmail.com> (0000-0001-9754-0393)

Other contributors:

- Bernd Bischl <bernd\_bischl@gmx.de> [contributor]

**See Also**

Useful links:

- <https://github.com/mlg/checkmate>
- Report bugs at <https://github.com/mlg/checkmate/issues>

---

allMissing

*Check if an object contains missing values*

---

**Description**

Supported are atomic types (see [is.atomic](#)), lists and data frames. Missingness is defined as NA or NaN for atomic types and data frame columns, NULL is defined as missing for lists.

`allMissing` applied to a `data.frame` returns TRUE if at least one column has only non-missing values. If you want to perform the less frequent check that there is not a single non-missing observation present in the `data.frame`, use `all(sapply(df, allMissing))` instead.

**Usage**

```
allMissing(x)
```

```
anyMissing(x)
```

**Arguments**

x [ANY]  
Object to check.

**Value**

logical(1) Returns TRUE if any (anyMissing) or all (allMissing) elements of x are missing (see details), FALSE otherwise.

**Examples**

```
allMissing(1:2)
allMissing(c(1, NA))
allMissing(c(NA, NA))
x = data.frame(a = 1:2, b = NA)
# Note how allMissing combines the results for data frames:
allMissing(x)
all(sapply(x, allMissing))
anyMissing(c(1, 1))
anyMissing(c(1, NA))
anyMissing(list(1, NULL))

x = iris
x[, "Species"] = NA
anyMissing(x)
allMissing(x)
```

---

anyInfinite

*Check if an object contains infinite values*


---

**Description**

Supported are atomic types (see [is.atomic](#)), lists and data frames.

**Usage**

```
anyInfinite(x)
```

**Arguments**

x [ANY]  
Object to check.

**Value**

logical(1) Returns TRUE if any element is -Inf or Inf.

**Examples**

```
anyInfinite(1:10)
anyInfinite(c(1:10, Inf))
iris[3, 3] = Inf
anyInfinite(iris)
```

---

anyNaN	<i>Check if an object contains NaN values</i>
--------	---

---

### Description

Supported are atomic types (see [is.atomic](#)), lists and data frames.

### Usage

```
anyNaN(x)
```

### Arguments

x	[ANY] Object to check.
---	---------------------------

### Value

logical(1) Returns TRUE if any element is NaN.

### Examples

```
anyNaN(1:10)
anyNaN(c(1:10, NaN))
iris[3, 3] = NaN
anyNaN(iris)
```

---

asInteger	<i>Convert an argument to an integer</i>
-----------	--

---

### Description

asInteger is intended to be used for vectors while asInt is a specialization for scalar integers and asCount for scalar non-negative integers. Convertible are (a) atomic vectors with all elements NA and (b) double vectors with all elements being within tol range of an integer.

Note that these functions may be deprecated in the future. Instead, it is advised to use [assertCount](#), [assertInt](#) or [assertIntegerish](#) with argument coerce set to TRUE instead.



**Usage**

```
asInteger(x, tol = sqrt(.Machine$double.eps), lower = -Inf,
  upper = Inf, any.missing = TRUE, all.missing = TRUE, len = NULL,
  min.len = NULL, max.len = NULL, unique = FALSE, sorted = FALSE,
  names = NULL, .var.name = vname(x))
```

```
asCount(x, na.ok = FALSE, positive = FALSE,
  tol = sqrt(.Machine$double.eps), .var.name = vname(x))
```

```
asInt(x, na.ok = FALSE, lower = -Inf, upper = Inf,
  tol = sqrt(.Machine$double.eps), .var.name = vname(x))
```

**Arguments**

x	[any] Object to convert.
tol	[double(1)] Numerical tolerance used to check whether a double or complex can be converted. Default is <code>sqrt(.Machine\$double.eps)</code> .
lower	[numeric(1)] Lower value all elements of x must be greater than or equal to.
upper	[numeric(1)] Upper value all elements of x must be lower than or equal to.
any.missing	[logical(1)] Are vectors with missing values allowed? Default is TRUE.
all.missing	[logical(1)] Are vectors with only missing values allowed? Default is TRUE.
len	[integer(1)] Exact expected length of x.
min.len	[integer(1)] Minimal length of x.
max.len	[integer(1)] Maximal length of x.
unique	[logical(1)] Must all values be unique? Default is FALSE.
sorted	[logical(1)] Elements must be sorted in ascending order. Missing values are ignored.
names	[character(1)] Check for names. See <a href="#">checkNamed</a> for possible values. Default is “any” which performs no check at all. Note that you can use <a href="#">checkSubset</a> to check for a specific set of names.
.var.name	[character(1)] Name of the checked object to print in error messages. Defaults to the heuristic implemented in <a href="#">vname</a> .

na.ok	[logical(1)] Are missing values allowed? Default is FALSE.
positive	[logical(1)] Must x be positive ( $\geq 1$ )? Default is FALSE.

**Details**

This function does not distinguish between NA, NA\_integer\_, NA\_real\_, NA\_complex\_, NA\_character\_ and NaN.

**Value**

Converted x.

**Examples**

```
asInteger(c(1, 2, 3))
asCount(1)
asInt(1)
```

---

assert

*Combine multiple checks into one assertion*

---

**Description**

You can call this function with an arbitrary number of check\* functions, i.e. functions provided by this package or your own functions which return TRUE on success and the error message as character(1) otherwise. The resulting assertion is successful, if combine is “or” (default) and at least one check evaluates to TRUE or combine is “and” and all checks evaluate to TRUE. Otherwise, assert throws an informative error message.

**Usage**

```
assert(..., combine = "or", .var.name = NULL)
```

**Arguments**

...	[any] List of calls to check functions.
combine	[character(1)] “or” or “and” to combine the check functions with an OR or AND, respectively.
.var.name	[character(1)] Name of the checked object to print in error messages. Defaults to the heuristic implemented in <a href="#">vname</a> .

**Value**

Throws an error if all checks fail and invisibly returns TRUE otherwise.

**Examples**

```
x = 1:10
assert(checkNull(x), checkInteger(x, any.missing = FALSE))
## Not run:
x = 1
assert(checkChoice(x, c("a", "b")), checkDataFrame(x))

## End(Not run)
```

---

AssertCollection	<i>Collect multiple assertions</i>
------------------	------------------------------------

---

**Description**

The function `makeAssertCollection()` returns a simple stack-like closure you can pass to all functions of the `assert*`-family. All messages get collected and can be reported with `reportAssertions()`. Alternatively, you can easily write your own report function or customize the the output of the report function to a certain degree. See the example on how to push custom messages or retrieve all stored messages.

**Usage**

```
makeAssertCollection()

reportAssertions(collection)
```

**Arguments**

```
collection      [AssertCollection]
                 Object of type "AssertCollection" (constructed via makeAssertCollection).
```

**Value**

`makeAssertCollection()` returns an object of class "AssertCollection" and `reportCollection` returns invisibly TRUE if no error is thrown (i.e., no message was collected).

**Examples**

```
x = "a"
coll = makeAssertCollection()

print(coll$isEmpty())
assertNumeric(x, add = coll)
coll$isEmpty()
coll$push("Custom error message")
coll$getMessages()
## Not run:
  reportAssertions(coll)

## End(Not run)
```

---

checkAccess	<i>Check file system access rights</i>
-------------	--

---

### Description

Check file system access rights

### Usage

```
checkAccess(x, access = "")
```

```
check_access(x, access = "")
```

```
assertAccess(x, access = "", .var.name = vname(x), add = NULL)
```

```
assert_access(x, access = "", .var.name = vname(x), add = NULL)
```

```
testAccess(x, access = "")
```

```
test_access(x, access = "")
```

```
expect_access(x, access = "", info = NULL, label = vname(x))
```

### Arguments

x	[any] Object to check.
access	[character(1)] Single string containing possible characters 'r', 'w' and 'x' to force a check for read, write or execute access rights, respectively. Write and executable rights are not checked on Windows.
.var.name	[character(1)] Name of the checked object to print in assertions. Defaults to the heuristic implemented in <a href="#">vname</a> .
add	[AssertCollection] Collection to store assertion messages. See <a href="#">AssertCollection</a> .
info	[character(1)] Extra information to be included in the message for the testthat reporter. See <a href="#">expect_that</a> .
label	[character(1)] Name of the checked object to print in messages. Defaults to the heuristic implemented in <a href="#">vname</a> .

**Value**

Depending on the function prefix: If the check is successful, the functions `assertAccess/assert_access` return `x` invisibly, whereas `checkAccess/check_access` and `testAccess/test_access` return `TRUE`. If the check is not successful, `assertAccess/assert_access` throws an error message, `testAccess/test_access` returns `FALSE`, and `checkAccess` returns a string with the error message. The function `expect_access` always returns an [expectation](#).

**See Also**

Other filesystem: [checkDirectoryExists](#), [checkFileExists](#), [checkPathForOutput](#)

**Examples**

```
# Is R's home directory readable?
testAccess(R.home(), "r")

# Is R's home directory writeable?
testAccess(R.home(), "w")
```

---

checkArray	<i>Check if an argument is an array</i>
------------	---

---

**Description**

Check if an argument is an array

**Usage**

```
checkArray(x, mode = NULL, any.missing = TRUE, d = NULL,
  min.d = NULL, max.d = NULL, null.ok = FALSE)

check_array(x, mode = NULL, any.missing = TRUE, d = NULL,
  min.d = NULL, max.d = NULL, null.ok = FALSE)

assertArray(x, mode = NULL, any.missing = TRUE, d = NULL,
  min.d = NULL, max.d = NULL, null.ok = FALSE,
  .var.name = vname(x), add = NULL)

assert_array(x, mode = NULL, any.missing = TRUE, d = NULL,
  min.d = NULL, max.d = NULL, null.ok = FALSE,
  .var.name = vname(x), add = NULL)

testArray(x, mode = NULL, any.missing = TRUE, d = NULL,
  min.d = NULL, max.d = NULL, null.ok = FALSE)

test_array(x, mode = NULL, any.missing = TRUE, d = NULL,
  min.d = NULL, max.d = NULL, null.ok = FALSE)
```

```
expect_array(x, mode = NULL, any.missing = TRUE, d = NULL,
  min.d = NULL, max.d = NULL, null.ok = FALSE, info = NULL,
  label = vname(x))
```

### Arguments

x	[any] Object to check.
mode	[character(1)] Storage mode of the array. Arrays can hold vectors, i.e. “logical”, “integer”, “integerish”, “double”, “numeric”, “complex”, “character” and “list”. You can also specify “atomic” here to explicitly prohibit lists. Default is NULL (no check).
any.missing	[logical(1)] Are missing values allowed? Default is TRUE.
d	[integer(1)] Exact number of dimensions of array x. Default is NULL (no check).
min.d	[integer(1)] Minimum number of dimensions of array x. Default is NULL (no check).
max.d	[integer(1)] Maximum number of dimensions of array x. Default is NULL (no check).
null.ok	[logical(1)] If set to TRUE, x may also be NULL. In this case only a type check of x is performed, all additional checks are disabled.
.var.name	[character(1)] Name of the checked object to print in assertions. Defaults to the heuristic implemented in <a href="#">vname</a> .
add	[AssertCollection] Collection to store assertion messages. See <a href="#">AssertCollection</a> .
info	[character(1)] Extra information to be included in the message for the testthat reporter. See <a href="#">expect_that</a> .
label	[character(1)] Name of the checked object to print in messages. Defaults to the heuristic implemented in <a href="#">vname</a> .

### Value

Depending on the function prefix: If the check is successful, the functions `assertArray/assert_array` return x invisibly, whereas `checkArray/check_array` and `testArray/test_array` return TRUE. If the check is not successful, `assertArray/assert_array` throws an error message, `testArray/test_array` returns FALSE, and `checkArray` returns a string with the error message. The function `expect_array` always returns an [expectation](#).

**See Also**

Other basetypes: [checkAtomicVector](#), [checkAtomic](#), [checkCharacter](#), [checkComplex](#), [checkDataFrame](#), [checkDate](#), [checkDouble](#), [checkEnvironment](#), [checkFactor](#), [checkFormula](#), [checkFunction](#), [checkIntegerish](#), [checkInteger](#), [checkList](#), [checkLogical](#), [checkMatrix](#), [checkNull](#), [checkNumeric](#), [checkPOSIXct](#), [checkRaw](#), [checkVector](#)

Other compound: [checkDataFrame](#), [checkDataTable](#), [checkMatrix](#), [checkTibble](#)

**Examples**

```
checkArray(array(1:27, dim = c(3, 3, 3)), d = 3)
```

---

checkAtomic	<i>Check that an argument is an atomic vector</i>
-------------	---

---

**Description**

For the definition of “atomic”, see [is.atomic](#).

**Usage**

```
checkAtomic(x, any.missing = TRUE, all.missing = TRUE, len = NULL,
  min.len = NULL, max.len = NULL, unique = FALSE, names = NULL)
```

```
check_atomic(x, any.missing = TRUE, all.missing = TRUE, len = NULL,
  min.len = NULL, max.len = NULL, unique = FALSE, names = NULL)
```

```
assertAtomic(x, any.missing = TRUE, all.missing = TRUE, len = NULL,
  min.len = NULL, max.len = NULL, unique = FALSE, names = NULL,
  .var.name = vname(x), add = NULL)
```

```
assert_atomic(x, any.missing = TRUE, all.missing = TRUE, len = NULL,
  min.len = NULL, max.len = NULL, unique = FALSE, names = NULL,
  .var.name = vname(x), add = NULL)
```

```
testAtomic(x, any.missing = TRUE, all.missing = TRUE, len = NULL,
  min.len = NULL, max.len = NULL, unique = FALSE, names = NULL)
```

```
test_atomic(x, any.missing = TRUE, all.missing = TRUE, len = NULL,
  min.len = NULL, max.len = NULL, unique = FALSE, names = NULL)
```

```
expect_atomic(x, any.missing = TRUE, all.missing = TRUE, len = NULL,
  min.len = NULL, max.len = NULL, unique = FALSE, names = NULL,
  info = NULL, label = vname(x))
```

**Arguments**

x	[any] Object to check.
any.missing	[logical(1)] Are vectors with missing values allowed? Default is TRUE.
all.missing	[logical(1)] Are vectors with only missing values allowed? Default is TRUE.
len	[integer(1)] Exact expected length of x.
min.len	[integer(1)] Minimal length of x.
max.len	[integer(1)] Maximal length of x.
unique	[logical(1)] Must all values be unique? Default is FALSE.
names	[character(1)] Check for names. See <a href="#">checkNamed</a> for possible values. Default is “any” which performs no check at all. Note that you can use <a href="#">checkSubset</a> to check for a specific set of names.
.var.name	[character(1)] Name of the checked object to print in assertions. Defaults to the heuristic implemented in <a href="#">vname</a> .
add	[AssertCollection] Collection to store assertion messages. See <a href="#">AssertCollection</a> .
info	[character(1)] Extra information to be included in the message for the testthat reporter. See <a href="#">expect_that</a> .
label	[character(1)] Name of the checked object to print in messages. Defaults to the heuristic implemented in <a href="#">vname</a> .

**Value**

Depending on the function prefix: If the check is successful, the functions `assertAtomic/assert_atomic` return `x` invisibly, whereas `checkAtomic/check_atomic` and `testAtomic/test_atomic` return `TRUE`. If the check is not successful, `assertAtomic/assert_atomic` throws an error message, `testAtomic/test_atomic` returns `FALSE`, and `checkAtomic` returns a string with the error message. The function `expect_atomic` always returns an [expectation](#).

**See Also**

Other basetypes: [checkArray](#), [checkAtomicVector](#), [checkCharacter](#), [checkComplex](#), [checkDataFrame](#), [checkDate](#), [checkDouble](#), [checkEnvironment](#), [checkFactor](#), [checkFormula](#), [checkFunction](#), [checkIntegerish](#), [checkInteger](#), [checkList](#), [checkLogical](#), [checkMatrix](#), [checkNull](#), [checkNumeric](#), [checkPOSIXct](#), [checkRaw](#), [checkVector](#)

Other atomicvector: [checkAtomicVector](#), [checkVector](#)



**Examples**

```
testAtomic(letters, min.len = 1L, any.missing = FALSE)
```

---

checkAtomicVector	<i>Check that an argument is an atomic vector</i>
-------------------	---

---

**Description**

An atomic vector is defined slightly different from specifications in `is.atomic` and `is.vector`: An atomic vector is either logical, integer, numeric, complex, character or raw and can have any attributes except a dimension attribute (like matrices). I.e., a factor is an atomic vector, but a matrix or NULL are not. In short, this is basically equivalent to `is.atomic(x) && !is.null(x) && is.null(dim(x))`.

**Usage**

```
checkAtomicVector(x, any.missing = TRUE, all.missing = TRUE,
  len = NULL, min.len = NULL, max.len = NULL, unique = FALSE,
  names = NULL)
```

```
check_atomic_vector(x, any.missing = TRUE, all.missing = TRUE,
  len = NULL, min.len = NULL, max.len = NULL, unique = FALSE,
  names = NULL)
```

```
assertAtomicVector(x, any.missing = TRUE, all.missing = TRUE,
  len = NULL, min.len = NULL, max.len = NULL, unique = FALSE,
  names = NULL, .var.name = vname(x), add = NULL)
```

```
assert_atomic_vector(x, any.missing = TRUE, all.missing = TRUE,
  len = NULL, min.len = NULL, max.len = NULL, unique = FALSE,
  names = NULL, .var.name = vname(x), add = NULL)
```

```
testAtomicVector(x, any.missing = TRUE, all.missing = TRUE,
  len = NULL, min.len = NULL, max.len = NULL, unique = FALSE,
  names = NULL)
```

```
test_atomic_vector(x, any.missing = TRUE, all.missing = TRUE,
  len = NULL, min.len = NULL, max.len = NULL, unique = FALSE,
  names = NULL)
```

```
expect_atomic_vector(x, any.missing = TRUE, all.missing = TRUE,
  len = NULL, min.len = NULL, max.len = NULL, unique = FALSE,
  names = NULL, info = NULL, label = vname(x))
```

**Arguments**

x	[any] Object to check.
---	---------------------------

any.missing	[logical(1)] Are vectors with missing values allowed? Default is TRUE.
all.missing	[logical(1)] Are vectors with only missing values allowed? Default is TRUE.
len	[integer(1)] Exact expected length of x.
min.len	[integer(1)] Minimal length of x.
max.len	[integer(1)] Maximal length of x.
unique	[logical(1)] Must all values be unique? Default is FALSE.
names	[character(1)] Check for names. See <a href="#">checkNamed</a> for possible values. Default is “any” which performs no check at all.
.var.name	[character(1)] Name of the checked object to print in assertions. Defaults to the heuristic implemented in <a href="#">vname</a> .
add	[AssertCollection] Collection to store assertion messages. See <a href="#">AssertCollection</a> .
info	[character(1)] Extra information to be included in the message for the testthat reporter. See <a href="#">expect_that</a> .
label	[character(1)] Name of the checked object to print in messages. Defaults to the heuristic implemented in <a href="#">vname</a> .

### Value

Depending on the function prefix: If the check is successful, the functions `assertAtomicVector/assert_atomic_vector` return `x` invisibly, whereas `checkAtomicVector/check_atomic_vector` and `testAtomicVector/test_atomic_vector` return `TRUE`. If the check is not successful, `assertAtomicVector/assert_atomic_vector` throws an error message, `testAtomicVector/test_atomic_vector` returns `FALSE`, and `checkAtomicVector` returns a string with the error message. The function `expect_atomic_vector` always returns an [expectation](#).

### See Also

Other basetypes: [checkArray](#), [checkAtomic](#), [checkCharacter](#), [checkComplex](#), [checkDataFrame](#), [checkDate](#), [checkDouble](#), [checkEnvironment](#), [checkFactor](#), [checkFormula](#), [checkFunction](#), [checkIntegerish](#), [checkInteger](#), [checkList](#), [checkLogical](#), [checkMatrix](#), [checkNull](#), [checkNumeric](#), [checkPOSIXct](#), [checkRaw](#), [checkVector](#)

Other atomicvector: [checkAtomic](#), [checkVector](#)

### Examples

```
testAtomicVector(letters, min.len = 1L, any.missing = FALSE)
```

---

 checkBit

*Check if an argument is a bit vector*


---

**Description**

Check if an argument is a bit vector

**Usage**

```

checkBit(x, len = NULL, min.len = NULL, max.len = NULL,
         min.0 = NULL, min.1 = NULL, null.ok = FALSE)

check_bit(x, len = NULL, min.len = NULL, max.len = NULL,
          min.0 = NULL, min.1 = NULL, null.ok = FALSE)

assertBit(x, len = NULL, min.len = NULL, max.len = NULL,
          min.0 = NULL, min.1 = NULL, null.ok = FALSE,
          .var.name = vname(x), add = NULL)

assert_bit(x, len = NULL, min.len = NULL, max.len = NULL,
           min.0 = NULL, min.1 = NULL, null.ok = FALSE,
           .var.name = vname(x), add = NULL)

testBit(x, len = NULL, min.len = NULL, max.len = NULL,
        min.0 = NULL, min.1 = NULL, null.ok = FALSE)

test_bit(x, len = NULL, min.len = NULL, max.len = NULL,
         min.0 = NULL, min.1 = NULL, null.ok = FALSE)

expect_bit(x, len = NULL, min.len = NULL, max.len = NULL,
           min.0 = NULL, min.1 = NULL, null.ok = FALSE, info = NULL,
           label = vname(x))

```

**Arguments**

x	[any] Object to check.
len	[integer(1)] Exact expected length of x.
min.len	[integer(1)] Minimal length of x.
max.len	[integer(1)] Maximal length of x.
min.0	[integer(1)] Minimum number of elements being "0"/FALSE/off.

min.1	[integer(1)] Minimum number of elements being “1”/TRUE/on.
null.ok	[logical(1)] If set to TRUE, x may also be NULL. In this case only a type check of x is performed, all additional checks are disabled.
.var.name	[character(1)] Name of the checked object to print in assertions. Defaults to the heuristic implemented in <a href="#">vname</a> .
add	[AssertCollection] Collection to store assertion messages. See <a href="#">AssertCollection</a> .
info	[character(1)] Extra information to be included in the message for the testthat reporter. See <a href="#">expect_that</a> .
label	[character(1)] Name of the checked object to print in messages. Defaults to the heuristic implemented in <a href="#">vname</a> .

**Value**

Depending on the function prefix: If the check is successful, the functions `assertBit/assert_bit` return `x` invisibly, whereas `checkBit/check_bit` and `testBit/test_bit` return `TRUE`. If the check is not successful, `assertBit/assert_bit` throws an error message, `testBit/test_bit` returns `FALSE`, and `checkBit` returns a string with the error message. The function `expect_bit` always returns an [expectation](#).

**Examples**

```
library(bit)
x = as.bit(replace(logical(10), sample(10, 5), TRUE))
testBit(x, len = 10, min.0 = 1)
```

---

checkCharacter	<i>Check if an argument is a vector of type character</i>
----------------	---

---

**Description**

Check if an argument is a vector of type character

**Usage**

```
checkCharacter(x, min.chars = NULL, pattern = NULL, fixed = NULL,
  ignore.case = FALSE, any.missing = TRUE, all.missing = TRUE,
  len = NULL, min.len = NULL, max.len = NULL, unique = FALSE,
  sorted = FALSE, names = NULL, null.ok = FALSE)
```

```
check_character(x, min.chars = NULL, pattern = NULL, fixed = NULL,
```

```

ignore.case = FALSE, any.missing = TRUE, all.missing = TRUE,
len = NULL, min.len = NULL, max.len = NULL, unique = FALSE,
sorted = FALSE, names = NULL, null.ok = FALSE)

assertCharacter(x, min.chars = NULL, pattern = NULL, fixed = NULL,
  ignore.case = FALSE, any.missing = TRUE, all.missing = TRUE,
  len = NULL, min.len = NULL, max.len = NULL, unique = FALSE,
  sorted = FALSE, names = NULL, null.ok = FALSE,
  .var.name = vname(x), add = NULL)

assert_character(x, min.chars = NULL, pattern = NULL, fixed = NULL,
  ignore.case = FALSE, any.missing = TRUE, all.missing = TRUE,
  len = NULL, min.len = NULL, max.len = NULL, unique = FALSE,
  sorted = FALSE, names = NULL, null.ok = FALSE,
  .var.name = vname(x), add = NULL)

testCharacter(x, min.chars = NULL, pattern = NULL, fixed = NULL,
  ignore.case = FALSE, any.missing = TRUE, all.missing = TRUE,
  len = NULL, min.len = NULL, max.len = NULL, unique = FALSE,
  sorted = FALSE, names = NULL, null.ok = FALSE)

test_character(x, min.chars = NULL, pattern = NULL, fixed = NULL,
  ignore.case = FALSE, any.missing = TRUE, all.missing = TRUE,
  len = NULL, min.len = NULL, max.len = NULL, unique = FALSE,
  sorted = FALSE, names = NULL, null.ok = FALSE)

expect_character(x, min.chars = NULL, pattern = NULL, fixed = NULL,
  ignore.case = FALSE, any.missing = TRUE, all.missing = TRUE,
  len = NULL, min.len = NULL, max.len = NULL, unique = FALSE,
  sorted = FALSE, names = NULL, null.ok = FALSE, info = NULL,
  label = vname(x))

```

### Arguments

x	[any] Object to check.
min.chars	[integer(1)] Minimum number of characters for each element of x.
pattern	[character(1L)] Regular expression as used in <a href="#">grepl</a> . All non-missing elements of x must comply to this pattern.
fixed	[character(1)] Substring to detect in x. Will be used as pattern in <a href="#">grepl</a> with option fixed set to TRUE. All non-missing elements of x must contain this substring.
ignore.case	[logical(1)] See <a href="#">grepl</a> . Default is FALSE.
any.missing	[logical(1)] Are vectors with missing values allowed? Default is TRUE.

all.missing	[logical(1)] Are vectors with only missing values allowed? Default is TRUE.
len	[integer(1)] Exact expected length of x.
min.len	[integer(1)] Minimal length of x.
max.len	[integer(1)] Maximal length of x.
unique	[logical(1)] Must all values be unique? Default is FALSE.
sorted	[logical(1)] Elements must be sorted in ascending order. Missing values are ignored.
names	[character(1)] Check for names. See <a href="#">checkNamed</a> for possible values. Default is “any” which performs no check at all. Note that you can use <a href="#">checkSubset</a> to check for a specific set of names.
null.ok	[logical(1)] If set to TRUE, x may also be NULL. In this case only a type check of x is performed, all additional checks are disabled.
.var.name	[character(1)] Name of the checked object to print in assertions. Defaults to the heuristic implemented in <a href="#">vname</a> .
add	[AssertCollection] Collection to store assertion messages. See <a href="#">AssertCollection</a> .
info	[character(1)] Extra information to be included in the message for the testthat reporter. See <a href="#">expect_that</a> .
label	[character(1)] Name of the checked object to print in messages. Defaults to the heuristic implemented in <a href="#">vname</a> .

### Details

This function does not distinguish between NA, NA\_integer\_, NA\_real\_, NA\_complex\_, NA\_character\_ and NaN.

### Value

Depending on the function prefix: If the check is successful, the functions `assertCharacter/assert_character` return x invisibly, whereas `checkCharacter/check_character` and `testCharacter/test_character` return TRUE. If the check is not successful, `assertCharacter/assert_character` throws an error message, `testCharacter/test_character` returns FALSE, and `checkCharacter` returns a string with the error message. The function `expect_character` always returns an [expectation](#).

**See Also**

Other basetypes: [checkArray](#), [checkAtomicVector](#), [checkAtomic](#), [checkComplex](#), [checkDataFrame](#), [checkDate](#), [checkDouble](#), [checkEnvironment](#), [checkFactor](#), [checkFormula](#), [checkFunction](#), [checkIntegerish](#), [checkInteger](#), [checkList](#), [checkLogical](#), [checkMatrix](#), [checkNull](#), [checkNumeric](#), [checkPOSIXct](#), [checkRaw](#), [checkVector](#)

**Examples**

```
testCharacter(letters, min.len = 1, any.missing = FALSE)
testCharacter(letters, min.chars = 2)
testCharacter("example", pattern = "xa")
```

---

checkChoice	<i>Check if an object is an element of a given set</i>
-------------	--

---

**Description**

Check if an object is an element of a given set

**Usage**

```
checkChoice(x, choices, null.ok = FALSE, fmatch = FALSE)
check_choice(x, choices, null.ok = FALSE, fmatch = FALSE)
assertChoice(x, choices, null.ok = FALSE, fmatch = FALSE,
  .var.name = vname(x), add = NULL)
assert_choice(x, choices, null.ok = FALSE, fmatch = FALSE,
  .var.name = vname(x), add = NULL)
testChoice(x, choices, null.ok = FALSE, fmatch = FALSE)
test_choice(x, choices, null.ok = FALSE, fmatch = FALSE)
expect_choice(x, choices, null.ok = FALSE, fmatch = FALSE,
  info = NULL, label = vname(x))
```

**Arguments**

x	[any] Object to check.
choices	[atomic] Set of possible values.
null.ok	[logical(1)] If set to TRUE, x may also be NULL. In this case only a type check of x is performed, all additional checks are disabled.

fmatch	[logical(1)] Use the set operations implemented in <code>fmatch</code> in package <b>fastmatch</b> . If <b>fastmatch</b> is not installed, this silently falls back to <code>match</code> . <code>fmatch</code> modifies <code>y</code> by reference: A hash table is added as attribute which is used in subsequent calls.
.var.name	[character(1)] Name of the checked object to print in assertions. Defaults to the heuristic implemented in <code>vname</code> .
add	[AssertCollection] Collection to store assertion messages. See <code>AssertCollection</code> .
info	[character(1)] Extra information to be included in the message for the testthat reporter. See <code>expect_that</code> .
label	[character(1)] Name of the checked object to print in messages. Defaults to the heuristic implemented in <code>vname</code> .

### Value

Depending on the function prefix: If the check is successful, the functions `assertChoice/assert_choice` return `x` invisibly, whereas `checkChoice/check_choice` and `testChoice/test_choice` return `TRUE`. If the check is not successful, `assertChoice/assert_choice` throws an error message, `testChoice/test_choice` returns `FALSE`, and `checkChoice` returns a string with the error message. The function `expect_choice` always returns an `expectation`.

### Note

The object `x` must be of the same type as the set w.r.t. `typeof`. Integers and doubles are both treated as numeric.

### See Also

Other set: `checkDisjunct`, `checkSetEqual`, `checkSubset`

### Examples

```
testChoice("x", letters)

# x is not converted before the comparison (except for numerics)
testChoice(factor("a"), "a")
testChoice(1, "1")
testChoice(1, as.integer(1))
```



---

checkClass	<i>Check the class membership of an argument</i>
------------	--

---

### Description

Check the class membership of an argument

### Usage

```
checkClass(x, classes, ordered = FALSE, null.ok = FALSE)
```

```
check_class(x, classes, ordered = FALSE, null.ok = FALSE)
```

```
assertClass(x, classes, ordered = FALSE, null.ok = FALSE,
  .var.name = vname(x), add = NULL)
```

```
assert_class(x, classes, ordered = FALSE, null.ok = FALSE,
  .var.name = vname(x), add = NULL)
```

```
testClass(x, classes, ordered = FALSE, null.ok = FALSE)
```

```
test_class(x, classes, ordered = FALSE, null.ok = FALSE)
```

```
expect_class(x, classes, ordered = FALSE, null.ok = FALSE,
  info = NULL, label = vname(x))
```

### Arguments

x	[any] Object to check.
classes	[character] Class names to check for inheritance with <a href="#">inherits</a> . x must inherit from all specified classes.
ordered	[logical(1)] Expect x to be specialized in provided order. Default is FALSE.
null.ok	[logical(1)] If set to TRUE, x may also be NULL. In this case only a type check of x is performed, all additional checks are disabled.
.var.name	[character(1)] Name of the checked object to print in assertions. Defaults to the heuristic implemented in <a href="#">vname</a> .
add	[AssertCollection] Collection to store assertion messages. See <a href="#">AssertCollection</a> .
info	[character(1)] Extra information to be included in the message for the testthat reporter. See <a href="#">expect_that</a> .

label [character(1)]  
Name of the checked object to print in messages. Defaults to the heuristic implemented in [vname](#).

### Value

Depending on the function prefix: If the check is successful, the functions `assertClass/assert_class` return `x` invisibly, whereas `checkClass/check_class` and `testClass/test_class` return `TRUE`. If the check is not successful, `assertClass/assert_class` throws an error message, `testClass/test_class` returns `FALSE`, and `checkClass` returns a string with the error message. The function `expect_class` always returns an [expectation](#).

### See Also

Other attributes: [checkMultiClass](#), [checkNamed](#), [checkNames](#)

Other classes: [checkMultiClass](#), [checkR6](#)

### Examples

```
# Create an object with classes "foo" and "bar"
x = 1
class(x) = c("foo", "bar")

# is x of class "foo"?
testClass(x, "foo")

# is x of class "foo" and "bar"?
testClass(x, c("foo", "bar"))

# is x of class "foo" or "bar"?
## Not run:
assert(
  checkClass(x, "foo"),
  checkClass(x, "bar")
)

## End(Not run)
# is x most specialized as "bar"?
testClass(x, "bar", ordered = TRUE)
```

---

checkComplex

*Check if an argument is a vector of type complex*

---

### Description

Check if an argument is a vector of type complex

**Usage**

```

checkComplex(x, any.missing = TRUE, all.missing = TRUE, len = NULL,
  min.len = NULL, max.len = NULL, unique = FALSE, names = NULL,
  null.ok = FALSE)

check_complex(x, any.missing = TRUE, all.missing = TRUE, len = NULL,
  min.len = NULL, max.len = NULL, unique = FALSE, names = NULL,
  null.ok = FALSE)

assertComplex(x, any.missing = TRUE, all.missing = TRUE, len = NULL,
  min.len = NULL, max.len = NULL, unique = FALSE, names = NULL,
  null.ok = FALSE, .var.name = vname(x), add = NULL)

assert_complex(x, any.missing = TRUE, all.missing = TRUE, len = NULL,
  min.len = NULL, max.len = NULL, unique = FALSE, names = NULL,
  null.ok = FALSE, .var.name = vname(x), add = NULL)

testComplex(x, any.missing = TRUE, all.missing = TRUE, len = NULL,
  min.len = NULL, max.len = NULL, unique = FALSE, names = NULL,
  null.ok = FALSE)

test_complex(x, any.missing = TRUE, all.missing = TRUE, len = NULL,
  min.len = NULL, max.len = NULL, unique = FALSE, names = NULL,
  null.ok = FALSE)

expect_complex(x, any.missing = TRUE, all.missing = TRUE, len = NULL,
  min.len = NULL, max.len = NULL, unique = FALSE, names = NULL,
  null.ok = FALSE, info = NULL, label = vname(x))

```

**Arguments**

x	[any] Object to check.
any.missing	[logical(1)] Are vectors with missing values allowed? Default is TRUE.
all.missing	[logical(1)] Are vectors with only missing values allowed? Default is TRUE.
len	[integer(1)] Exact expected length of x.
min.len	[integer(1)] Minimal length of x.
max.len	[integer(1)] Maximal length of x.
unique	[logical(1)] Must all values be unique? Default is FALSE.

names	[character(1)] Check for names. See <a href="#">checkNamed</a> for possible values. Default is “any” which performs no check at all. Note that you can use <a href="#">checkSubset</a> to check for a specific set of names.
null.ok	[logical(1)] If set to TRUE, x may also be NULL. In this case only a type check of x is performed, all additional checks are disabled.
.var.name	[character(1)] Name of the checked object to print in assertions. Defaults to the heuristic implemented in <a href="#">vname</a> .
add	[AssertCollection] Collection to store assertion messages. See <a href="#">AssertCollection</a> .
info	[character(1)] Extra information to be included in the message for the testthat reporter. See <a href="#">expect_that</a> .
label	[character(1)] Name of the checked object to print in messages. Defaults to the heuristic implemented in <a href="#">vname</a> .

### Details

This function does not distinguish between NA, NA\_integer\_, NA\_real\_, NA\_complex\_ NA\_character\_ and NaN.

### Value

Depending on the function prefix: If the check is successful, the functions `assertComplex/assert_complex` return x invisibly, whereas `checkComplex/check_complex` and `testComplex/test_complex` return TRUE. If the check is not successful, `assertComplex/assert_complex` throws an error message, `testComplex/test_complex` returns FALSE, and `checkComplex` returns a string with the error message. The function `expect_complex` always returns an [expectation](#).

### See Also

Other basetypes: [checkArray](#), [checkAtomicVector](#), [checkAtomic](#), [checkCharacter](#), [checkDataFrame](#), [checkDate](#), [checkDouble](#), [checkEnvironment](#), [checkFactor](#), [checkFormula](#), [checkFunction](#), [checkIntegerish](#), [checkInteger](#), [checkList](#), [checkLogical](#), [checkMatrix](#), [checkNull](#), [checkNumeric](#), [checkPOSIXct](#), [checkRaw](#), [checkVector](#)

### Examples

```
testComplex(1)
testComplex(1+1i)
```

---

checkCount	<i>Check if an argument is a count</i>
------------	--

---

### Description

A count is defined as non-negative integerish value.

### Usage

```
checkCount(x, na.ok = FALSE, positive = FALSE,
           tol = sqrt(.Machine$double.eps), null.ok = FALSE)
```

```
check_count(x, na.ok = FALSE, positive = FALSE,
            tol = sqrt(.Machine$double.eps), null.ok = FALSE)
```

```
assertCount(x, na.ok = FALSE, positive = FALSE,
            tol = sqrt(.Machine$double.eps), null.ok = FALSE, coerce = FALSE,
            .var.name = vname(x), add = NULL)
```

```
assert_count(x, na.ok = FALSE, positive = FALSE,
             tol = sqrt(.Machine$double.eps), null.ok = FALSE, coerce = FALSE,
             .var.name = vname(x), add = NULL)
```

```
testCount(x, na.ok = FALSE, positive = FALSE,
          tol = sqrt(.Machine$double.eps), null.ok = FALSE)
```

```
test_count(x, na.ok = FALSE, positive = FALSE,
           tol = sqrt(.Machine$double.eps), null.ok = FALSE)
```

```
expect_count(x, na.ok = FALSE, positive = FALSE,
             tol = sqrt(.Machine$double.eps), null.ok = FALSE, info = NULL,
             label = vname(x))
```

### Arguments

x	[any] Object to check.
na.ok	[logical(1)] Are missing values allowed? Default is FALSE.
positive	[logical(1)] Must x be positive ( $\geq 1$ )? Default is FALSE, allowing 0.
tol	[double(1)] Numerical tolerance used to check whether a double or complex can be converted. Default is <code>sqrt(.Machine\$double.eps)</code> .

null.ok	[logical(1)] If set to TRUE, x may also be NULL. In this case only a type check of x is performed, all additional checks are disabled.
coerce	[logical(1)] If TRUE, the input x is returned as integer after an successful assertion.
.var.name	[character(1)] Name of the checked object to print in assertions. Defaults to the heuristic implemented in <a href="#">vname</a> .
add	[AssertCollection] Collection to store assertion messages. See <a href="#">AssertCollection</a> .
info	[character(1)] Extra information to be included in the message for the testthat reporter. See <a href="#">expect_that</a> .
label	[character(1)] Name of the checked object to print in messages. Defaults to the heuristic implemented in <a href="#">vname</a> .

### Details

This function does not distinguish between NA, NA\_integer\_, NA\_real\_, NA\_complex\_, NA\_character\_ and NaN.

### Value

Depending on the function prefix: If the check is successful, the functions `assertCount/assert_count` return x invisibly, whereas `checkCount/check_count` and `testCount/test_count` return TRUE. If the check is not successful, `assertCount/assert_count` throws an error message, `testCount/test_count` returns FALSE, and `checkCount` returns a string with the error message. The function `expect_count` always returns an [expectation](#).

### Note

To perform an assertion and then convert to integer, use [asCount](#). `assertCount` will not convert numerics to integer.

### See Also

Other scalars: [checkFlag](#), [checkInt](#), [checkNumber](#), [checkScalarNA](#), [checkScalar](#), [checkString](#)

### Examples

```
testCount(1)
testCount(-1)
```

---

checkDataFrame	<i>Check if an argument is a data frame</i>
----------------	---

---

**Description**

Check if an argument is a data frame

**Usage**

```
checkDataFrame(x, types = character(0L), any.missing = TRUE,  
  all.missing = TRUE, min.rows = NULL, max.rows = NULL,  
  min.cols = NULL, max.cols = NULL, nrows = NULL, ncols = NULL,  
  row.names = NULL, col.names = NULL, null.ok = FALSE)
```

```
check_data_frame(x, types = character(0L), any.missing = TRUE,  
  all.missing = TRUE, min.rows = NULL, max.rows = NULL,  
  min.cols = NULL, max.cols = NULL, nrows = NULL, ncols = NULL,  
  row.names = NULL, col.names = NULL, null.ok = FALSE)
```

```
assertDataFrame(x, types = character(0L), any.missing = TRUE,  
  all.missing = TRUE, min.rows = NULL, max.rows = NULL,  
  min.cols = NULL, max.cols = NULL, nrows = NULL, ncols = NULL,  
  row.names = NULL, col.names = NULL, null.ok = FALSE,  
  .var.name = vname(x), add = NULL)
```

```
assert_data_frame(x, types = character(0L), any.missing = TRUE,  
  all.missing = TRUE, min.rows = NULL, max.rows = NULL,  
  min.cols = NULL, max.cols = NULL, nrows = NULL, ncols = NULL,  
  row.names = NULL, col.names = NULL, null.ok = FALSE,  
  .var.name = vname(x), add = NULL)
```

```
testDataFrame(x, types = character(0L), any.missing = TRUE,  
  all.missing = TRUE, min.rows = NULL, max.rows = NULL,  
  min.cols = NULL, max.cols = NULL, nrows = NULL, ncols = NULL,  
  row.names = NULL, col.names = NULL, null.ok = FALSE)
```

```
test_data_frame(x, types = character(0L), any.missing = TRUE,  
  all.missing = TRUE, min.rows = NULL, max.rows = NULL,  
  min.cols = NULL, max.cols = NULL, nrows = NULL, ncols = NULL,  
  row.names = NULL, col.names = NULL, null.ok = FALSE)
```

```
expect_data_frame(x, types = character(0L), any.missing = TRUE,  
  all.missing = TRUE, min.rows = NULL, max.rows = NULL,  
  min.cols = NULL, max.cols = NULL, nrows = NULL, ncols = NULL,  
  row.names = NULL, col.names = NULL, null.ok = FALSE, info = NULL,  
  label = vname(x))
```

**Arguments**

x	[any] Object to check.
types	[character] Character vector of class names. Each list element must inherit from at least one of the provided types. The types “logical”, “integer”, “integerish”, “double”, “numeric”, “complex”, “character”, “factor”, “atomic”, “vector”, “atomicvector”, “array”, “matrix”, “list”, “function”, “environment” and “null” are supported. For other types <a href="#">inherits</a> is used as a fallback to check x’s inheritance. Defaults to character(0) (no check).
any.missing	[logical(1)] Are missing values allowed? Default is TRUE.
all.missing	[logical(1)] Are columns with only missing values allowed? Default is TRUE.
min.rows	[integer(1)] Minimum number of rows.
max.rows	[integer(1)] Maximum number of rows.
min.cols	[integer(1)] Minimum number of columns.
max.cols	[integer(1)] Maximum number of columns.
nrows	[integer(1)] Exact number of rows.
ncols	[integer(1)] Exact number of columns.
row.names	[character(1)] Check for row names. Default is “NULL” (no check). See <a href="#">checkNamed</a> for possible values. Note that you can use <a href="#">checkSubset</a> to check for a specific set of names.
col.names	[character(1)] Check for column names. Default is “NULL” (no check). See <a href="#">checkNamed</a> for possible values. Note that you can use <a href="#">checkSubset</a> to test for a specific set of names.
null.ok	[logical(1)] If set to TRUE, x may also be NULL. In this case only a type check of x is performed, all additional checks are disabled.
.var.name	[character(1)] Name of the checked object to print in assertions. Defaults to the heuristic implemented in <a href="#">vname</a> .
add	[AssertCollection] Collection to store assertion messages. See <a href="#">AssertCollection</a> .



info	[character(1)] Extra information to be included in the message for the testthat reporter. See <a href="#">expect_that</a> .
label	[character(1)] Name of the checked object to print in messages. Defaults to the heuristic implemented in <a href="#">vname</a> .

**Value**

Depending on the function prefix: If the check is successful, the functions `assertDataFrame/assert_data_frame` return `x` invisibly, whereas `checkDataFrame/check_data_frame` and `testDataFrame/test_data_frame` return `TRUE`. If the check is not successful, `assertDataFrame/assert_data_frame` throws an error message, `testDataFrame/test_data_frame` returns `FALSE`, and `checkDataFrame` returns a string with the error message. The function `expect_data_frame` always returns an [expectation](#).

**See Also**

Other compound: [checkArray](#), [checkDataTable](#), [checkMatrix](#), [checkTibble](#)

Other basetypes: [checkArray](#), [checkAtomicVector](#), [checkAtomic](#), [checkCharacter](#), [checkComplex](#), [checkDate](#), [checkDouble](#), [checkEnvironment](#), [checkFactor](#), [checkFormula](#), [checkFunction](#), [checkIntegerish](#), [checkInteger](#), [checkList](#), [checkLogical](#), [checkMatrix](#), [checkNull](#), [checkNumeric](#), [checkPOSIXct](#), [checkRaw](#), [checkVector](#)

**Examples**

```
testDataFrame(iris)
testDataFrame(iris, types = c("numeric", "factor"), min.rows = 1, col.names = "named")
```

---

checkDataTable	<i>Check if an argument is a data table</i>
----------------	---

---

**Description**

Check if an argument is a data table

**Usage**

```
checkDataTable(x, key = NULL, index = NULL, types = character(0L),
  any.missing = TRUE, all.missing = TRUE, min.rows = NULL,
  max.rows = NULL, min.cols = NULL, max.cols = NULL, nrows = NULL,
  ncols = NULL, row.names = NULL, col.names = NULL,
  null.ok = FALSE)

check_data_table(x, key = NULL, index = NULL, types = character(0L),
  any.missing = TRUE, all.missing = TRUE, min.rows = NULL,
  max.rows = NULL, min.cols = NULL, max.cols = NULL, nrows = NULL,
  ncols = NULL, row.names = NULL, col.names = NULL,
```

```

null.ok = FALSE)

assertDataTable(x, key = NULL, index = NULL, types = character(0L),
  any.missing = TRUE, all.missing = TRUE, min.rows = NULL,
  max.rows = NULL, min.cols = NULL, max.cols = NULL, nrows = NULL,
  ncols = NULL, row.names = NULL, col.names = NULL,
  null.ok = FALSE, .var.name = vname(x), add = NULL)

assert_data_table(x, key = NULL, index = NULL, types = character(0L),
  any.missing = TRUE, all.missing = TRUE, min.rows = NULL,
  max.rows = NULL, min.cols = NULL, max.cols = NULL, nrows = NULL,
  ncols = NULL, row.names = NULL, col.names = NULL,
  null.ok = FALSE, .var.name = vname(x), add = NULL)

testDataTable(x, key = NULL, index = NULL, types = character(0L),
  any.missing = TRUE, all.missing = TRUE, min.rows = NULL,
  max.rows = NULL, min.cols = NULL, max.cols = NULL, nrows = NULL,
  ncols = NULL, row.names = NULL, col.names = NULL,
  null.ok = FALSE)

test_data_table(x, key = NULL, index = NULL, types = character(0L),
  any.missing = TRUE, all.missing = TRUE, min.rows = NULL,
  max.rows = NULL, min.cols = NULL, max.cols = NULL, nrows = NULL,
  ncols = NULL, row.names = NULL, col.names = NULL,
  null.ok = FALSE)

expect_data_table(x, key = NULL, index = NULL, types = character(0L),
  any.missing = TRUE, all.missing = TRUE, min.rows = NULL,
  max.rows = NULL, min.cols = NULL, max.cols = NULL, nrows = NULL,
  ncols = NULL, row.names = NULL, col.names = NULL,
  null.ok = FALSE, info = NULL, label = vname(x))

```

## Arguments

x	[any] Object to check.
key	[character] Expected primary key(s) of the data table.
index	[character] Expected secondary key(s) of the data table.
types	[character] Character vector of class names. Each list element must inherit from at least one of the provided types. The types “logical”, “integer”, “integerish”, “double”, “numeric”, “complex”, “character”, “factor”, “atomic”, “vector” “atomicvector”, “array”, “matrix”, “list”, “function”, “environment” and “null” are supported. For other types <code>inherits</code> is used as a fallback to check x’s inheritance. Defaults to <code>character(0)</code> (no check).

any.missing	[logical(1)] Are missing values allowed? Default is TRUE.
all.missing	[logical(1)] Are matrices with only missing values allowed? Default is TRUE.
min.rows	[integer(1)] Minimum number of rows.
max.rows	[integer(1)] Maximum number of rows.
min.cols	[integer(1)] Minimum number of columns.
max.cols	[integer(1)] Maximum number of columns.
nrows	[integer(1)] Exact number of rows.
ncols	[integer(1)] Exact number of columns.
row.names	[character(1)] Check for row names. Default is “NULL” (no check). See <a href="#">checkNamed</a> for possible values. Note that you can use <a href="#">checkSubset</a> to check for a specific set of names.
col.names	[character(1)] Check for column names. Default is “NULL” (no check). See <a href="#">checkNamed</a> for possible values. Note that you can use <a href="#">checkSubset</a> to test for a specific set of names.
null.ok	[logical(1)] If set to TRUE, x may also be NULL. In this case only a type check of x is performed, all additional checks are disabled.
.var.name	[character(1)] Name of the checked object to print in assertions. Defaults to the heuristic implemented in <a href="#">vname</a> .
add	[AssertCollection] Collection to store assertion messages. See <a href="#">AssertCollection</a> .
info	[character(1)] Extra information to be included in the message for the testthat reporter. See <a href="#">expect_that</a> .
label	[character(1)] Name of the checked object to print in messages. Defaults to the heuristic implemented in <a href="#">vname</a> .

### Value

Depending on the function prefix: If the check is successful, the functions `assertDataTable/assert_data_table` return `x` invisibly, whereas `checkDataTable/check_data_table` and `testDataTable/test_data_table` return `TRUE`. If the check is not successful, `assertDataTable/assert_data_table` throws an error message, `testDataTable/test_data_table` returns `FALSE`, and `checkDataTable` returns a string with the error message. The function `expect_data_table` always returns an [expectation](#).

**See Also**

Other compound: [checkArray](#), [checkDataFrame](#), [checkMatrix](#), [checkTibble](#)

**Examples**

```
library(data.table)
dt = as.data.table(iris)
setkeyv(dt, "Species")
setkeyv(dt, "Sepal.Length", physical = FALSE)
testDataTable(dt)
testDataTable(dt, key = "Species", index = "Sepal.Length", any.missing = FALSE)
```

---

checkDate

*Check that an argument is a Date*

---

**Description**

Checks that an object is of class [Date](#).

**Usage**

```
checkDate(x, lower = NULL, upper = NULL, any.missing = TRUE,
  all.missing = TRUE, len = NULL, min.len = NULL, max.len = NULL,
  unique = FALSE, null.ok = FALSE)
```

```
check_date(x, lower = NULL, upper = NULL, any.missing = TRUE,
  all.missing = TRUE, len = NULL, min.len = NULL, max.len = NULL,
  unique = FALSE, null.ok = FALSE)
```

```
assertDate(x, lower = NULL, upper = NULL, any.missing = TRUE,
  all.missing = TRUE, len = NULL, min.len = NULL, max.len = NULL,
  unique = FALSE, null.ok = FALSE, .var.name = vname(x),
  add = NULL)
```

```
assert_date(x, lower = NULL, upper = NULL, any.missing = TRUE,
  all.missing = TRUE, len = NULL, min.len = NULL, max.len = NULL,
  unique = FALSE, null.ok = FALSE, .var.name = vname(x),
  add = NULL)
```

```
testDate(x, lower = NULL, upper = NULL, any.missing = TRUE,
  all.missing = TRUE, len = NULL, min.len = NULL, max.len = NULL,
  unique = FALSE, null.ok = FALSE)
```

```
test_date(x, lower = NULL, upper = NULL, any.missing = TRUE,
  all.missing = TRUE, len = NULL, min.len = NULL, max.len = NULL,
  unique = FALSE, null.ok = FALSE)
```

```
expect_date(x, lower = NULL, upper = NULL, any.missing = TRUE,
  all.missing = TRUE, len = NULL, min.len = NULL, max.len = NULL,
  unique = FALSE, null.ok = FALSE, info = NULL, label = vname(x))
```

### Arguments

x	[any] Object to check.
lower	[Date] All non-missing dates in x must be >= this date. Comparison is done via <a href="#">Ops.Date</a> .
upper	[Date] All non-missing dates in x must be before <= this date. Comparison is done via <a href="#">Ops.Date</a> .
any.missing	[logical(1)] Are vectors with missing values allowed? Default is TRUE.
all.missing	[logical(1)] Are vectors with only missing values allowed? Default is TRUE.
len	[integer(1)] Exact expected length of x.
min.len	[integer(1)] Minimal length of x.
max.len	[integer(1)] Maximal length of x.
unique	[logical(1)] Must all values be unique? Default is FALSE.
null.ok	[logical(1)] If set to TRUE, x may also be NULL. In this case only a type check of x is performed, all additional checks are disabled.
.var.name	[character(1)] Name of the checked object to print in assertions. Defaults to the heuristic implemented in <a href="#">vname</a> .
add	[AssertCollection] Collection to store assertion messages. See <a href="#">AssertCollection</a> .
info	[character(1)] Extra information to be included in the message for the testthat reporter. See <a href="#">expect_that</a> .
label	[character(1)] Name of the checked object to print in messages. Defaults to the heuristic implemented in <a href="#">vname</a> .

### Value

Depending on the function prefix: If the check is successful, the functions `assertAtomic/assert_atomic` return x invisibly, whereas `checkAtomic/check_atomic` and `testAtomic/test_atomic` return TRUE.

If the check is not successful, `assertAtomic/assert_atomic` throws an error message, `testAtomic/test_atomic` returns `FALSE`, and `checkAtomic` returns a string with the error message. The function `expect_atomic` always returns an [expectation](#).

### See Also

Other basetypes: [checkArray](#), [checkAtomicVector](#), [checkAtomic](#), [checkCharacter](#), [checkComplex](#), [checkDataFrame](#), [checkDouble](#), [checkEnvironment](#), [checkFactor](#), [checkFormula](#), [checkFunction](#), [checkIntegerish](#), [checkInteger](#), [checkList](#), [checkLogical](#), [checkMatrix](#), [checkNull](#), [checkNumeric](#), [checkPOSIXct](#), [checkRaw](#), [checkVector](#)

---

`checkDirectoryExists` *Check for existence and access rights of directories*

---

### Description

Check for existence and access rights of directories

### Usage

```
checkDirectoryExists(x, access = "")

check_directory_exists(x, access = "")

assertDirectoryExists(x, access = "", .var.name = vname(x),
  add = NULL)

assert_directory_exists(x, access = "", .var.name = vname(x),
  add = NULL)

testDirectoryExists(x, access = "")

test_directory_exists(x, access = "")

expect_directory_exists(x, access = "", info = NULL,
  label = vname(x))

checkDirectory(x, access = "")

assertDirectory(x, access = "", .var.name = vname(x), add = NULL)

assert_directory(x, access = "", .var.name = vname(x), add = NULL)

testDirectory(x, access = "")

test_directory(x, access = "")

expect_directory(x, access = "", info = NULL, label = vname(x))
```

**Arguments**

x	[any] Object to check.
access	[character(1)] Single string containing possible characters 'r', 'w' and 'x' to force a check for read, write or execute access rights, respectively. Write and executable rights are not checked on Windows.
.var.name	[character(1)] Name of the checked object to print in assertions. Defaults to the heuristic implemented in <a href="#">vname</a> .
add	[AssertCollection] Collection to store assertion messages. See <a href="#">AssertCollection</a> .
info	[character(1)] Extra information to be included in the message for the testthat reporter. See <a href="#">expect_that</a> .
label	[character(1)] Name of the checked object to print in messages. Defaults to the heuristic implemented in <a href="#">vname</a> .

**Value**

Depending on the function prefix: If the check is successful, the functions `assertDirectoryExists/assert_directory_exists` return `x` invisibly, whereas `checkDirectoryExists/check_directory_exists` and `testDirectoryExists/test_directory_exists` return `TRUE`. If the check is not successful, `assertDirectoryExists/assert_directory_exists` throws an error message, `testDirectoryExists/test_directory_exists` returns `FALSE`, and `checkDirectoryExists` returns a string with the error message. The function `expect_directory_exists` always returns an [expectation](#).

**Note**

The functions without the suffix “exists” are deprecated and will be removed from the package in a future version due to name clashes.

**See Also**

Other filesystem: [checkAccess](#), [checkFileExists](#), [checkPathForOutput](#)

**Examples**

```
# Is R's home directory readable?
testDirectory(R.home(), "r")

# Is R's home directory readable and writable?
testDirectory(R.home(), "rw")
```

---

checkDisjunct	<i>Check if an argument is disjunct from a given set</i>
---------------	--

---

### Description

Check if an argument is disjunct from a given set

### Usage

```
checkDisjunct(x, y, fmatch = FALSE)
```

```
check_disjunct(x, y, fmatch = FALSE)
```

```
assertDisjunct(x, y, fmatch = FALSE, .var.name = vname(x),
  add = NULL)
```

```
assert_disjunct(x, y, fmatch = FALSE, .var.name = vname(x),
  add = NULL)
```

```
testDisjunct(x, y, fmatch = FALSE)
```

```
test_disjunct(x, y, fmatch = FALSE)
```

```
expect_disjunct(x, y, fmatch = FALSE, info = NULL, label = vname(x))
```

### Arguments

x	[any] Object to check.
y	[atomic] Other Set.
fmatch	[logical(1)] Use the set operations implemented in <a href="#">fmatch</a> in package <b>fastmatch</b> . If <b>fastmatch</b> is not installed, this silently falls back to <a href="#">match</a> . <a href="#">fmatch</a> modifies y by reference: A hash table is added as attribute which is used in subsequent calls.
.var.name	[character(1)] Name of the checked object to print in assertions. Defaults to the heuristic implemented in <a href="#">vname</a> .
add	[AssertCollection] Collection to store assertion messages. See <a href="#">AssertCollection</a> .
info	[character(1)] Extra information to be included in the message for the testthat reporter. See <a href="#">expect_that</a> .
label	[character(1)] Name of the checked object to print in messages. Defaults to the heuristic implemented in <a href="#">vname</a> .



**Value**

Depending on the function prefix: If the check is successful, the functions `assertDisjunct/assert_disjunct` return `x` invisibly, whereas `checkDisjunct/check_disjunct` and `testDisjunct/test_disjunct` return `TRUE`. If the check is not successful, `assertDisjunct/assert_disjunct` throws an error message, `testDisjunct/test_disjunct` returns `FALSE`, and `checkDisjunct` returns a string with the error message. The function `expect_disjunct` always returns an [expectation](#).

**Note**

The object `x` must be of the same type as the set w.r.t. [typeof](#). Integers and doubles are both treated as numeric.

**See Also**

Other set: [checkChoice](#), [checkSetEqual](#), [checkSubset](#)

**Examples**

```
testDisjunct(1L, letters)
testDisjunct(c("a", "z"), letters)

# x is not converted before the comparison (except for numerics)
testDisjunct(factor("a"), "a")
testDisjunct(1, "1")
testDisjunct(1, as.integer(1))
```

---

checkDouble

*Check that an argument is a vector of type double*

---

**Description**

Check that an argument is a vector of type double

**Usage**

```
checkDouble(x, lower = -Inf, upper = Inf, finite = FALSE,
  any.missing = TRUE, all.missing = TRUE, len = NULL,
  min.len = NULL, max.len = NULL, unique = FALSE, sorted = FALSE,
  names = NULL, null.ok = FALSE)

check_double(x, lower = -Inf, upper = Inf, finite = FALSE,
  any.missing = TRUE, all.missing = TRUE, len = NULL,
  min.len = NULL, max.len = NULL, unique = FALSE, sorted = FALSE,
  names = NULL, null.ok = FALSE)

assertDouble(x, lower = -Inf, upper = Inf, finite = FALSE,
  any.missing = TRUE, all.missing = TRUE, len = NULL,
  min.len = NULL, max.len = NULL, unique = FALSE, sorted = FALSE,
```

```

names = NULL, null.ok = FALSE, .var.name = vname(x), add = NULL)

assert_double(x, lower = -Inf, upper = Inf, finite = FALSE,
  any.missing = TRUE, all.missing = TRUE, len = NULL,
  min.len = NULL, max.len = NULL, unique = FALSE, sorted = FALSE,
  names = NULL, null.ok = FALSE, .var.name = vname(x), add = NULL)

testDouble(x, lower = -Inf, upper = Inf, finite = FALSE,
  any.missing = TRUE, all.missing = TRUE, len = NULL,
  min.len = NULL, max.len = NULL, unique = FALSE, sorted = FALSE,
  names = NULL, null.ok = FALSE)

test_double(x, lower = -Inf, upper = Inf, finite = FALSE,
  any.missing = TRUE, all.missing = TRUE, len = NULL,
  min.len = NULL, max.len = NULL, unique = FALSE, sorted = FALSE,
  names = NULL, null.ok = FALSE)

expect_double(x, lower = -Inf, upper = Inf, finite = FALSE,
  any.missing = TRUE, all.missing = TRUE, len = NULL,
  min.len = NULL, max.len = NULL, unique = FALSE, sorted = FALSE,
  names = NULL, null.ok = FALSE, info = NULL, label = vname(x))

```

### Arguments

x	[any] Object to check.
lower	[numeric(1)] Lower value all elements of x must be greater than or equal to.
upper	[numeric(1)] Upper value all elements of x must be lower than or equal to.
finite	[logical(1)] Check for only finite values? Default is FALSE.
any.missing	[logical(1)] Are vectors with missing values allowed? Default is TRUE.
all.missing	[logical(1)] Are vectors with only missing values allowed? Default is TRUE.
len	[integer(1)] Exact expected length of x.
min.len	[integer(1)] Minimal length of x.
max.len	[integer(1)] Maximal length of x.
unique	[logical(1)] Must all values be unique? Default is FALSE.
sorted	[logical(1)] Elements must be sorted in ascending order. Missing values are ignored.

names	[character(1)] Check for names. See <a href="#">checkNamed</a> for possible values. Default is “any” which performs no check at all. Note that you can use <a href="#">checkSubset</a> to check for a specific set of names.
null.ok	[logical(1)] If set to TRUE, x may also be NULL. In this case only a type check of x is performed, all additional checks are disabled.
.var.name	[character(1)] Name of the checked object to print in assertions. Defaults to the heuristic implemented in <a href="#">vname</a> .
add	[AssertCollection] Collection to store assertion messages. See <a href="#">AssertCollection</a> .
info	[character(1)] Extra information to be included in the message for the testthat reporter. See <a href="#">expect_that</a> .
label	[character(1)] Name of the checked object to print in messages. Defaults to the heuristic implemented in <a href="#">vname</a> .

### Details

This function does not distinguish between NA, NA\_integer\_, NA\_real\_, NA\_complex\_ NA\_character\_ and NaN.

### Value

Depending on the function prefix: If the check is successful, the functions `assertDouble/assert_double` return x invisibly, whereas `checkDouble/check_double` and `testDouble/test_double` return TRUE. If the check is not successful, `assertDouble/assert_double` throws an error message, `testDouble/test_double` returns FALSE, and `checkDouble` returns a string with the error message. The function `expect_double` always returns an [expectation](#).

### See Also

Other basetypes: [checkArray](#), [checkAtomicVector](#), [checkAtomic](#), [checkCharacter](#), [checkComplex](#), [checkDataFrame](#), [checkDate](#), [checkEnvironment](#), [checkFactor](#), [checkFormula](#), [checkFunction](#), [checkIntegerish](#), [checkInteger](#), [checkList](#), [checkLogical](#), [checkMatrix](#), [checkNull](#), [checkNumeric](#), [checkPOSIXct](#), [checkRaw](#), [checkVector](#)

### Examples

```
testDouble(1)
testDouble(1L)
testDouble(1, min.len = 1, lower = 0)
```

---

checkEnvironment      *Check if an argument is an environment*

---

### Description

Check if an argument is an environment

### Usage

```
checkEnvironment(x, contains = character(0L), null.ok = FALSE)

check_environment(x, contains = character(0L), null.ok = FALSE)

assertEnvironment(x, contains = character(0L), null.ok = FALSE,
  .var.name = vname(x), add = NULL)

assert_environment(x, contains = character(0L), null.ok = FALSE,
  .var.name = vname(x), add = NULL)

testEnvironment(x, contains = character(0L), null.ok = FALSE)

test_environment(x, contains = character(0L), null.ok = FALSE)

expect_environment(x, contains = character(0L), null.ok = FALSE,
  info = NULL, label = vname(x))
```

### Arguments

x	[any] Object to check.
contains	[character] Vector of object names expected in the environment. Defaults to <code>character(0)</code> .
null.ok	[logical(1)] If set to TRUE, x may also be NULL. In this case only a type check of x is performed, all additional checks are disabled.
.var.name	[character(1)] Name of the checked object to print in assertions. Defaults to the heuristic implemented in <code>vname</code> .
add	[AssertCollection] Collection to store assertion messages. See <a href="#">AssertCollection</a> .
info	[character(1)] Extra information to be included in the message for the testthat reporter. See <a href="#">expect_that</a> .
label	[character(1)] Name of the checked object to print in messages. Defaults to the heuristic implemented in <code>vname</code> .

**Value**

Depending on the function prefix: If the check is successful, the functions `assertEnvironment/assert_environment` return `x` invisibly, whereas `checkEnvironment/check_environment` and `testEnvironment/test_environment` return `TRUE`. If the check is not successful, `assertEnvironment/assert_environment` throws an error message, `testEnvironment/test_environment` returns `FALSE`, and `checkEnvironment` returns a string with the error message. The function `expect_environment` always returns an [expectation](#).

**See Also**

Other basetypes: [checkArray](#), [checkAtomicVector](#), [checkAtomic](#), [checkCharacter](#), [checkComplex](#), [checkDataFrame](#), [checkDate](#), [checkDouble](#), [checkFactor](#), [checkFormula](#), [checkFunction](#), [checkIntegerish](#), [checkInteger](#), [checkList](#), [checkLogical](#), [checkMatrix](#), [checkNull](#), [checkNumeric](#), [checkPOSIXct](#), [checkRaw](#), [checkVector](#)

**Examples**

```
ee = as.environment(list(a = 1))
testEnvironment(ee)
testEnvironment(ee, contains = "a")
```

---

 checkFactor

*Check if an argument is a factor*


---

**Description**

Check if an argument is a factor

**Usage**

```
checkFactor(x, levels = NULL, ordered = NA, empty.levels.ok = TRUE,
  any.missing = TRUE, all.missing = TRUE, len = NULL,
  min.len = NULL, max.len = NULL, n.levels = NULL,
  min.levels = NULL, max.levels = NULL, unique = FALSE,
  names = NULL, null.ok = FALSE)

check_factor(x, levels = NULL, ordered = NA, empty.levels.ok = TRUE,
  any.missing = TRUE, all.missing = TRUE, len = NULL,
  min.len = NULL, max.len = NULL, n.levels = NULL,
  min.levels = NULL, max.levels = NULL, unique = FALSE,
  names = NULL, null.ok = FALSE)

assertFactor(x, levels = NULL, ordered = NA, empty.levels.ok = TRUE,
  any.missing = TRUE, all.missing = TRUE, len = NULL,
  min.len = NULL, max.len = NULL, n.levels = NULL,
  min.levels = NULL, max.levels = NULL, unique = FALSE,
  names = NULL, null.ok = FALSE, .var.name = vname(x), add = NULL)
```

```
assert_factor(x, levels = NULL, ordered = NA, empty.levels.ok = TRUE,
  any.missing = TRUE, all.missing = TRUE, len = NULL,
  min.len = NULL, max.len = NULL, n.levels = NULL,
  min.levels = NULL, max.levels = NULL, unique = FALSE,
  names = NULL, null.ok = FALSE, .var.name = vname(x), add = NULL)
```

```
testFactor(x, levels = NULL, ordered = NA, empty.levels.ok = TRUE,
  any.missing = TRUE, all.missing = TRUE, len = NULL,
  min.len = NULL, max.len = NULL, n.levels = NULL,
  min.levels = NULL, max.levels = NULL, unique = FALSE,
  names = NULL, null.ok = FALSE)
```

```
test_factor(x, levels = NULL, ordered = NA, empty.levels.ok = TRUE,
  any.missing = TRUE, all.missing = TRUE, len = NULL,
  min.len = NULL, max.len = NULL, n.levels = NULL,
  min.levels = NULL, max.levels = NULL, unique = FALSE,
  names = NULL, null.ok = FALSE)
```

```
expect_factor(x, levels = NULL, ordered = NA, empty.levels.ok = TRUE,
  any.missing = TRUE, all.missing = TRUE, len = NULL,
  min.len = NULL, max.len = NULL, n.levels = NULL,
  min.levels = NULL, max.levels = NULL, unique = FALSE,
  names = NULL, null.ok = FALSE, info = NULL, label = vname(x))
```

## Arguments

x	[any] Object to check.
levels	[character] Vector of allowed factor levels.
ordered	[logical(1)] Check for an ordered factor? If FALSE or TRUE, checks explicitly for an un-ordered or ordered factor, respectively. Default is NA which does not perform any additional check.
empty.levels.ok	[logical(1)] Are empty levels allowed? Default is TRUE.
any.missing	[logical(1)] Are vectors with missing values allowed? Default is TRUE.
all.missing	[logical(1)] Are vectors with only missing values allowed? Default is TRUE.
len	[integer(1)] Exact expected length of x.
min.len	[integer(1)] Minimal length of x.

max.len	[integer(1)] Maximal length of x.
n.levels	[integer(1)] Exact number of factor levels. Default is NULL (no check).
min.levels	[integer(1)] Minimum number of factor levels. Default is NULL (no check).
max.levels	[integer(1)] Maximum number of factor levels. Default is NULL (no check).
unique	[logical(1)] Must all values be unique? Default is FALSE.
names	[character(1)] Check for names. See <a href="#">checkNamed</a> for possible values. Default is “any” which performs no check at all. Note that you can use <a href="#">checkSubset</a> to check for a specific set of names.
null.ok	[logical(1)] If set to TRUE, x may also be NULL. In this case only a type check of x is performed, all additional checks are disabled.
.var.name	[character(1)] Name of the checked object to print in assertions. Defaults to the heuristic implemented in <a href="#">vname</a> .
add	[AssertCollection] Collection to store assertion messages. See <a href="#">AssertCollection</a> .
info	[character(1)] Extra information to be included in the message for the testthat reporter. See <a href="#">expect_that</a> .
label	[character(1)] Name of the checked object to print in messages. Defaults to the heuristic implemented in <a href="#">vname</a> .

### Value

Depending on the function prefix: If the check is successful, the functions `assertFactor/assert_factor` return x invisibly, whereas `checkFactor/check_factor` and `testFactor/test_factor` return TRUE. If the check is not successful, `assertFactor/assert_factor` throws an error message, `testFactor/test_factor` returns FALSE, and `checkFactor` returns a string with the error message. The function `expect_factor` always returns an [expectation](#).

### See Also

Other basetypes: [checkArray](#), [checkAtomicVector](#), [checkAtomic](#), [checkCharacter](#), [checkComplex](#), [checkDataFrame](#), [checkDate](#), [checkDouble](#), [checkEnvironment](#), [checkFormula](#), [checkFunction](#), [checkIntegerish](#), [checkInteger](#), [checkList](#), [checkLogical](#), [checkMatrix](#), [checkNull](#), [checkNumeric](#), [checkPOSIXct](#), [checkRaw](#), [checkVector](#)

**Examples**

```
x = factor("a", levels = c("a", "b"))
testFactor(x)
testFactor(x, empty.levels.ok = FALSE)
```

---

checkFALSE	<i>Check if an argument is FALSE</i>
------------	--------------------------------------

---

**Description**

Simply checks if an argument is FALSE.

**Usage**

```
checkFALSE(x, na.ok = FALSE)
check_false(x, na.ok = FALSE)
assertFALSE(x, na.ok = FALSE, .var.name = vname(x), add = NULL)
assert_false(x, na.ok = FALSE, .var.name = vname(x), add = NULL)
testFALSE(x, na.ok = FALSE)
test_false(x, na.ok = FALSE)
```

**Arguments**

x	[any] Object to check.
na.ok	[logical(1)] Are missing values allowed? Default is FALSE.
.var.name	[character(1)] Name of the checked object to print in assertions. Defaults to the heuristic implemented in <a href="#">vname</a> .
add	[AssertCollection] Collection to store assertion messages. See <a href="#">AssertCollection</a> .

**Value**

Depending on the function prefix: If the check is successful, the functions `assertFALSE./assert_false.` return `x` invisibly, whereas `checkFALSE./check_false.` and `testFALSE./test_false.` return `TRUE`. If the check is not successful, `assertFALSE./assert_false.` throws an error message, `testFALSE./test_false.` returns `FALSE`, and `checkFALSE.` returns a string with the error message. The function `expect_false.` always returns an [expectation](#).



**Examples**

```
testFALSE(FALSE)
testFALSE(TRUE)
```

---

checkFileExists	<i>Check existence and access rights of files</i>
-----------------	---

---

**Description**

Check existence and access rights of files

**Usage**

```
checkFileExists(x, access = "", extension = NULL)
check_file_exists(x, access = "", extension = NULL)
assertFileExists(x, access = "", extension = NULL,
  .var.name = vname(x), add = NULL)
assert_file_exists(x, access = "", extension = NULL,
  .var.name = vname(x), add = NULL)
testFileExists(x, access = "", extension = NULL)
test_file_exists(x, access = "", extension = NULL)
expect_file_exists(x, access = "", extension = NULL, info = NULL,
  label = vname(x))
checkFile(x, access = "", extension = NULL)
assertFile(x, access = "", extension = NULL, .var.name = vname(x),
  add = NULL)
assert_file(x, access = "", extension = NULL, .var.name = vname(x),
  add = NULL)
testFile(x, access = "", extension = NULL)
expect_file(x, access = "", extension = NULL, info = NULL,
  label = vname(x))
```

**Arguments**

x	[any] Object to check.
---	---------------------------

access	[character(1)] Single string containing possible characters 'r', 'w' and 'x' to force a check for read, write or execute access rights, respectively. Write and executable rights are not checked on Windows.
extension	[character] Vector of allowed file extensions, matched case insensitive.
.var.name	[character(1)] Name of the checked object to print in assertions. Defaults to the heuristic implemented in <a href="#">vname</a> .
add	[AssertCollection] Collection to store assertion messages. See <a href="#">AssertCollection</a> .
info	[character(1)] Extra information to be included in the message for the testthat reporter. See <a href="#">expect_that</a> .
label	[character(1)] Name of the checked object to print in messages. Defaults to the heuristic implemented in <a href="#">vname</a> .

### Value

Depending on the function prefix: If the check is successful, the functions `assertFileExists/assert_file_exists` return `x` invisibly, whereas `checkFileExists/check_file_exists` and `testFileExists/test_file_exists` return `TRUE`. If the check is not successful, `assertFileExists/assert_file_exists` throws an error message, `testFileExists/test_file_exists` returns `FALSE`, and `checkFileExists` returns a string with the error message. The function `expect_file_exists` always returns an [expectation](#).

### Note

The functions without the suffix “exists” are deprecated and will be removed from the package in a future version due to name clashes. `test_file` has been unexported already.

### See Also

Other filesystem: [checkAccess](#), [checkDirectoryExists](#), [checkPathForOutput](#)

### Examples

```
# Check if R's COPYING file is readable
testFileExists(file.path(R.home(), "COPYING"), access = "r")

# Check if R's COPYING file is readable and writable
testFileExists(file.path(R.home(), "COPYING"), access = "rw")
```

---

checkFlag	<i>Check if an argument is a flag</i>
-----------	---------------------------------------

---

### Description

A flag is defined as single logical value.

### Usage

```
checkFlag(x, na.ok = FALSE, null.ok = FALSE)
```

```
check_flag(x, na.ok = FALSE, null.ok = FALSE)
```

```
assertFlag(x, na.ok = FALSE, null.ok = FALSE, .var.name = vname(x),  
  add = NULL)
```

```
assert_flag(x, na.ok = FALSE, null.ok = FALSE, .var.name = vname(x),  
  add = NULL)
```

```
testFlag(x, na.ok = FALSE, null.ok = FALSE)
```

```
test_flag(x, na.ok = FALSE, null.ok = FALSE)
```

```
expect_flag(x, na.ok = FALSE, null.ok = FALSE, info = NULL,  
  label = vname(x))
```

### Arguments

x	[any] Object to check.
na.ok	[logical(1)] Are missing values allowed? Default is FALSE.
null.ok	[logical(1)] If set to TRUE, x may also be NULL. In this case only a type check of x is performed, all additional checks are disabled.
.var.name	[character(1)] Name of the checked object to print in assertions. Defaults to the heuristic implemented in <a href="#">vname</a> .
add	[AssertCollection] Collection to store assertion messages. See <a href="#">AssertCollection</a> .
info	[character(1)] Extra information to be included in the message for the testthat reporter. See <a href="#">expect_that</a> .
label	[character(1)] Name of the checked object to print in messages. Defaults to the heuristic implemented in <a href="#">vname</a> .

**Details**

This function does not distinguish between NA, NA\_integer\_, NA\_real\_, NA\_complex\_, NA\_character\_ and NaN.

**Value**

Depending on the function prefix: If the check is successful, the functions `assertFlag/assert_flag` return `x` invisibly, whereas `checkFlag/check_flag` and `testFlag/test_flag` return `TRUE`. If the check is not successful, `assertFlag/assert_flag` throws an error message, `testFlag/test_flag` returns `FALSE`, and `checkFlag` returns a string with the error message. The function `expect_flag` always returns an [expectation](#).

**See Also**

Other scalars: [checkCount](#), [checkInt](#), [checkNumber](#), [checkScalarNA](#), [checkScalar](#), [checkString](#)

**Examples**

```
testFlag(TRUE)
testFlag(1)
```

---

checkFormula	<i>Check if an argument is a formula</i>
--------------	--

---

**Description**

Check if an argument is a formula

**Usage**

```
checkFormula(x, null.ok = FALSE)

check_formula(x, null.ok = FALSE)

assertFormula(x, null.ok = FALSE, .var.name = vname(x), add = NULL)

assert_formula(x, null.ok = FALSE, .var.name = vname(x), add = NULL)

testFormula(x, null.ok = FALSE)

test_formula(x, null.ok = FALSE)

expect_formula(x, null.ok = FALSE, info = NULL, label = vname(x))
```

**Arguments**

x	[any] Object to check.
null.ok	[logical(1)] If set to TRUE, x may also be NULL. In this case only a type check of x is performed, all additional checks are disabled.
.var.name	[character(1)] Name of the checked object to print in assertions. Defaults to the heuristic implemented in <a href="#">vname</a> .
add	[AssertCollection] Collection to store assertion messages. See <a href="#">AssertCollection</a> .
info	[character(1)] Extra information to be included in the message for the testthat reporter. See <a href="#">expect_that</a> .
label	[character(1)] Name of the checked object to print in messages. Defaults to the heuristic implemented in <a href="#">vname</a> .

**Value**

Depending on the function prefix: If the check is successful, the functions `assertFormula/assert_formula` return `x` invisibly, whereas `checkFormula/check_formula` and `testFormula/test_formula` return `TRUE`. If the check is not successful, `assertFormula/assert_formula` throws an error message, `testFormula/test_formula` returns `FALSE`, and `checkFormula` returns a string with the error message. The function `expect_formula` always returns an [expectation](#).

**See Also**

Other basetypes: [checkArray](#), [checkAtomicVector](#), [checkAtomic](#), [checkCharacter](#), [checkComplex](#), [checkDataFrame](#), [checkDate](#), [checkDouble](#), [checkEnvironment](#), [checkFactor](#), [checkFunction](#), [checkIntegerish](#), [checkInteger](#), [checkList](#), [checkLogical](#), [checkMatrix](#), [checkNull](#), [checkNumeric](#), [checkPOSIXct](#), [checkRaw](#), [checkVector](#)

**Examples**

```
f = Species ~ Sepal.Length + Sepal.Width
checkFormula(f)
```

---

checkFunction	<i>Check if an argument is a function</i>
---------------	---

---

**Description**

Check if an argument is a function

**Usage**

```
checkFunction(x, args = NULL, ordered = FALSE, nargs = NULL,
             null.ok = FALSE)
```

```
check_function(x, args = NULL, ordered = FALSE, nargs = NULL,
              null.ok = FALSE)
```

```
assertFunction(x, args = NULL, ordered = FALSE, nargs = NULL,
              null.ok = FALSE, .var.name = vname(x), add = NULL)
```

```
assert_function(x, args = NULL, ordered = FALSE, nargs = NULL,
               null.ok = FALSE, .var.name = vname(x), add = NULL)
```

```
testFunction(x, args = NULL, ordered = FALSE, nargs = NULL,
            null.ok = FALSE)
```

```
test_function(x, args = NULL, ordered = FALSE, nargs = NULL,
              null.ok = FALSE)
```

```
expect_function(x, args = NULL, ordered = FALSE, nargs = NULL,
               null.ok = FALSE, info = NULL, label = vname(x))
```

**Arguments**

x	[any] Object to check.
args	[character] Expected formal arguments. Checks that a function has no arguments if set to character(0). Default is NULL (no check).
ordered	[logical(1)] Flag whether the arguments provided in args must be the first length(args) arguments of the function in the specified order. Default is FALSE.
nargs	[integer(1)] Required number of arguments, without . . . . Default is NULL (no check).
null.ok	[logical(1)] If set to TRUE, x may also be NULL. In this case only a type check of x is performed, all additional checks are disabled.
.var.name	[character(1)] Name of the checked object to print in assertions. Defaults to the heuristic implemented in <a href="#">vname</a> .
add	[AssertCollection] Collection to store assertion messages. See <a href="#">AssertCollection</a> .
info	[character(1)] Extra information to be included in the message for the testthat reporter. See <a href="#">expect_that</a> .

label [character(1)]  
Name of the checked object to print in messages. Defaults to the heuristic implemented in [vname](#).

### Value

Depending on the function prefix: If the check is successful, the functions `assertFunction/assert_function` return `x` invisibly, whereas `checkFunction/check_function` and `testFunction/test_function` return `TRUE`. If the check is not successful, `assertFunction/assert_function` throws an error message, `testFunction/test_function` returns `FALSE`, and `checkFunction` returns a string with the error message. The function `expect_function` always returns an [expectation](#).

### See Also

Other basetypes: [checkArray](#), [checkAtomicVector](#), [checkAtomic](#), [checkCharacter](#), [checkComplex](#), [checkDataFrame](#), [checkDate](#), [checkDouble](#), [checkEnvironment](#), [checkFactor](#), [checkFormula](#), [checkIntegerish](#), [checkInteger](#), [checkList](#), [checkLogical](#), [checkMatrix](#), [checkNull](#), [checkNumeric](#), [checkPOSIXct](#), [checkRaw](#), [checkVector](#)

### Examples

```
testFunction(mean)
testFunction(mean, args = "x")
```

---

checkInt	<i>Check if an argument is a single integerish value</i>
----------	--

---

### Description

Check if an argument is a single integerish value

### Usage

```
checkInt(x, na.ok = FALSE, lower = -Inf, upper = Inf,
  tol = sqrt(.Machine$double.eps), null.ok = FALSE)

check_int(x, na.ok = FALSE, lower = -Inf, upper = Inf,
  tol = sqrt(.Machine$double.eps), null.ok = FALSE)

assertInt(x, na.ok = FALSE, lower = -Inf, upper = Inf,
  tol = sqrt(.Machine$double.eps), null.ok = FALSE, coerce = FALSE,
  .var.name = vname(x), add = NULL)

assert_int(x, na.ok = FALSE, lower = -Inf, upper = Inf,
  tol = sqrt(.Machine$double.eps), null.ok = FALSE, coerce = FALSE,
  .var.name = vname(x), add = NULL)

testInt(x, na.ok = FALSE, lower = -Inf, upper = Inf,
```

```

tol = sqrt(.Machine$double.eps), null.ok = FALSE)

test_int(x, na.ok = FALSE, lower = -Inf, upper = Inf,
  tol = sqrt(.Machine$double.eps), null.ok = FALSE)

expect_int(x, na.ok = FALSE, lower = -Inf, upper = Inf,
  tol = sqrt(.Machine$double.eps), null.ok = FALSE, info = NULL,
  label = vname(x))

```

### Arguments

x	[any] Object to check.
na.ok	[logical(1)] Are missing values allowed? Default is FALSE.
lower	[numeric(1)] Lower value all elements of x must be greater than or equal to.
upper	[numeric(1)] Upper value all elements of x must be lower than or equal to.
tol	[double(1)] Numerical tolerance used to check whether a double or complex can be converted. Default is <code>sqrt(.Machine\$double.eps)</code> .
null.ok	[logical(1)] If set to TRUE, x may also be NULL. In this case only a type check of x is performed, all additional checks are disabled.
coerce	[logical(1)] If TRUE, the input x is returned as integer after an successful assertion.
.var.name	[character(1)] Name of the checked object to print in assertions. Defaults to the heuristic implemented in <code>vname</code> .
add	[AssertCollection] Collection to store assertion messages. See <a href="#">AssertCollection</a> .
info	[character(1)] Extra information to be included in the message for the testthat reporter. See <a href="#">expect_that</a> .
label	[character(1)] Name of the checked object to print in messages. Defaults to the heuristic implemented in <code>vname</code> .

### Details

This function does not distinguish between NA, NA\_integer\_, NA\_real\_, NA\_complex\_, NA\_character\_ and NaN.



**Value**

Depending on the function prefix: If the check is successful, the functions `assertInt/assert_int` return `x` invisibly, whereas `checkInt/check_int` and `testInt/test_int` return `TRUE`. If the check is not successful, `assertInt/assert_int` throws an error message, `testInt/test_int` returns `FALSE`, and `checkInt` returns a string with the error message. The function `expect_int` always returns an [expectation](#).

**Note**

To perform an assertion and then convert to integer, use [asInt](#). `assertInt` will not convert numerics to integer.

**See Also**

Other scalars: [checkCount](#), [checkFlag](#), [checkNumber](#), [checkScalarNA](#), [checkScalar](#), [checkString](#)

**Examples**

```
testInt(1)
testInt(-1, lower = 0)
```

---

checkInteger

*Check if an argument is vector of type integer*

---

**Description**

Check if an argument is vector of type integer

**Usage**

```
checkInteger(x, lower = -Inf, upper = Inf, any.missing = TRUE,
  all.missing = TRUE, len = NULL, min.len = NULL, max.len = NULL,
  unique = FALSE, sorted = FALSE, names = NULL, null.ok = FALSE)
```

```
check_integer(x, lower = -Inf, upper = Inf, any.missing = TRUE,
  all.missing = TRUE, len = NULL, min.len = NULL, max.len = NULL,
  unique = FALSE, sorted = FALSE, names = NULL, null.ok = FALSE)
```

```
assertInteger(x, lower = -Inf, upper = Inf, any.missing = TRUE,
  all.missing = TRUE, len = NULL, min.len = NULL, max.len = NULL,
  unique = FALSE, sorted = FALSE, names = NULL, null.ok = FALSE,
  .var.name = vname(x), add = NULL)
```

```
assert_integer(x, lower = -Inf, upper = Inf, any.missing = TRUE,
  all.missing = TRUE, len = NULL, min.len = NULL, max.len = NULL,
  unique = FALSE, sorted = FALSE, names = NULL, null.ok = FALSE,
  .var.name = vname(x), add = NULL)
```

```
testInteger(x, lower = -Inf, upper = Inf, any.missing = TRUE,
  all.missing = TRUE, len = NULL, min.len = NULL, max.len = NULL,
  unique = FALSE, sorted = FALSE, names = NULL, null.ok = FALSE)
```

```
test_integer(x, lower = -Inf, upper = Inf, any.missing = TRUE,
  all.missing = TRUE, len = NULL, min.len = NULL, max.len = NULL,
  unique = FALSE, sorted = FALSE, names = NULL, null.ok = FALSE)
```

```
expect_integer(x, lower = -Inf, upper = Inf, any.missing = TRUE,
  all.missing = TRUE, len = NULL, min.len = NULL, max.len = NULL,
  unique = FALSE, sorted = FALSE, names = NULL, null.ok = FALSE,
  info = NULL, label = vname(x))
```

### Arguments

x	[any] Object to check.
lower	[numeric(1)] Lower value all elements of x must be greater than or equal to.
upper	[numeric(1)] Upper value all elements of x must be lower than or equal to.
any.missing	[logical(1)] Are vectors with missing values allowed? Default is TRUE.
all.missing	[logical(1)] Are vectors with only missing values allowed? Default is TRUE.
len	[integer(1)] Exact expected length of x.
min.len	[integer(1)] Minimal length of x.
max.len	[integer(1)] Maximal length of x.
unique	[logical(1)] Must all values be unique? Default is FALSE.
sorted	[logical(1)] Elements must be sorted in ascending order. Missing values are ignored.
names	[character(1)] Check for names. See <a href="#">checkNamed</a> for possible values. Default is “any” which performs no check at all. Note that you can use <a href="#">checkSubset</a> to check for a specific set of names.
null.ok	[logical(1)] If set to TRUE, x may also be NULL. In this case only a type check of x is performed, all additional checks are disabled.
.var.name	[character(1)] Name of the checked object to print in assertions. Defaults to the heuristic implemented in <a href="#">vname</a> .

add	[AssertCollection] Collection to store assertion messages. See <a href="#">AssertCollection</a> .
info	[character(1)] Extra information to be included in the message for the testthat reporter. See <a href="#">expect_that</a> .
label	[character(1)] Name of the checked object to print in messages. Defaults to the heuristic implemented in <a href="#">vname</a> .

**Details**

This function does not distinguish between NA, NA\_integer\_, NA\_real\_, NA\_complex\_ NA\_character\_ and NaN.

**Value**

Depending on the function prefix: If the check is successful, the functions `assertInteger/assert_integer` return `x` invisibly, whereas `checkInteger/check_integer` and `testInteger/test_integer` return `TRUE`. If the check is not successful, `assertInteger/assert_integer` throws an error message, `testInteger/test_integer` returns `FALSE`, and `checkInteger` returns a string with the error message. The function `expect_integer` always returns an [expectation](#).

**See Also**

[asInteger](#)

Other basetypes: [checkArray](#), [checkAtomicVector](#), [checkAtomic](#), [checkCharacter](#), [checkComplex](#), [checkDataFrame](#), [checkDate](#), [checkDouble](#), [checkEnvironment](#), [checkFactor](#), [checkFormula](#), [checkFunction](#), [checkIntegerish](#), [checkList](#), [checkLogical](#), [checkMatrix](#), [checkNull](#), [checkNumeric](#), [checkPOSIXct](#), [checkRaw](#), [checkVector](#)

**Examples**

```
testInteger(1L)
testInteger(1.)
testInteger(1:2, lower = 1, upper = 2, any.missing = FALSE)
```

---

checkIntegerish

*Check if an object is an integerish vector*

---

**Description**

An integerish value is defined as value safely convertible to integer. This includes integers and numeric values which are close to an integer w.r.t. a numeric tolerance.

**Usage**

```
checkIntegerish(x, tol = sqrt(.Machine$double.eps), lower = -Inf,
  upper = Inf, any.missing = TRUE, all.missing = TRUE, len = NULL,
  min.len = NULL, max.len = NULL, unique = FALSE, sorted = FALSE,
  names = NULL, null.ok = FALSE)
```

```
check_integerish(x, tol = sqrt(.Machine$double.eps), lower = -Inf,
  upper = Inf, any.missing = TRUE, all.missing = TRUE, len = NULL,
  min.len = NULL, max.len = NULL, unique = FALSE, sorted = FALSE,
  names = NULL, null.ok = FALSE)
```

```
assertIntegerish(x, tol = sqrt(.Machine$double.eps), lower = -Inf,
  upper = Inf, any.missing = TRUE, all.missing = TRUE, len = NULL,
  min.len = NULL, max.len = NULL, unique = FALSE, sorted = FALSE,
  names = NULL, null.ok = FALSE, coerce = FALSE,
  .var.name = vname(x), add = NULL)
```

```
assert_integerish(x, tol = sqrt(.Machine$double.eps), lower = -Inf,
  upper = Inf, any.missing = TRUE, all.missing = TRUE, len = NULL,
  min.len = NULL, max.len = NULL, unique = FALSE, sorted = FALSE,
  names = NULL, null.ok = FALSE, coerce = FALSE,
  .var.name = vname(x), add = NULL)
```

```
testIntegerish(x, tol = sqrt(.Machine$double.eps), lower = -Inf,
  upper = Inf, any.missing = TRUE, all.missing = TRUE, len = NULL,
  min.len = NULL, max.len = NULL, unique = FALSE, sorted = FALSE,
  names = NULL, null.ok = FALSE)
```

```
test_integerish(x, tol = sqrt(.Machine$double.eps), lower = -Inf,
  upper = Inf, any.missing = TRUE, all.missing = TRUE, len = NULL,
  min.len = NULL, max.len = NULL, unique = FALSE, sorted = FALSE,
  names = NULL, null.ok = FALSE)
```

```
expect_integerish(x, tol = sqrt(.Machine$double.eps), lower = -Inf,
  upper = Inf, any.missing = TRUE, all.missing = TRUE, len = NULL,
  min.len = NULL, max.len = NULL, unique = FALSE, sorted = FALSE,
  names = NULL, null.ok = FALSE, info = NULL, label = vname(x))
```

**Arguments**

x	[any] Object to check.
tol	[double(1)] Numerical tolerance used to check whether a double or complex can be converted. Default is <code>sqrt(.Machine\$double.eps)</code> .
lower	[numeric(1)] Lower value all elements of x must be greater than or equal to.

upper	[numeric(1)] Upper value all elements of x must be lower than or equal to.
any.missing	[logical(1)] Are vectors with missing values allowed? Default is TRUE.
all.missing	[logical(1)] Are vectors with only missing values allowed? Default is TRUE.
len	[integer(1)] Exact expected length of x.
min.len	[integer(1)] Minimal length of x.
max.len	[integer(1)] Maximal length of x.
unique	[logical(1)] Must all values be unique? Default is FALSE.
sorted	[logical(1)] Elements must be sorted in ascending order. Missing values are ignored.
names	[character(1)] Check for names. See <a href="#">checkNamed</a> for possible values. Default is “any” which performs no check at all. Note that you can use <a href="#">checkSubset</a> to check for a specific set of names.
null.ok	[logical(1)] If set to TRUE, x may also be NULL. In this case only a type check of x is performed, all additional checks are disabled.
coerce	[logical(1)] If TRUE, the input x is returned as integer after an successful assertion.
.var.name	[character(1)] Name of the checked object to print in assertions. Defaults to the heuristic implemented in <a href="#">vname</a> .
add	[AssertCollection] Collection to store assertion messages. See <a href="#">AssertCollection</a> .
info	[character(1)] Extra information to be included in the message for the testthat reporter. See <a href="#">expect_that</a> .
label	[character(1)] Name of the checked object to print in messages. Defaults to the heuristic implemented in <a href="#">vname</a> .

### Details

This function does not distinguish between NA, NA\_integer\_, NA\_real\_, NA\_complex\_ NA\_character\_ and NaN.

**Value**

Depending on the function prefix: If the check is successful, the functions `assertIntegerish/assert_integerish` return `x` invisibly, whereas `checkIntegerish/check_integerish` and `testIntegerish/test_integerish` return `TRUE`. If the check is not successful, `assertIntegerish/assert_integerish` throws an error message, `testIntegerish/test_integerish` returns `FALSE`, and `checkIntegerish` returns a string with the error message. The function `expect_integerish` always returns an [expectation](#).

**Note**

To convert from `integerish` to `integer`, use [asInteger](#).

**See Also**

Other basetypes: [checkArray](#), [checkAtomicVector](#), [checkAtomic](#), [checkCharacter](#), [checkComplex](#), [checkDataFrame](#), [checkDate](#), [checkDouble](#), [checkEnvironment](#), [checkFactor](#), [checkFormula](#), [checkFunction](#), [checkInteger](#), [checkList](#), [checkLogical](#), [checkMatrix](#), [checkNull](#), [checkNumeric](#), [checkPOSIXct](#), [checkRaw](#), [checkVector](#)

**Examples**

```
testIntegerish(1L)
testIntegerish(1.)
testIntegerish(1:2, lower = 1L, upper = 2L, any.missing = FALSE)
```

---

checkList

*Check if an argument is a list*

---

**Description**

Check if an argument is a list

**Usage**

```
checkList(x, types = character(0L), any.missing = TRUE,
  all.missing = TRUE, len = NULL, min.len = NULL, max.len = NULL,
  unique = FALSE, names = NULL, null.ok = FALSE)
```

```
check_list(x, types = character(0L), any.missing = TRUE,
  all.missing = TRUE, len = NULL, min.len = NULL, max.len = NULL,
  unique = FALSE, names = NULL, null.ok = FALSE)
```

```
assertList(x, types = character(0L), any.missing = TRUE,
  all.missing = TRUE, len = NULL, min.len = NULL, max.len = NULL,
  unique = FALSE, names = NULL, null.ok = FALSE,
  .var.name = vname(x), add = NULL)
```

```
assert_list(x, types = character(0L), any.missing = TRUE,
```

```

all.missing = TRUE, len = NULL, min.len = NULL, max.len = NULL,
unique = FALSE, names = NULL, null.ok = FALSE,
.var.name = vname(x), add = NULL)

testList(x, types = character(0L), any.missing = TRUE,
  all.missing = TRUE, len = NULL, min.len = NULL, max.len = NULL,
  unique = FALSE, names = NULL, null.ok = FALSE)

test_list(x, types = character(0L), any.missing = TRUE,
  all.missing = TRUE, len = NULL, min.len = NULL, max.len = NULL,
  unique = FALSE, names = NULL, null.ok = FALSE)

expect_list(x, types = character(0L), any.missing = TRUE,
  all.missing = TRUE, len = NULL, min.len = NULL, max.len = NULL,
  unique = FALSE, names = NULL, null.ok = FALSE, info = NULL,
  label = vname(x))

```

### Arguments

x	[any] Object to check.
types	[character] Character vector of class names. Each list element must inherit from at least one of the provided types. The types “logical”, “integer”, “integerish”, “double”, “numeric”, “complex”, “character”, “factor”, “atomic”, “vector” “atomicvector”, “array”, “matrix”, “list”, “function”, “environment” and “null” are supported. For other types <code>inherits</code> is used as a fallback to check x’s inheritance. Defaults to <code>character(0)</code> (no check).
any.missing	[logical(1)] Are vectors with missing values allowed? Default is TRUE.
all.missing	[logical(1)] Are vectors with only missing values allowed? Default is TRUE.
len	[integer(1)] Exact expected length of x.
min.len	[integer(1)] Minimal length of x.
max.len	[integer(1)] Maximal length of x.
unique	[logical(1)] Must all values be unique? Default is FALSE.
names	[character(1)] Check for names. See <code>checkNamed</code> for possible values. Default is “any” which performs no check at all. Note that you can use <code>checkSubset</code> to check for a specific set of names.
null.ok	[logical(1)] If set to TRUE, x may also be NULL. In this case only a type check of x is performed, all additional checks are disabled.

.var.name	[character(1)] Name of the checked object to print in assertions. Defaults to the heuristic implemented in <a href="#">vname</a> .
add	[AssertCollection] Collection to store assertion messages. See <a href="#">AssertCollection</a> .
info	[character(1)] Extra information to be included in the message for the testthat reporter. See <a href="#">expect_that</a> .
label	[character(1)] Name of the checked object to print in messages. Defaults to the heuristic implemented in <a href="#">vname</a> .
...	[any] Additional parameters used in a call of <a href="#">checkVector</a> .

### Value

Depending on the function prefix: If the check is successful, the functions `assertList/assert_list` return `x` invisibly, whereas `checkList/check_list` and `testList/test_list` return `TRUE`. If the check is not successful, `assertList/assert_list` throws an error message, `testList/test_list` returns `FALSE`, and `checkList` returns a string with the error message. The function `expect_list` always returns an [expectation](#).

### Note

Contrary to R's `is.list`, objects of type `pairlist` are not recognized as list.

Missingness is defined here as elements of the list being `NULL`, analogously to [anyMissing](#).

The test for uniqueness does differentiate between the different NA types which are built-in in R. This is required to be consistent with [unique](#) while checking scalar missing values. Also see the example.

### See Also

Other basetypes: [checkArray](#), [checkAtomicVector](#), [checkAtomic](#), [checkCharacter](#), [checkComplex](#), [checkDataFrame](#), [checkDate](#), [checkDouble](#), [checkEnvironment](#), [checkFactor](#), [checkFormula](#), [checkFunction](#), [checkIntegerish](#), [checkInteger](#), [checkLogical](#), [checkMatrix](#), [checkNull](#), [checkNumeric](#), [checkPOSIXct](#), [checkRaw](#), [checkVector](#)

### Examples

```
testList(list())
testList(as.list(iris), types = c("numeric", "factor"))

# Missingness
testList(list(1, NA), any.missing = FALSE)
testList(list(1, NULL), any.missing = FALSE)

# Uniqueness differentiates between different NA types:
testList(list(NA, NA), unique = TRUE)
testList(list(NA, NA_real_), unique = TRUE)
```



---

`checkLogical`*Check if an argument is a vector of type logical*

---

**Description**

Check if an argument is a vector of type logical

**Usage**

```
checkLogical(x, any.missing = TRUE, all.missing = TRUE, len = NULL,  
  min.len = NULL, max.len = NULL, unique = FALSE, names = NULL,  
  null.ok = FALSE)
```

```
check_logical(x, any.missing = TRUE, all.missing = TRUE, len = NULL,  
  min.len = NULL, max.len = NULL, unique = FALSE, names = NULL,  
  null.ok = FALSE)
```

```
assertLogical(x, any.missing = TRUE, all.missing = TRUE, len = NULL,  
  min.len = NULL, max.len = NULL, unique = FALSE, names = NULL,  
  null.ok = FALSE, .var.name = vname(x), add = NULL)
```

```
assert_logical(x, any.missing = TRUE, all.missing = TRUE, len = NULL,  
  min.len = NULL, max.len = NULL, unique = FALSE, names = NULL,  
  null.ok = FALSE, .var.name = vname(x), add = NULL)
```

```
testLogical(x, any.missing = TRUE, all.missing = TRUE, len = NULL,  
  min.len = NULL, max.len = NULL, unique = FALSE, names = NULL,  
  null.ok = FALSE)
```

```
test_logical(x, any.missing = TRUE, all.missing = TRUE, len = NULL,  
  min.len = NULL, max.len = NULL, unique = FALSE, names = NULL,  
  null.ok = FALSE)
```

```
expect_logical(x, any.missing = TRUE, all.missing = TRUE, len = NULL,  
  min.len = NULL, max.len = NULL, unique = FALSE, names = NULL,  
  null.ok = FALSE, info = NULL, label = vname(x))
```

**Arguments**

<code>x</code>	[any] Object to check.
<code>any.missing</code>	[logical(1)] Are vectors with missing values allowed? Default is TRUE.
<code>all.missing</code>	[logical(1)] Are vectors with only missing values allowed? Default is TRUE.

len	[integer(1)] Exact expected length of x.
min.len	[integer(1)] Minimal length of x.
max.len	[integer(1)] Maximal length of x.
unique	[logical(1)] Must all values be unique? Default is FALSE.
names	[character(1)] Check for names. See <a href="#">checkNamed</a> for possible values. Default is “any” which performs no check at all. Note that you can use <a href="#">checkSubset</a> to check for a specific set of names.
null.ok	[logical(1)] If set to TRUE, x may also be NULL. In this case only a type check of x is performed, all additional checks are disabled.
.var.name	[character(1)] Name of the checked object to print in assertions. Defaults to the heuristic implemented in <a href="#">vname</a> .
add	[AssertCollection] Collection to store assertion messages. See <a href="#">AssertCollection</a> .
info	[character(1)] Extra information to be included in the message for the testthat reporter. See <a href="#">expect_that</a> .
label	[character(1)] Name of the checked object to print in messages. Defaults to the heuristic implemented in <a href="#">vname</a> .

### Details

This function does not distinguish between NA, NA\_integer\_, NA\_real\_, NA\_complex\_ NA\_character\_ and NaN.

### Value

Depending on the function prefix: If the check is successful, the functions `assertLogical/assert_logical` return x invisibly, whereas `checkLogical/check_logical` and `testLogical/test_logical` return TRUE. If the check is not successful, `assertLogical/assert_logical` throws an error message, `testLogical/test_logical` returns FALSE, and `checkLogical` returns a string with the error message. The function `expect_logical` always returns an [expectation](#).

### See Also

[checkBit](#)

Other basetypes: [checkArray](#), [checkAtomicVector](#), [checkAtomic](#), [checkCharacter](#), [checkComplex](#), [checkDataFrame](#), [checkDate](#), [checkDouble](#), [checkEnvironment](#), [checkFactor](#), [checkFormula](#), [checkFunction](#), [checkIntegerish](#), [checkInteger](#), [checkList](#), [checkMatrix](#), [checkNull](#), [checkNumeric](#), [checkPOSIXct](#), [checkRaw](#), [checkVector](#)

**Examples**

```
testLogical(TRUE)
testLogical(TRUE, min.len = 1)
```

---

checkMatrix	<i>Check if an argument is a matrix</i>
-------------	---

---

**Description**

Check if an argument is a matrix

**Usage**

```
checkMatrix(x, mode = NULL, any.missing = TRUE, all.missing = TRUE,
  min.rows = NULL, max.rows = NULL, min.cols = NULL,
  max.cols = NULL, nrows = NULL, ncols = NULL, row.names = NULL,
  col.names = NULL, null.ok = FALSE)
```

```
check_matrix(x, mode = NULL, any.missing = TRUE, all.missing = TRUE,
  min.rows = NULL, max.rows = NULL, min.cols = NULL,
  max.cols = NULL, nrows = NULL, ncols = NULL, row.names = NULL,
  col.names = NULL, null.ok = FALSE)
```

```
assertMatrix(x, mode = NULL, any.missing = TRUE, all.missing = TRUE,
  min.rows = NULL, max.rows = NULL, min.cols = NULL,
  max.cols = NULL, nrows = NULL, ncols = NULL, row.names = NULL,
  col.names = NULL, null.ok = FALSE, .var.name = vname(x),
  add = NULL)
```

```
assert_matrix(x, mode = NULL, any.missing = TRUE, all.missing = TRUE,
  min.rows = NULL, max.rows = NULL, min.cols = NULL,
  max.cols = NULL, nrows = NULL, ncols = NULL, row.names = NULL,
  col.names = NULL, null.ok = FALSE, .var.name = vname(x),
  add = NULL)
```

```
testMatrix(x, mode = NULL, any.missing = TRUE, all.missing = TRUE,
  min.rows = NULL, max.rows = NULL, min.cols = NULL,
  max.cols = NULL, nrows = NULL, ncols = NULL, row.names = NULL,
  col.names = NULL, null.ok = FALSE)
```

```
test_matrix(x, mode = NULL, any.missing = TRUE, all.missing = TRUE,
  min.rows = NULL, max.rows = NULL, min.cols = NULL,
  max.cols = NULL, nrows = NULL, ncols = NULL, row.names = NULL,
  col.names = NULL, null.ok = FALSE)
```

```
expect_matrix(x, mode = NULL, any.missing = TRUE, all.missing = TRUE,
  min.rows = NULL, max.rows = NULL, min.cols = NULL,
```

```
max.cols = NULL, nrows = NULL, ncols = NULL, row.names = NULL,
col.names = NULL, null.ok = FALSE, info = NULL, label = vname(x))
```

### Arguments

x	[any] Object to check.
mode	[character(1)] Storage mode of the array. Arrays can hold vectors, i.e. “logical”, “integer”, “integerish”, “double”, “numeric”, “complex”, “character” and “list”. You can also specify “atomic” here to explicitly prohibit lists. Default is NULL (no check).
any.missing	[logical(1)] Are missing values allowed? Default is TRUE.
all.missing	[logical(1)] Are matrices with only missing values allowed? Default is TRUE.
min.rows	[integer(1)] Minimum number of rows.
max.rows	[integer(1)] Maximum number of rows.
min.cols	[integer(1)] Minimum number of columns.
max.cols	[integer(1)] Maximum number of columns.
nrows	[integer(1)] Exact number of rows.
ncols	[integer(1)] Exact number of columns.
row.names	[character(1)] Check for row names. Default is “NULL” (no check). See <a href="#">checkNamed</a> for possible values. Note that you can use <a href="#">checkSubset</a> to check for a specific set of names.
col.names	[character(1)] Check for column names. Default is “NULL” (no check). See <a href="#">checkNamed</a> for possible values. Note that you can use <a href="#">checkSubset</a> to test for a specific set of names.
null.ok	[logical(1)] If set to TRUE, x may also be NULL. In this case only a type check of x is performed, all additional checks are disabled.
.var.name	[character(1)] Name of the checked object to print in assertions. Defaults to the heuristic implemented in <a href="#">vname</a> .
add	[AssertCollection] Collection to store assertion messages. See <a href="#">AssertCollection</a> .

info	[character(1)] Extra information to be included in the message for the testthat reporter. See <a href="#">expect_that</a> .
label	[character(1)] Name of the checked object to print in messages. Defaults to the heuristic implemented in <a href="#">vname</a> .

**Value**

Depending on the function prefix: If the check is successful, the functions `assertMatrix/assert_matrix` return `x` invisibly, whereas `checkMatrix/check_matrix` and `testMatrix/test_matrix` return `TRUE`. If the check is not successful, `assertMatrix/assert_matrix` throws an error message, `testMatrix/test_matrix` returns `FALSE`, and `checkMatrix` returns a string with the error message. The function `expect_matrix` always returns an [expectation](#).

**See Also**

Other basetypes: [checkArray](#), [checkAtomicVector](#), [checkAtomic](#), [checkCharacter](#), [checkComplex](#), [checkDataFrame](#), [checkDate](#), [checkDouble](#), [checkEnvironment](#), [checkFactor](#), [checkFormula](#), [checkFunction](#), [checkIntegerish](#), [checkInteger](#), [checkList](#), [checkLogical](#), [checkNull](#), [checkNumeric](#), [checkPOSIXct](#), [checkRaw](#), [checkVector](#)

Other compound: [checkArray](#), [checkDataFrame](#), [checkDataTable](#), [checkTibble](#)

**Examples**

```
x = matrix(1:9, 3)
colnames(x) = letters[1:3]
testMatrix(x, nrows = 3, min.cols = 1, col.names = "named")
```

---

checkMultiClass	<i>Check the class membership of an argument</i>
-----------------	--

---

**Description**

Check the class membership of an argument

**Usage**

```
checkMultiClass(x, classes, null.ok = FALSE)

check_multi_class(x, classes, null.ok = FALSE)

assertMultiClass(x, classes, null.ok = FALSE, .var.name = vname(x),
  add = NULL)

assert_multi_class(x, classes, null.ok = FALSE, .var.name = vname(x),
  add = NULL)
```

```
testMultiClass(x, classes, null.ok = FALSE)

test_multi_class(x, classes, null.ok = FALSE)

expect_multi_class(x, classes, null.ok = FALSE, info = NULL,
  label = vname(x))
```

### Arguments

x	[any] Object to check.
classes	[character] Class names to check for inheritance with <a href="#">inherits</a> . x must inherit from any of the specified classes.
null.ok	[logical(1)] If set to TRUE, x may also be NULL. In this case only a type check of x is performed, all additional checks are disabled.
.var.name	[character(1)] Name of the checked object to print in assertions. Defaults to the heuristic implemented in <a href="#">vname</a> .
add	[AssertCollection] Collection to store assertion messages. See <a href="#">AssertCollection</a> .
info	[character(1)] Extra information to be included in the message for the testthat reporter. See <a href="#">expect_that</a> .
label	[character(1)] Name of the checked object to print in messages. Defaults to the heuristic implemented in <a href="#">vname</a> .

### Value

Depending on the function prefix: If the check is successful, the functions `assertMultiClass/assert_multi_class` return x invisibly, whereas `checkMultiClass/check_multi_class` and `testMultiClass/test_multi_class` return TRUE. If the check is not successful, `assertMultiClass/assert_multi_class` throws an error message, `testMultiClass/test_multi_class` returns FALSE, and `checkMultiClass` returns a string with the error message. The function `expect_multi_class` always returns an [expectation](#).

### See Also

Other attributes: [checkClass](#), [checkNamed](#), [checkNames](#)  
Other classes: [checkClass](#), [checkR6](#)

### Examples

```
x = 1
class(x) = "bar"
```

```
checkMultiClass(x, c("foo", "bar"))
checkMultiClass(x, c("foo", "foobar"))
```

---

checkNamed	<i>Check if an argument is named</i>
------------	--------------------------------------

---

## Description

Check if an argument is named

## Usage

```
checkNamed(x, type = "named")
check_named(x, type = "named")
assertNamed(x, type = "named", .var.name = vname(x), add = NULL)
assert_named(x, type = "named", .var.name = vname(x), add = NULL)
testNamed(x, type = "named")
test_named(x, type = "named")
```

## Arguments

x	[any] Object to check.
type	[character(1)] Select the check(s) to perform. “unnamed” checks x to be unnamed. “named” (default) checks x to be named which excludes names to be NA or empty (“”). “unique” additionally tests for non-duplicated names. “strict” checks for unique names which comply to R’s variable name restrictions. Note that for zero-length x every name check evaluates to TRUE.
.var.name	[character(1)] Name of the checked object to print in assertions. Defaults to the heuristic implemented in <a href="#">vname</a> .
add	[AssertCollection] Collection to store assertion messages. See <a href="#">AssertCollection</a> .

## Value

Depending on the function prefix: If the check is successful, the functions `assertNamed/assert_named` return x invisibly, whereas `checkNamed/check_named` and `testNamed/test_named` return TRUE. If the check is not successful, `assertNamed/assert_named` throws an error message, `testNamed/test_named` returns FALSE, and `checkNamed` returns a string with the error message. The function `expect_named` always returns an [expectation](#).

**Note**

These function are deprecated and will be removed in a future version. Please use [checkNames](#) instead.

**See Also**

Other attributes: [checkClass](#), [checkMultiClass](#), [checkNames](#)

**Examples**

```
x = 1:3
testNamed(x, "unnamed")
names(x) = letters[1:3]
testNamed(x, "unique")
```

---

checkNames

*Check names to comply to specific rules*

---

**Description**

Performs various checks on character vectors, usually names.

**Usage**

```
checkNames(x, type = "named", subset.of = NULL, must.include = NULL,
  permutation.of = NULL, identical.to = NULL, disjunct.from = NULL,
  what = "names")
```

```
check_names(x, type = "named", subset.of = NULL, must.include = NULL,
  permutation.of = NULL, identical.to = NULL, disjunct.from = NULL,
  what = "names")
```

```
assertNames(x, type = "named", subset.of = NULL, must.include = NULL,
  permutation.of = NULL, identical.to = NULL, disjunct.from = NULL,
  what = "names", .var.name = vname(x), add = NULL)
```

```
assert_names(x, type = "named", subset.of = NULL,
  must.include = NULL, permutation.of = NULL, identical.to = NULL,
  disjunct.from = NULL, what = "names", .var.name = vname(x),
  add = NULL)
```

```
testNames(x, type = "named", subset.of = NULL, must.include = NULL,
  permutation.of = NULL, identical.to = NULL, disjunct.from = NULL,
  what = "names")
```

```
test_names(x, type = "named", subset.of = NULL, must.include = NULL,
  permutation.of = NULL, identical.to = NULL, disjunct.from = NULL,
```



```

what = "names")

expect_names(x, type = "named", subset.of = NULL,
  must.include = NULL, permutation.of = NULL, identical.to = NULL,
  disjunct.from = NULL, what = "names", info = NULL,
  label = vname(x))

```

## Arguments

x	[character   NULL] Names to check using rules defined via type.
type	[character(1)] Type of formal check(s) to perform on the names. <b>unnamed:</b> Checks x to be NULL. <b>named:</b> Checks x for regular names which excludes names to be NA or empty (""). <b>unique:</b> Performs checks like with “named” and additionally tests for non-duplicated names. <b>strict:</b> Performs checks like with “unique” and additionally fails for names with UTF-8 characters and names which do not comply to R’s variable name restrictions. As regular expression, this is “ <code>^[.]*[a-zA-Z]+[a-zA-Z0-9._]*\$</code> ”. <b>ids:</b> Same as “strict”, but does not enforce uniqueness. Note that for zero-length x, all these name checks evaluate to TRUE.
subset.of	[character] Names provided in x must be subset of the set subset.of.
must.include	[character] Names provided in x must be a superset of the set must.include.
permutation.of	[character] Names provided in x must be a permutation of the set permutation.of. Duplicated names in permutation.of are stripped out and duplicated names in x thus lead to a failed check. Use this argument instead of identical.to if the order of the names is not relevant.
identical.to	[character] Names provided in x must be identical to the vector identical.to. Use this argument instead of permutation.of if the order of the names is relevant.
disjunct.from	[character] Names provided in x must may not be present in the vector identical.to.
what	[character(1)] Type of name vector to check, e.g. “names” (default), “colnames” or “rownames”.
.var.name	[character(1)] Name of the checked object to print in assertions. Defaults to the heuristic implemented in <a href="#">vname</a> .
add	[AssertCollection] Collection to store assertion messages. See <a href="#">AssertCollection</a> .

info	[character(1)] Extra information to be included in the message for the testthat reporter. See <a href="#">expect_that</a> .
label	[character(1)] Name of the checked object to print in messages. Defaults to the heuristic implemented in <a href="#">vname</a> .

**Value**

Depending on the function prefix: If the check is successful, the functions `assertNamed/assert_named` return `x` invisibly, whereas `checkNamed/check_named` and `testNamed/test_named` return `TRUE`. If the check is not successful, `assertNamed/assert_named` throws an error message, `testNamed/test_named` returns `FALSE`, and `checkNamed` returns a string with the error message. The function `expect_named` always returns an [expectation](#).

**See Also**

Other attributes: [checkClass](#), [checkMultiClass](#), [checkNamed](#)

**Examples**

```
x = 1:3
testNames(x, "unnamed")
names(x) = letters[1:3]
testNames(x, "unique")
```

```
cn = c("Species", "Sepal.Length", "Sepal.Width", "Petal.Length", "Petal.Width")
assertNames(names(iris), permutation.of = cn)
```

---

checkNull	<i>Check if an argument is NULL</i>
-----------	-------------------------------------

---

**Description**

Check if an argument is NULL

**Usage**

```
checkNull(x)

check_null(x)

assertNull(x, .var.name = vname(x), add = NULL)

assert_null(x, .var.name = vname(x), add = NULL)

testNull(x)

test_null(x)
```

**Arguments**

x	[any] Object to check.
.var.name	[character(1)] Name of the checked object to print in assertions. Defaults to the heuristic implemented in <a href="#">vname</a> .
add	[AssertCollection] Collection to store assertion messages. See <a href="#">AssertCollection</a> .

**Value**

Depending on the function prefix: If the check is successful, the functions `assertNull/assert_null` return `x` invisibly, whereas `checkNull/check_null` and `testNull/test_null` return `TRUE`. If the check is not successful, `assertNull/assert_null` throws an error message, `testNull/test_null` returns `FALSE`, and `checkNull` returns a string with the error message. The function `expect_null` always returns an [expectation](#).

**See Also**

Other basetypes: [checkArray](#), [checkAtomicVector](#), [checkAtomic](#), [checkCharacter](#), [checkComplex](#), [checkDataFrame](#), [checkDate](#), [checkDouble](#), [checkEnvironment](#), [checkFactor](#), [checkFormula](#), [checkFunction](#), [checkIntegerish](#), [checkInteger](#), [checkList](#), [checkLogical](#), [checkMatrix](#), [checkNumeric](#), [checkPOSIXct](#), [checkRaw](#), [checkVector](#)

**Examples**

```
testNull(NULL)
testNull(1)
```

---

checkNumber	<i>Check if an argument is a single numeric value</i>
-------------	---

---

**Description**

Check if an argument is a single numeric value

**Usage**

```
checkNumber(x, na.ok = FALSE, lower = -Inf, upper = Inf,
  finite = FALSE, null.ok = FALSE)

check_number(x, na.ok = FALSE, lower = -Inf, upper = Inf,
  finite = FALSE, null.ok = FALSE)

assertNumber(x, na.ok = FALSE, lower = -Inf, upper = Inf,
  finite = FALSE, null.ok = FALSE, .var.name = vname(x),
  add = NULL)
```

```

assert_number(x, na.ok = FALSE, lower = -Inf, upper = Inf,
  finite = FALSE, null.ok = FALSE, .var.name = vname(x),
  add = NULL)

testNumber(x, na.ok = FALSE, lower = -Inf, upper = Inf,
  finite = FALSE, null.ok = FALSE)

test_number(x, na.ok = FALSE, lower = -Inf, upper = Inf,
  finite = FALSE, null.ok = FALSE)

expect_number(x, na.ok = FALSE, lower = -Inf, upper = Inf,
  finite = FALSE, null.ok = FALSE, info = NULL, label = vname(x))

```

### Arguments

x	[any] Object to check.
na.ok	[logical(1)] Are missing values allowed? Default is FALSE.
lower	[numeric(1)] Lower value all elements of x must be greater than or equal to.
upper	[numeric(1)] Upper value all elements of x must be lower than or equal to.
finite	[logical(1)] Check for only finite values? Default is FALSE.
null.ok	[logical(1)] If set to TRUE, x may also be NULL. In this case only a type check of x is performed, all additional checks are disabled.
.var.name	[character(1)] Name of the checked object to print in assertions. Defaults to the heuristic implemented in <a href="#">vname</a> .
add	[AssertCollection] Collection to store assertion messages. See <a href="#">AssertCollection</a> .
info	[character(1)] Extra information to be included in the message for the testthat reporter. See <a href="#">expect_that</a> .
label	[character(1)] Name of the checked object to print in messages. Defaults to the heuristic implemented in <a href="#">vname</a> .

### Details

This function does not distinguish between NA, NA\_integer\_, NA\_real\_, NA\_complex\_ NA\_character\_ and NaN.

**Value**

Depending on the function prefix: If the check is successful, the functions `assertNumber/assert_number` return `x` invisibly, whereas `checkNumber/check_number` and `testNumber/test_number` return `TRUE`. If the check is not successful, `assertNumber/assert_number` throws an error message, `testNumber/test_number` returns `FALSE`, and `checkNumber` returns a string with the error message. The function `expect_number` always returns an [expectation](#).

**See Also**

Other scalars: [checkCount](#), [checkFlag](#), [checkInt](#), [checkScalarNA](#), [checkScalar](#), [checkString](#)

**Examples**

```
testNumber(1)
testNumber(1:2)
```

---

checkNumeric

*Check that an argument is a vector of type numeric*

---

**Description**

Vectors of storage type “integer” and “double” count as “numeric”, c.f. [is.numeric](#). To explicitly check for real integer or double vectors, see [checkInteger](#), [checkIntegerish](#) or [checkDouble](#).

**Usage**

```
checkNumeric(x, lower = -Inf, upper = Inf, finite = FALSE,
  any.missing = TRUE, all.missing = TRUE, len = NULL,
  min.len = NULL, max.len = NULL, unique = FALSE, sorted = FALSE,
  names = NULL, null.ok = FALSE)
```

```
check_numeric(x, lower = -Inf, upper = Inf, finite = FALSE,
  any.missing = TRUE, all.missing = TRUE, len = NULL,
  min.len = NULL, max.len = NULL, unique = FALSE, sorted = FALSE,
  names = NULL, null.ok = FALSE)
```

```
assertNumeric(x, lower = -Inf, upper = Inf, finite = FALSE,
  any.missing = TRUE, all.missing = TRUE, len = NULL,
  min.len = NULL, max.len = NULL, unique = FALSE, sorted = FALSE,
  names = NULL, null.ok = FALSE, .var.name = vname(x), add = NULL)
```

```
assert_numeric(x, lower = -Inf, upper = Inf, finite = FALSE,
  any.missing = TRUE, all.missing = TRUE, len = NULL,
  min.len = NULL, max.len = NULL, unique = FALSE, sorted = FALSE,
  names = NULL, null.ok = FALSE, .var.name = vname(x), add = NULL)
```

```
testNumeric(x, lower = -Inf, upper = Inf, finite = FALSE,
```

```
any.missing = TRUE, all.missing = TRUE, len = NULL,
min.len = NULL, max.len = NULL, unique = FALSE, sorted = FALSE,
names = NULL, null.ok = FALSE)
```

```
test_numeric(x, lower = -Inf, upper = Inf, finite = FALSE,
any.missing = TRUE, all.missing = TRUE, len = NULL,
min.len = NULL, max.len = NULL, unique = FALSE, sorted = FALSE,
names = NULL, null.ok = FALSE)
```

```
expect_numeric(x, lower = -Inf, upper = Inf, finite = FALSE,
any.missing = TRUE, all.missing = TRUE, len = NULL,
min.len = NULL, max.len = NULL, unique = FALSE, sorted = FALSE,
names = NULL, null.ok = FALSE, info = NULL, label = vname(x))
```

### Arguments

x	[any] Object to check.
lower	[numeric(1)] Lower value all elements of x must be greater than or equal to.
upper	[numeric(1)] Upper value all elements of x must be lower than or equal to.
finite	[logical(1)] Check for only finite values? Default is FALSE.
any.missing	[logical(1)] Are vectors with missing values allowed? Default is TRUE.
all.missing	[logical(1)] Are vectors with only missing values allowed? Default is TRUE.
len	[integer(1)] Exact expected length of x.
min.len	[integer(1)] Minimal length of x.
max.len	[integer(1)] Maximal length of x.
unique	[logical(1)] Must all values be unique? Default is FALSE.
sorted	[logical(1)] Elements must be sorted in ascending order. Missing values are ignored.
names	[character(1)] Check for names. See <a href="#">checkNamed</a> for possible values. Default is “any” which performs no check at all. Note that you can use <a href="#">checkSubset</a> to check for a specific set of names.
null.ok	[logical(1)] If set to TRUE, x may also be NULL. In this case only a type check of x is performed, all additional checks are disabled.

.var.name	[character(1)] Name of the checked object to print in assertions. Defaults to the heuristic implemented in <a href="#">vname</a> .
add	[AssertCollection] Collection to store assertion messages. See <a href="#">AssertCollection</a> .
info	[character(1)] Extra information to be included in the message for the testthat reporter. See <a href="#">expect_that</a> .
label	[character(1)] Name of the checked object to print in messages. Defaults to the heuristic implemented in <a href="#">vname</a> .

**Details**

This function does not distinguish between NA, NA\_integer\_, NA\_real\_, NA\_complex\_ NA\_character\_ and NaN.

**Value**

Depending on the function prefix: If the check is successful, the functions `assertNumeric/assert_numeric` return `x` invisibly, whereas `checkNumeric/check_numeric` and `testNumeric/test_numeric` return `TRUE`. If the check is not successful, `assertNumeric/assert_numeric` throws an error message, `testNumeric/test_numeric` returns `FALSE`, and `checkNumeric` returns a string with the error message. The function `expect_numeric` always returns an [expectation](#).

**See Also**

Other basetypes: [checkArray](#), [checkAtomicVector](#), [checkAtomic](#), [checkCharacter](#), [checkComplex](#), [checkDataFrame](#), [checkDate](#), [checkDouble](#), [checkEnvironment](#), [checkFactor](#), [checkFormula](#), [checkFunction](#), [checkIntegerish](#), [checkInteger](#), [checkList](#), [checkLogical](#), [checkMatrix](#), [checkNull](#), [checkPOSIXct](#), [checkRaw](#), [checkVector](#)

**Examples**

```
testNumeric(1)
testNumeric(1, min.len = 1, lower = 0)
```

---

checkOS

*Check the operating system*

---

**Description**

Check the operating system

## Usage

checkOS(os)

check\_os(os)

assertOS(os, add = NULL, .var.name = NULL)

assert\_os(os, add = NULL, .var.name = NULL)

testOS(os)

test\_os(os)

expect\_os(os, info = NULL, label = NULL)

## Arguments

os	[character(1)] Check the operating system to be in a set with possible elements “windows”, “mac”, “linux” and “solaris”.
add	[AssertCollection] Collection to store assertion messages. See <a href="#">AssertCollection</a> .
.var.name	[character(1)] Name of the checked object to print in assertions. Defaults to the heuristic implemented in <a href="#">vname</a> .
info	[character(1)] Extra information to be included in the message for the testthat reporter. See <a href="#">expect_that</a> .
label	[character(1)] Name of the checked object to print in messages. Defaults to the heuristic implemented in <a href="#">vname</a> .

## Value

Depending on the function prefix: If the check is successful, the functions `assertOS/assert_os` return `x` invisibly, whereas `checkOS/check_os` and `testOS/test_os` return `TRUE`. If the check is not successful, `assertOS/assert_os` throws an error message, `testOS/test_os` returns `FALSE`, and `checkOS` returns a string with the error message. The function `expect_os` always returns an [expectation](#).

## Examples

```
testOS("linux")
```



---

checkPathForOutput      *Check if a path is suited for creating an output file*

---

### Description

Check if a file path can be used safely to create a file and write to it.

This is checked:

- Does `dirname(x)` exist?
- Does no file under path `x` exist?
- Is `dirname(x)` writable?

Paths are relative to the current working directory.

### Usage

```
checkPathForOutput(x, overwrite = FALSE, extension = NULL)
```

```
check_path_for_output(x, overwrite = FALSE, extension = NULL)
```

```
assertPathForOutput(x, overwrite = FALSE, extension = NULL,
  .var.name = vname(x), add = NULL)
```

```
assert_path_for_output(x, overwrite = FALSE, extension = NULL,
  .var.name = vname(x), add = NULL)
```

```
testPathForOutput(x, overwrite = FALSE, extension = NULL)
```

```
test_path_for_output(x, overwrite = FALSE, extension = NULL)
```

```
expect_path_for_output(x, overwrite = FALSE, extension = NULL,
  info = NULL, label = vname(x))
```

### Arguments

<code>x</code>	[any] Object to check.
<code>overwrite</code>	[logical(1)] If TRUE, an existing file in place is allowed if it is both readable and writable. Default is FALSE.
<code>extension</code>	[character(1)] Extension of the file, e.g. <code>dQuote</code> txt or "tar.gz".
<code>.var.name</code>	[character(1)] Name of the checked object to print in assertions. Defaults to the heuristic implemented in <code>vname</code> .

add	[AssertCollection] Collection to store assertion messages. See <a href="#">AssertCollection</a> .
info	[character(1)] Extra information to be included in the message for the testthat reporter. See <a href="#">expect_that</a> .
label	[character(1)] Name of the checked object to print in messages. Defaults to the heuristic implemented in <a href="#">vname</a> .

### Value

Depending on the function prefix: If the check is successful, the functions `assertPathForOutput/assert_path_for_output` return `x` invisibly, whereas `checkPathForOutput/check_path_for_output` and `testPathForOutput/test_path_for_output` return `TRUE`. If the check is not successful, `assertPathForOutput/assert_path_for_output` throws an error message, `testPathForOutput/test_path_for_output` returns `FALSE`, and `checkPathForOutput` returns a string with the error message. The function `expect_path_for_output` always returns an [expectation](#).

### See Also

Other filesystem: [checkAccess](#), [checkDirectoryExists](#), [checkFileExists](#)

### Examples

```
# Can we create a file in the tempdir?
testPathForOutput(file.path(tempdir(), "process.log"))
```

---

checkPOSIXct	<i>Check that an argument is a date/time object in POSIXct format</i>
--------------	---

---

### Description

Checks that an object is of class [POSIXct](#).

### Usage

```
checkPOSIXct(x, lower = NULL, upper = NULL, any.missing = TRUE,
  all.missing = TRUE, len = NULL, min.len = NULL, max.len = NULL,
  unique = FALSE, sorted = FALSE, null.ok = FALSE)
```

```
check_posixct(x, lower = NULL, upper = NULL, any.missing = TRUE,
  all.missing = TRUE, len = NULL, min.len = NULL, max.len = NULL,
  unique = FALSE, sorted = FALSE, null.ok = FALSE)
```

```
assertPOSIXct(x, lower = NULL, upper = NULL, any.missing = TRUE,
  all.missing = TRUE, len = NULL, min.len = NULL, max.len = NULL,
  unique = FALSE, sorted = FALSE, null.ok = FALSE,
```

```

    .var.name = vname(x), add = NULL)

assert_posixct(x, lower = NULL, upper = NULL, any.missing = TRUE,
  all.missing = TRUE, len = NULL, min.len = NULL, max.len = NULL,
  unique = FALSE, sorted = FALSE, null.ok = FALSE,
  .var.name = vname(x), add = NULL)

testPOSIXct(x, lower = NULL, upper = NULL, any.missing = TRUE,
  all.missing = TRUE, len = NULL, min.len = NULL, max.len = NULL,
  unique = FALSE, sorted = FALSE, null.ok = FALSE)

test_posixct(x, lower = NULL, upper = NULL, any.missing = TRUE,
  all.missing = TRUE, len = NULL, min.len = NULL, max.len = NULL,
  unique = FALSE, sorted = FALSE, null.ok = FALSE)

expect_posixct(x, lower = NULL, upper = NULL, any.missing = TRUE,
  all.missing = TRUE, len = NULL, min.len = NULL, max.len = NULL,
  unique = FALSE, sorted = FALSE, null.ok = FALSE, info = NULL,
  label = vname(x))

```

### Arguments

x	[any] Object to check.
lower	[Date] All non-missing dates in x must be >= this POSIXct time. Must be provided in the same timezone as x.
upper	[Date] All non-missing dates in x must be <= this POSIXct time. Must be provided in the same timezone as x.
any.missing	[logical(1)] Are vectors with missing values allowed? Default is TRUE.
all.missing	[logical(1)] Are vectors with only missing values allowed? Default is TRUE.
len	[integer(1)] Exact expected length of x.
min.len	[integer(1)] Minimal length of x.
max.len	[integer(1)] Maximal length of x.
unique	[logical(1)] Must all values be unique? Default is FALSE.
sorted	[logical(1)] Elements must be sorted in ascending order. Missing values are ignored.
null.ok	[logical(1)] If set to TRUE, x may also be NULL. In this case only a type check of x is performed, all additional checks are disabled.

<code>.var.name</code>	[character(1)] Name of the checked object to print in assertions. Defaults to the heuristic implemented in <code>vname</code> .
<code>add</code>	[AssertCollection] Collection to store assertion messages. See <a href="#">AssertCollection</a> .
<code>info</code>	[character(1)] Extra information to be included in the message for the testthat reporter. See <a href="#">expect_that</a> .
<code>label</code>	[character(1)] Name of the checked object to print in messages. Defaults to the heuristic implemented in <code>vname</code> .

### Value

Depending on the function prefix: If the check is successful, the functions `assertAtomic/assert_atomic` return `x` invisibly, whereas `checkAtomic/check_atomic` and `testAtomic/test_atomic` return `TRUE`. If the check is not successful, `assertAtomic/assert_atomic` throws an error message, `testAtomic/test_atomic` returns `FALSE`, and `checkAtomic` returns a string with the error message. The function `expect_atomic` always returns an [expectation](#).

### See Also

Other basetypes: [checkArray](#), [checkAtomicVector](#), [checkAtomic](#), [checkCharacter](#), [checkComplex](#), [checkDataFrame](#), [checkDate](#), [checkDouble](#), [checkEnvironment](#), [checkFactor](#), [checkFormula](#), [checkFunction](#), [checkIntegerish](#), [checkInteger](#), [checkList](#), [checkLogical](#), [checkMatrix](#), [checkNull](#), [checkNumeric](#), [checkRaw](#), [checkVector](#)

---

<code>checkR6</code>	<i>Check if an argument is a R6 class</i>
----------------------	---

---

### Description

Check if an argument is a R6 class

### Usage

```
checkR6(x, classes = NULL, ordered = FALSE, cloneable = NULL,
        public = NULL, private = NULL, null.ok = FALSE)

check_r6(x, classes = NULL, ordered = FALSE, cloneable = NULL,
         public = NULL, private = NULL, null.ok = FALSE)

assertR6(x, classes = NULL, ordered = FALSE, cloneable = NULL,
         public = NULL, private = NULL, null.ok = FALSE,
         .var.name = vname(x), add = NULL)
```

```
assert_r6(x, classes = NULL, ordered = FALSE, cloneable = NULL,
  public = NULL, private = NULL, null.ok = FALSE,
  .var.name = vname(x), add = NULL)
```

```
testR6(x, classes = NULL, ordered = FALSE, cloneable = NULL,
  public = NULL, private = NULL, null.ok = FALSE)
```

```
test_r6(x, classes = NULL, ordered = FALSE, cloneable = NULL,
  public = NULL, private = NULL, null.ok = FALSE)
```

```
expect_r6(x, classes = NULL, ordered = FALSE, cloneable = NULL,
  public = NULL, private = NULL, null.ok = FALSE, info = NULL,
  label = vname(x))
```

### Arguments

x	[any] Object to check.
classes	[character] Class names to check for inheritance with <a href="#">inherits</a> . x must inherit from all specified classes.
ordered	[logical(1)] Expect x to be specialized in provided order. Default is FALSE.
cloneable	[logical(1)] If TRUE, check that x has a clone method. If FALSE, ensure that x is not cloneable.
public	[character] Names of expected public slots. This includes active bindings.
private	[character] Names of expected private slots.
null.ok	[logical(1)] If set to TRUE, x may also be NULL. In this case only a type check of x is performed, all additional checks are disabled.
.var.name	[character(1)] Name of the checked object to print in assertions. Defaults to the heuristic implemented in <a href="#">vname</a> .
add	[AssertCollection] Collection to store assertion messages. See <a href="#">AssertCollection</a> .
info	[character(1)] Extra information to be included in the message for the testthat reporter. See <a href="#">expect_that</a> .
label	[character(1)] Name of the checked object to print in messages. Defaults to the heuristic implemented in <a href="#">vname</a> .

**Value**

Depending on the function prefix: If the check is successful, the functions `assertClass/assert_class` return `x` invisibly, whereas `checkClass/check_class` and `testClass/test_class` return `TRUE`. If the check is not successful, `assertClass/assert_class` throws an error message, `testClass/test_class` returns `FALSE`, and `checkClass` returns a string with the error message. The function `expect_class` always returns an [expectation](#).

**See Also**

Other classes: [checkClass](#), [checkMultiClass](#)

**Examples**

```
library(R6)
generator = R6Class("Bar",
  public = list(a = 5),
  private = list(b = 42),
  active = list(c = function() 99)
)
x = generator$new()
checkR6(x, "Bar", cloneable = TRUE, public = "a")
```

---

checkRaw

*Check if an argument is a raw vector*

---

**Description**

Check if an argument is a raw vector

**Usage**

```
checkRaw(x, len = NULL, min.len = NULL, max.len = NULL,
  names = NULL, null.ok = FALSE)
```

```
check_raw(x, len = NULL, min.len = NULL, max.len = NULL,
  names = NULL, null.ok = FALSE)
```

```
assertRaw(x, len = NULL, min.len = NULL, max.len = NULL,
  names = NULL, null.ok = FALSE, .var.name = vname(x), add = NULL)
```

```
assert_raw(x, len = NULL, min.len = NULL, max.len = NULL,
  names = NULL, null.ok = FALSE, .var.name = vname(x), add = NULL)
```

```
testRaw(x, len = NULL, min.len = NULL, max.len = NULL,
  names = NULL, null.ok = FALSE)
```

```
test_raw(x, len = NULL, min.len = NULL, max.len = NULL,
```

```

names = NULL, null.ok = FALSE)

expect_raw(x, len = NULL, min.len = NULL, max.len = NULL,
names = NULL, null.ok = FALSE, info = NULL, label = vname(x))

```

### Arguments

x	[any] Object to check.
len	[integer(1)] Exact expected length of x.
min.len	[integer(1)] Minimal length of x.
max.len	[integer(1)] Maximal length of x.
names	[character(1)] Check for names. See <a href="#">checkNamed</a> for possible values. Default is “any” which performs no check at all. Note that you can use <a href="#">checkSubset</a> to check for a specific set of names.
null.ok	[logical(1)] If set to TRUE, x may also be NULL. In this case only a type check of x is performed, all additional checks are disabled.
.var.name	[character(1)] Name of the checked object to print in assertions. Defaults to the heuristic implemented in <a href="#">vname</a> .
add	[AssertCollection] Collection to store assertion messages. See <a href="#">AssertCollection</a> .
info	[character(1)] Extra information to be included in the message for the testthat reporter. See <a href="#">expect_that</a> .
label	[character(1)] Name of the checked object to print in messages. Defaults to the heuristic implemented in <a href="#">vname</a> .

### Value

Depending on the function prefix: If the check is successful, the functions `assertRaw/assert_raw` return x invisibly, whereas `checkRaw/check_raw` and `testRaw/test_raw` return TRUE. If the check is not successful, `assertRaw/assert_raw` throws an error message, `testRaw/test_raw` returns FALSE, and `checkRaw` returns a string with the error message. The function `expect_raw` always returns an [expectation](#).

### See Also

Other basetypes: [checkArray](#), [checkAtomicVector](#), [checkAtomic](#), [checkCharacter](#), [checkComplex](#), [checkDataFrame](#), [checkDate](#), [checkDouble](#), [checkEnvironment](#), [checkFactor](#), [checkFormula](#), [checkFunction](#), [checkIntegerish](#), [checkInteger](#), [checkList](#), [checkLogical](#), [checkMatrix](#), [checkNull](#), [checkNumeric](#), [checkPOSIXct](#), [checkVector](#)

**Examples**

```
testRaw(as.raw(2), min.len = 1L)
```

---

checkScalar	<i>Check if an argument is a single atomic value</i>
-------------	--

---

**Description**

Check if an argument is a single atomic value

**Usage**

```
checkScalar(x, na.ok = FALSE, null.ok = FALSE)
```

```
check_scalar(x, na.ok = FALSE, null.ok = FALSE)
```

```
assertScalar(x, na.ok = FALSE, null.ok = FALSE, .var.name = vname(x),
  add = NULL)
```

```
assert_scalar(x, na.ok = FALSE, null.ok = FALSE,
  .var.name = vname(x), add = NULL)
```

```
testScalar(x, na.ok = FALSE, null.ok = FALSE)
```

```
test_scalar(x, na.ok = FALSE, null.ok = FALSE)
```

```
expect_scalar(x, na.ok = FALSE, null.ok = FALSE, info = NULL,
  label = vname(x))
```

**Arguments**

x	[any] Object to check.
na.ok	[logical(1)] Are missing values allowed? Default is FALSE.
null.ok	[logical(1)] If set to TRUE, x may also be NULL. In this case only a type check of x is performed, all additional checks are disabled.
.var.name	[character(1)] Name of the checked object to print in assertions. Defaults to the heuristic implemented in <a href="#">vname</a> .
add	[AssertCollection] Collection to store assertion messages. See <a href="#">AssertCollection</a> .
info	[character(1)] Extra information to be included in the message for the testthat reporter. See <a href="#">expect_that</a> .



label [character(1)]  
Name of the checked object to print in messages. Defaults to the heuristic implemented in [vname](#).

### Details

This function does not distinguish between NA, NA\_integer\_, NA\_real\_, NA\_complex\_, NA\_character\_ and NaN.

### Value

Depending on the function prefix: If the check is successful, the functions `assertScalar/assert_scalar` return `x` invisibly, whereas `checkScalar/check_scalar` and `testScalar/test_scalar` return `TRUE`. If the check is not successful, `assertScalar/assert_scalar` throws an error message, `testScalar/test_scalar` returns `FALSE`, and `checkScalar` returns a string with the error message. The function `expect_scalar` always returns an [expectation](#).

### See Also

Other scalars: [checkCount](#), [checkFlag](#), [checkInt](#), [checkNumber](#), [checkScalarNA](#), [checkString](#)

### Examples

```
testScalar(1)
testScalar(1:10)
```

---

checkScalarNA	<i>Check if an argument is a single missing value</i>
---------------	---

---

### Description

Check if an argument is a single missing value

### Usage

```
checkScalarNA(x, null.ok = FALSE)

check_scalar_na(x, null.ok = FALSE)

assertScalarNA(x, null.ok = FALSE, .var.name = vname(x), add = NULL)

assert_scalar_na(x, null.ok = FALSE, .var.name = vname(x),
  add = NULL)

testScalarNA(x, null.ok = FALSE)

test_scalar_na(x, null.ok = FALSE)

expect_scalar_na(x, null.ok = FALSE, info = NULL, label = vname(x))
```

**Arguments**

x	[any] Object to check.
null.ok	[logical(1)] If set to TRUE, x may also be NULL. In this case only a type check of x is performed, all additional checks are disabled.
.var.name	[character(1)] Name of the checked object to print in assertions. Defaults to the heuristic implemented in <a href="#">vname</a> .
add	[AssertCollection] Collection to store assertion messages. See <a href="#">AssertCollection</a> .
info	[character(1)] Extra information to be included in the message for the testthat reporter. See <a href="#">expect_that</a> .
label	[character(1)] Name of the checked object to print in messages. Defaults to the heuristic implemented in <a href="#">vname</a> .

**Value**

Depending on the function prefix: If the check is successful, the functions `assertScalarNA/assert_scalar_na` return x invisibly, whereas `checkScalarNA/check_scalar_na` and `testScalarNA/test_scalar_na` return TRUE. If the check is not successful, `assertScalarNA/assert_scalar_na` throws an error message, `testScalarNA/test_scalar_na` returns FALSE, and `checkScalarNA` returns a string with the error message. The function `expect_scalar_na` always returns an [expectation](#).

**See Also**

Other scalars: [checkCount](#), [checkFlag](#), [checkInt](#), [checkNumber](#), [checkScalar](#), [checkString](#)

**Examples**

```
testScalarNA(1)
testScalarNA(NA_real_)
testScalarNA(rep(NA, 2))
```

---

checkSetEqual

*Check if an argument is equal to a given set*

---

**Description**

Check if an argument is equal to a given set

**Usage**

```

checkSetEqual(x, y, ordered = FALSE, fmatch = FALSE)

check_set_equal(x, y, ordered = FALSE, fmatch = FALSE)

assertSetEqual(x, y, ordered = FALSE, fmatch = FALSE,
  .var.name = vname(x), add = NULL)

assert_set_equal(x, y, ordered = FALSE, fmatch = FALSE,
  .var.name = vname(x), add = NULL)

testSetEqual(x, y, ordered = FALSE, fmatch = FALSE)

test_set_equal(x, y, ordered = FALSE, fmatch = FALSE)

expect_set_equal(x, y, ordered = FALSE, fmatch = FALSE, info = NULL,
  label = vname(x))

```

**Arguments**

x	[any] Object to check.
y	[atomic] Set to compare with.
ordered	[logical(1)] Check x to have the same length and order as y, i.e. check using “==” while handling NAs nicely. Default is FALSE.
fmatch	[logical(1)] Use the set operations implemented in <code>fmatch</code> in package <b>fastmatch</b> . If <b>fastmatch</b> is not installed, this silently falls back to <code>match</code> . <code>fmatch</code> modifies y by reference: A hash table is added as attribute which is used in subsequent calls.
.var.name	[character(1)] Name of the checked object to print in assertions. Defaults to the heuristic implemented in <code>vname</code> .
add	[AssertCollection] Collection to store assertion messages. See <a href="#">AssertCollection</a> .
info	[character(1)] Extra information to be included in the message for the testthat reporter. See <a href="#">expect_that</a> .
label	[character(1)] Name of the checked object to print in messages. Defaults to the heuristic implemented in <code>vname</code> .

**Value**

Depending on the function prefix: If the check is successful, the functions `assertSubset/assert_subset` return x invisibly, whereas `checkSubset/check_subset` and `testSubset/test_subset` return TRUE.

If the check is not successful, `assertSubset/assert_subset` throws an error message, `testSubset/test_subset` returns `FALSE`, and `checkSubset` returns a string with the error message. The function `expect_subset` always returns an [expectation](#).

### Note

The object `x` must be of the same type as the set w.r.t. `typeof`. Integers and doubles are both treated as numeric.

### See Also

Other set: [checkChoice](#), [checkDisjunct](#), [checkSubset](#)

### Examples

```
testSetEqual(c("a", "b"), c("a", "b"))
testSetEqual(1:3, 1:4)

# x is not converted before the comparison (except for numerics)
testSetEqual(factor("a"), "a")
testSetEqual(1, "1")
testSetEqual(1, as.integer(1))
```

---

checkString	<i>Check if an argument is a string</i>
-------------	---

---

### Description

A string is defined as a scalar character vector.

### Usage

```
checkString(x, na.ok = FALSE, min.chars = NULL, pattern = NULL,
  fixed = NULL, ignore.case = FALSE, null.ok = FALSE)

check_string(x, na.ok = FALSE, min.chars = NULL, pattern = NULL,
  fixed = NULL, ignore.case = FALSE, null.ok = FALSE)

assertString(x, na.ok = FALSE, min.chars = NULL, pattern = NULL,
  fixed = NULL, ignore.case = FALSE, null.ok = FALSE,
  .var.name = vname(x), add = NULL)

assert_string(x, na.ok = FALSE, min.chars = NULL, pattern = NULL,
  fixed = NULL, ignore.case = FALSE, null.ok = FALSE,
  .var.name = vname(x), add = NULL)

testString(x, na.ok = FALSE, min.chars = NULL, pattern = NULL,
  fixed = NULL, ignore.case = FALSE, null.ok = FALSE)
```

```
test_string(x, na.ok = FALSE, min.chars = NULL, pattern = NULL,
  fixed = NULL, ignore.case = FALSE, null.ok = FALSE)
```

```
expect_string(x, na.ok = FALSE, min.chars = NULL, pattern = NULL,
  fixed = NULL, ignore.case = FALSE, null.ok = FALSE, info = NULL,
  label = vname(x))
```

## Arguments

x	[any] Object to check.
na.ok	[logical(1)] Are missing values allowed? Default is FALSE.
min.chars	[integer(1)] Minimum number of characters for each element of x.
pattern	[character(1L)] Regular expression as used in <a href="#">grepl</a> . All non-missing elements of x must comply to this pattern.
fixed	[character(1)] Substring to detect in x. Will be used as pattern in <a href="#">grepl</a> with option fixed set to TRUE. All non-missing elements of x must contain this substring.
ignore.case	[logical(1)] See <a href="#">grepl</a> . Default is FALSE.
null.ok	[logical(1)] If set to TRUE, x may also be NULL. In this case only a type check of x is performed, all additional checks are disabled.
.var.name	[character(1)] Name of the checked object to print in assertions. Defaults to the heuristic implemented in <a href="#">vname</a> .
add	[AssertCollection] Collection to store assertion messages. See <a href="#">AssertCollection</a> .
info	[character(1)] Extra information to be included in the message for the testthat reporter. See <a href="#">expect_that</a> .
label	[character(1)] Name of the checked object to print in messages. Defaults to the heuristic implemented in <a href="#">vname</a> .

## Details

This function does not distinguish between NA, NA\_integer\_, NA\_real\_, NA\_complex\_, NA\_character\_ and NaN.

**Value**

Depending on the function prefix: If the check is successful, the functions `assertString/assert_string` return `x` invisibly, whereas `checkString/check_string` and `testString/test_string` return `TRUE`. If the check is not successful, `assertString/assert_string` throws an error message, `testString/test_string` returns `FALSE`, and `checkString` returns a string with the error message. The function `expect_string` always returns an [expectation](#).

**See Also**

Other scalars: [checkCount](#), [checkFlag](#), [checkInt](#), [checkNumber](#), [checkScalarNA](#), [checkScalar](#)

**Examples**

```
testString("a")
testString(letters)
```

---

checkSubset	<i>Check if an argument is a subset of a given set</i>
-------------	--

---

**Description**

Check if an argument is a subset of a given set

**Usage**

```
checkSubset(x, choices, empty.ok = TRUE, fmatch = FALSE)
check_subset(x, choices, empty.ok = TRUE, fmatch = FALSE)
assertSubset(x, choices, empty.ok = TRUE, fmatch = FALSE,
  .var.name = vname(x), add = NULL)
assert_subset(x, choices, empty.ok = TRUE, fmatch = FALSE,
  .var.name = vname(x), add = NULL)
testSubset(x, choices, empty.ok = TRUE, fmatch = FALSE)
test_subset(x, choices, empty.ok = TRUE, fmatch = FALSE)
expect_subset(x, choices, empty.ok = TRUE, fmatch = FALSE,
  info = NULL, label = vname(x))
```

**Arguments**

x	[any] Object to check.
---	---------------------------

choices	[atomic] Set of possible values. May be empty.
empty.ok	[logical(1)] Treat zero-length x as subset of any set choices (this includes NULL)? Default is TRUE.
fmatch	[logical(1)] Use the set operations implemented in <code>fmatch</code> in package <b>fastmatch</b> . If <b>fastmatch</b> is not installed, this silently falls back to <code>match</code> . <code>fmatch</code> modifies y by reference: A hash table is added as attribute which is used in subsequent calls.
.var.name	[character(1)] Name of the checked object to print in assertions. Defaults to the heuristic implemented in <code>vname</code> .
add	[AssertCollection] Collection to store assertion messages. See <a href="#">AssertCollection</a> .
info	[character(1)] Extra information to be included in the message for the testthat reporter. See <a href="#">expect_that</a> .
label	[character(1)] Name of the checked object to print in messages. Defaults to the heuristic implemented in <code>vname</code> .

### Value

Depending on the function prefix: If the check is successful, the functions `assertSubset/assert_subset` return x invisibly, whereas `checkSubset/check_subset` and `testSubset/test_subset` return TRUE. If the check is not successful, `assertSubset/assert_subset` throws an error message, `testSubset/test_subset` returns FALSE, and `checkSubset` returns a string with the error message. The function `expect_subset` always returns an [expectation](#).

### Note

The object x must be of the same type as the set w.r.t. [typeof](#). Integers and doubles are both treated as numeric.

### See Also

Other set: [checkChoice](#), [checkDisjunct](#), [checkSetEqual](#)

### Examples

```
testSubset(c("a", "z"), letters)
testSubset("ab", letters)
testSubset("Species", names(iris))

# x is not converted before the comparison (except for numerics)
testSubset(factor("a"), "a")
testSubset(1, "1")
testSubset(1, as.integer(1))
```

---

`checkTibble`*Check if an argument is a tibble*

---

**Description**

Check if an argument is a tibble

**Usage**

```
checkTibble(x, types = character(0L), any.missing = TRUE,  
  all.missing = TRUE, min.rows = NULL, max.rows = NULL,  
  min.cols = NULL, max.cols = NULL, nrows = NULL, ncols = NULL,  
  row.names = NULL, col.names = NULL, null.ok = FALSE)
```

```
check_tibble(x, types = character(0L), any.missing = TRUE,  
  all.missing = TRUE, min.rows = NULL, max.rows = NULL,  
  min.cols = NULL, max.cols = NULL, nrows = NULL, ncols = NULL,  
  row.names = NULL, col.names = NULL, null.ok = FALSE)
```

```
assertTibble(x, types = character(0L), any.missing = TRUE,  
  all.missing = TRUE, min.rows = NULL, max.rows = NULL,  
  min.cols = NULL, max.cols = NULL, nrows = NULL, ncols = NULL,  
  row.names = NULL, col.names = NULL, null.ok = FALSE,  
  .var.name = vname(x), add = NULL)
```

```
assert_tibble(x, types = character(0L), any.missing = TRUE,  
  all.missing = TRUE, min.rows = NULL, max.rows = NULL,  
  min.cols = NULL, max.cols = NULL, nrows = NULL, ncols = NULL,  
  row.names = NULL, col.names = NULL, null.ok = FALSE,  
  .var.name = vname(x), add = NULL)
```

```
testTibble(x, types = character(0L), any.missing = TRUE,  
  all.missing = TRUE, min.rows = NULL, max.rows = NULL,  
  min.cols = NULL, max.cols = NULL, nrows = NULL, ncols = NULL,  
  row.names = NULL, col.names = NULL, null.ok = FALSE)
```

```
test_tibble(x, types = character(0L), any.missing = TRUE,  
  all.missing = TRUE, min.rows = NULL, max.rows = NULL,  
  min.cols = NULL, max.cols = NULL, nrows = NULL, ncols = NULL,  
  row.names = NULL, col.names = NULL, null.ok = FALSE)
```

```
expect_tibble(x, types = character(0L), any.missing = TRUE,  
  all.missing = TRUE, min.rows = NULL, max.rows = NULL,  
  min.cols = NULL, max.cols = NULL, nrows = NULL, ncols = NULL,  
  row.names = NULL, col.names = NULL, null.ok = FALSE, info = NULL,  
  label = vname(x))
```



**Arguments**

x	[any] Object to check.
types	[character] Character vector of class names. Each list element must inherit from at least one of the provided types. The types “logical”, “integer”, “integerish”, “double”, “numeric”, “complex”, “character”, “factor”, “atomic”, “vector”, “atomicvector”, “array”, “matrix”, “list”, “function”, “environment” and “null” are supported. For other types <a href="#">inherits</a> is used as a fallback to check x’s inheritance. Defaults to character(0) (no check).
any.missing	[logical(1)] Are missing values allowed? Default is TRUE.
all.missing	[logical(1)] Are matrices with only missing values allowed? Default is TRUE.
min.rows	[integer(1)] Minimum number of rows.
max.rows	[integer(1)] Maximum number of rows.
min.cols	[integer(1)] Minimum number of columns.
max.cols	[integer(1)] Maximum number of columns.
nrows	[integer(1)] Exact number of rows.
ncols	[integer(1)] Exact number of columns.
row.names	[character(1)] Check for row names. Default is “NULL” (no check). See <a href="#">checkNamed</a> for possible values. Note that you can use <a href="#">checkSubset</a> to check for a specific set of names.
col.names	[character(1)] Check for column names. Default is “NULL” (no check). See <a href="#">checkNamed</a> for possible values. Note that you can use <a href="#">checkSubset</a> to test for a specific set of names.
null.ok	[logical(1)] If set to TRUE, x may also be NULL. In this case only a type check of x is performed, all additional checks are disabled.
.var.name	[character(1)] Name of the checked object to print in assertions. Defaults to the heuristic implemented in <a href="#">vname</a> .
add	[AssertCollection] Collection to store assertion messages. See <a href="#">AssertCollection</a> .

info	[character(1)] Extra information to be included in the message for the testthat reporter. See <a href="#">expect_that</a> .
label	[character(1)] Name of the checked object to print in messages. Defaults to the heuristic implemented in <a href="#">vname</a> .

**Value**

Depending on the function prefix: If the check is successful, the functions `assertTibble/assert_tibble` return `x` invisibly, whereas `checkTibble/check_tibble` and `testTibble/test_tibble` return `TRUE`. If the check is not successful, `assertTibble/assert_tibble` throws an error message, `testTibble/test_tibble` returns `FALSE`, and `checkTibble` returns a string with the error message. The function `expect_tibble` always returns an [expectation](#).

**See Also**

Other compound: [checkArray](#), [checkDataFrame](#), [checkDataTable](#), [checkMatrix](#)

**Examples**

```
library(tibble)
x = as_tibble(iris)
testTibble(x)
testTibble(x, nrow = 150, any.missing = FALSE)
```

---

checkTRUE	<i>Check if an argument is TRUE</i>
-----------	-------------------------------------

---

**Description**

Simply checks if an argument is `TRUE`.

**Usage**

```
checkTRUE(x, na.ok = FALSE)

check_true(x, na.ok = FALSE)

assertTRUE(x, na.ok = FALSE, .var.name = vname(x), add = NULL)

assert_true(x, na.ok = FALSE, .var.name = vname(x), add = NULL)

testTRUE(x, na.ok = FALSE)

test_true(x, na.ok = FALSE)
```

**Arguments**

x	[any] Object to check.
na.ok	[logical(1)] Are missing values allowed? Default is FALSE.
.var.name	[character(1)] Name of the checked object to print in assertions. Defaults to the heuristic implemented in <a href="#">vname</a> .
add	[AssertCollection] Collection to store assertion messages. See <a href="#">AssertCollection</a> .

**Value**

Depending on the function prefix: If the check is successful, the functions `assertTRUE./assert_true.` return `x` invisibly, whereas `checkTRUE./check_true.` and `testTRUE./test_true.` return `TRUE`. If the check is not successful, `assertTRUE./assert_true.` throws an error message, `testTRUE./test_true.` returns `FALSE`, and `checkTRUE.` returns a string with the error message. The function `expect_true.` always returns an [expectation](#).

**Examples**

```
testTRUE(TRUE)
testTRUE(FALSE)
```

---

checkVector	<i>Check if an argument is a vector</i>
-------------	---

---

**Description**

Check if an argument is a vector

**Usage**

```
checkVector(x, strict = FALSE, any.missing = TRUE,
  all.missing = TRUE, len = NULL, min.len = NULL, max.len = NULL,
  unique = FALSE, names = NULL, null.ok = FALSE)
```

```
check_vector(x, strict = FALSE, any.missing = TRUE,
  all.missing = TRUE, len = NULL, min.len = NULL, max.len = NULL,
  unique = FALSE, names = NULL, null.ok = FALSE)
```

```
assertVector(x, strict = FALSE, any.missing = TRUE,
  all.missing = TRUE, len = NULL, min.len = NULL, max.len = NULL,
  unique = FALSE, names = NULL, null.ok = FALSE,
  .var.name = vname(x), add = NULL)
```

```

assert_vector(x, strict = FALSE, any.missing = TRUE,
  all.missing = TRUE, len = NULL, min.len = NULL, max.len = NULL,
  unique = FALSE, names = NULL, null.ok = FALSE,
  .var.name = vname(x), add = NULL)

testVector(x, strict = FALSE, any.missing = TRUE, all.missing = TRUE,
  len = NULL, min.len = NULL, max.len = NULL, unique = FALSE,
  names = NULL, null.ok = FALSE)

test_vector(x, strict = FALSE, any.missing = TRUE,
  all.missing = TRUE, len = NULL, min.len = NULL, max.len = NULL,
  unique = FALSE, names = NULL, null.ok = FALSE)

```

### Arguments

x	[any] Object to check.
strict	[logical(1)] May the vector have additional attributes? If TRUE, mimics the behavior of <a href="#">is.vector</a> . Default is FALSE which allows e.g. factors or data.frames to be recognized as vectors.
any.missing	[logical(1)] Are vectors with missing values allowed? Default is TRUE.
all.missing	[logical(1)] Are vectors with only missing values allowed? Default is TRUE.
len	[integer(1)] Exact expected length of x.
min.len	[integer(1)] Minimal length of x.
max.len	[integer(1)] Maximal length of x.
unique	[logical(1)] Must all values be unique? Default is FALSE.
names	[character(1)] Check for names. See <a href="#">checkNamed</a> for possible values. Default is “any” which performs no check at all. Note that you can use <a href="#">checkSubset</a> to check for a specific set of names.
null.ok	[logical(1)] If set to TRUE, x may also be NULL. In this case only a type check of x is performed, all additional checks are disabled.
.var.name	[character(1)] Name of the checked object to print in assertions. Defaults to the heuristic implemented in <a href="#">vname</a> .
add	[AssertCollection] Collection to store assertion messages. See <a href="#">AssertCollection</a> .

**Value**

Depending on the function prefix: If the check is successful, the functions `assertVector/assert_vector` return `x` invisibly, whereas `checkVector/check_vector` and `testVector/test_vector` return `TRUE`. If the check is not successful, `assertVector/assert_vector` throws an error message, `testVector/test_vector` returns `FALSE`, and `checkVector` returns a string with the error message. The function `expect_vector` always returns an [expectation](#).

**See Also**

Other basetypes: [checkArray](#), [checkAtomicVector](#), [checkAtomic](#), [checkCharacter](#), [checkComplex](#), [checkDataFrame](#), [checkDate](#), [checkDouble](#), [checkEnvironment](#), [checkFactor](#), [checkFormula](#), [checkFunction](#), [checkIntegerish](#), [checkInteger](#), [checkList](#), [checkLogical](#), [checkMatrix](#), [checkNull](#), [checkNumeric](#), [checkPOSIXct](#), [checkRaw](#)

Other atomicvector: [checkAtomicVector](#), [checkAtomic](#)

**Examples**

```
testVector(letters, min.len = 1L, any.missing = FALSE)
```

---

makeAssertion	<i>Turn a Check into an Assertion</i>
---------------	---------------------------------------

---

**Description**

`makeAssertion` is the internal function used to evaluate the result of a check and throw an exception if necessary. `makeAssertionFunction` can be used to automatically create an assertion function based on a check function (see example).

**Usage**

```
makeAssertion(x, res, var.name, collection)
```

```
makeAssertionFunction(check.fun, c.fun = NULL, use.namespace = TRUE,
  coerce = FALSE, env = parent.frame())
```

**Arguments**

<code>x</code>	<code>[any]</code> Object to check.
<code>res</code>	<code>[TRUE   character(1)]</code> The result of a check function: <code>TRUE</code> for successful checks, and an error message as string otherwise.
<code>var.name</code>	<code>[character(1)]</code> The custom name for <code>x</code> as passed to any <code>assert*</code> function. Defaults to a heuristic name lookup.

collection	[AssertCollection] If an <a href="#">AssertCollection</a> is provided, the error message is stored in it. If NULL, an exception is raised if res is not TRUE.
check.fun	[function] Function which checks the input. Must return TRUE on success and a string with the error message otherwise.
c.fun	[character(1)] If not NULL, instead of calling the function check.fun, use .Call to call a C function “c.fun” with the identical set of parameters. The C function must be registered as a native symbol, see <a href="#">.Call</a> . Useful if check.fun is just a simple wrapper.
use.namespace	[logical(1)] Call functions of <b>checkmate</b> using its namespace explicitly. Can be set to FALSE so save some microseconds, but the checkmate package needs to be imported. Default is TRUE.
coerce	[logical(1)] If TRUE, injects some lines of code to convert numeric values to integer after an successful assertion. Currently used in <a href="#">assertCount</a> , <a href="#">assertInt</a> and <a href="#">assertIntegerish</a> .
env	[environment] The environment of the created function. Default is the <a href="#">parent.frame</a> .

### Value

makeAssertion invisibly returns the checked object if the check was successful, and an exception is raised (or its message stored in the collection) otherwise. makeAssertionFunction returns a function.

### See Also

Other CustomConstructors: [makeExpectation](#), [makeTest](#)

### Examples

```
# Simple custom check function
checkFalse = function(x) if (!identical(x, FALSE)) "Must be FALSE" else TRUE

# Create the respective assert function
assertFalse = function(x, .var.name = vname(x), add = NULL) {
  res = checkFalse(x)
  makeAssertion(x, res, .var.name, add)
}

# Alternative: Automatically create such a function
assertFalse = makeAssertionFunction(checkFalse)
print(assertFalse)
```

---

makeExpectation	<i>Turn a Check into an Expectation</i>
-----------------	---

---

### Description

makeExpectation is the internal function used to evaluate the result of a check and turn it into an [expectation](#). makeExceptionFunction can be used to automatically create an expectation function based on a check function (see example).

### Usage

```
makeExpectation(x, res, info, label)
```

```
makeExpectationFunction(check.fun, c.fun = NULL, use.namespace = FALSE,
  env = parent.frame())
```

### Arguments

x	[any] Object to check.
res	[TRUE   character(1)] The result of a check function: TRUE for successful checks, and an error message as string otherwise.
info	[character(1)] See <a href="#">expect_that</a>
label	[character(1)] See <a href="#">expect_that</a>
check.fun	[function] Function which checks the input. Must return TRUE on success and a string with the error message otherwise.
c.fun	[character(1)] If not NULL, instead of calling the function check.fun, use .Call to call a C function “c.fun” with the identical set of parameters. The C function must be registered as a native symbol, see <a href="#">.Call</a> . Useful if check.fun is just a simple wrapper.
use.namespace	[logical(1)] Call functions of <b>checkmate</b> using its namespace explicitly. Can be set to FALSE so save some microseconds, but the checkmate package needs to be imported. Default is TRUE.
env	[environment] The environment of the created function. Default is the <a href="#">parent.frame</a> .

### Value

makeExpectation invisibly returns the checked object. makeExpectationFunction returns a function.

**See Also**

Other CustomConstructors: [makeAssertion](#), [makeTest](#)

**Examples**

```
# Simple custom check function
checkFalse = function(x) if (!identical(x, FALSE)) "Must be FALSE" else TRUE

# Create the respective expect function
expect_false = function(x, info = NULL, label = vname(x)) {
  res = checkFalse(x)
  makeExpectation(x, res, info = info, label = label)
}

# Alternative: Automatically create such a function
expect_false = makeExpectationFunction(checkFalse)
print(expect_false)
```

---

 makeTest

*Turn a Check into a Test*


---

**Description**

makeTest is the internal function used to evaluate the result of a check and throw an exception if necessary. This function is currently only a stub and just calls [isTRUE](#). makeTestFunction can be used to automatically create an assertion function based on a check function (see example).

**Usage**

```
makeTest(res)
```

```
makeTestFunction(check.fun, c.fun = NULL, env = parent.frame())
```

**Arguments**

res	[TRUE   character(1)] The result of a check function: TRUE for successful checks, and an error message as string otherwise.
check.fun	[function] Function which checks the input. Must return TRUE on success and a string with the error message otherwise.
c.fun	[character(1)] If not NULL, instead of calling the function check.fun, use .Call to call a C function “c.fun” with the identical set of parameters. The C function must be registered as a native symbol, see <a href="#">.Call</a> . Useful if check.fun is just a simple wrapper.
env	[environment] The environment of the created function. Default is the <a href="#">parent.frame</a> .



**Value**

makeTest returns TRUE if the check is successful and FALSE otherwise. makeTestFunction returns a function.

**See Also**

Other CustomConstructors: [makeAssertion](#), [makeExpectation](#)

**Examples**

```
# Simple custom check function
checkFalse = function(x) if (!identical(x, FALSE)) "Must be FALSE" else TRUE

# Create the respective test function
testFalse = function(x) {
  res = checkFalse(x)
  makeTest(res)
}

# Alternative: Automatically create such a function
testFalse = makeTestFunction(checkFalse)
print(testFalse)
```

---

 matchArg

*Partial Argument Matching*


---

**Description**

This is an extensions to [match.arg](#) with support for [AssertCollection](#). The behavior is very similar to [match.arg](#), except that NULL is not a valid value for x.

**Usage**

```
matchArg(x, choices, several.ok = FALSE, .var.name = vname(x),
  add = NULL)
```

**Arguments**

x	[character] User provided argument to match.
choices	[character()] Candidates to match x with.
several.ok	[logical(1)] If TRUE, multiple matches are allowed, cf. <a href="#">match.arg</a> .
.var.name	[character(1)] Name of the checked object to print in error messages. Defaults to the heuristic implemented in <a href="#">vname</a> .
add	[AssertCollection] Collection to store assertions. See <a href="#">AssertCollection</a> .

**Value**

Subset of choices.

**Examples**

```
matchArg("k", choices = c("kendall", "pearson"))
```

---

qassert

*Quick argument checks on (builtin) R types*


---

**Description**

The provided functions parse rules which allow to express some of the most frequent argument checks by typing just a few letters.

**Usage**

```
qassert(x, rules, .var.name = vname(x))
```

```
qtest(x, rules)
```

```
qexpect(x, rules, info = NULL, label = vname(x))
```

**Arguments**

x	[any] Object the check.
rules	[character] Set of rules. See details.
.var.name	[character(1)] Name of the checked object to print in error messages. Defaults to the heuristic implemented in <a href="#">vname</a> .
info	[character(1)] Extra information to be included in the message for the testthat reporter. See <a href="#">expect_that</a> .
label	[character(1)] Name of the checked object to print in messages. Defaults to the heuristic implemented in <a href="#">vname</a> .

**Details**

The rule is specified in up to three parts.

1. Class and missingness check. The first letter is an abbreviation for the class. If it is provided uppercase, missing values are prohibited. Supported abbreviations:

- [bB] Bool / logical.
- [iI] Integer.
- [xX] Integerish (numeric convertible to integer, see [checkIntegerish](#)).
- [rR] Real / double.
- [cC] Complex.
- [nN] Numeric (integer or double).
- [sS] String / character.
- [fF] Factor
- [aA] Atomic.
- [vV] Atomic vector (see [checkAtomicVector](#)).
- [lL] List. Missingness is defined as NULL element.
- [mM] Matrix.
- [dD] Data.frame. Missingness is checked recursively on columns.
- [pP] POSIXct date.
- [e] Environment.
- [∅] NULL.
- [\*] placeholder to allow any type.

Note that the check for missingness does not distinguish between NaN and NA. Infinite values are not treated as missing, but can be caught using boundary checks (part 3).

2. Length definition. This can be one of

- [\*] any length,
- [?] length of zero or one,
- [+] length of at least one, or
- [0-9]+ exact length specified as integer.

Preceding the exact length with one of the comparison operators `==`, `<`, `<=`, `>=` or `>` is also supported.

3. Range check as two numbers separated by a comma, enclosed by square brackets (endpoint included) or parentheses (endpoint excluded). For example, “[0, 3)” results in `all(x >= 0 & x < 3)`. The lower and upper bound may be omitted which is the equivalent of a negative or positive infinite bound, respectively. By definition `[0, ]` contains `Inf`, while `[0, )` does not. The same holds for the left (lower) boundary and `-Inf`. E.g., the rule “N1()” checks for a single finite numeric which is not NA, while “N1[]” allows `-Inf`.

## Value

`qassert` throws an R exception if object `x` does not comply to at least one of the rules and returns the tested object invisibly otherwise. `qtest` behaves the same way but returns `FALSE` if none of the rules comply. `qexpect` is intended to be inside the unit test framework [testthat](#) and returns an [expectation](#).

**Note**

The functions are inspired by the blog post of Bogumił Kamiński: <http://rsnippets.blogspot.de/2013/06/testing-function-arguments-in-gnu-r.html>. The implementation is mostly written in C to minimize the overhead.

**See Also**

[qtestr](#) and [qassertr](#) for efficient checks of list elements and data frame columns.

**Examples**

```
# logical of length 1
qttest(NA, "b1")

# logical of length 1, NA not allowed
qttest(NA, "B1")

# logical of length 0 or 1, NA not allowed
qttest(TRUE, "B?")

# numeric with length > 0
qttest(runif(10), "n+")

# integer with length > 0, NAs not allowed, all integers >= 0 and < Inf
qttest(1:3, "I+[0,)")

# either an empty list or a character vector with <=5 elements
qttest(1, c("l0", "s<=5"))

# data frame with at least one column and no missing value in any column
qttest(iris, "D+")
```

---

qassertr

*Quick recursive arguments checks on lists and data frames*

---

**Description**

These functions are the tuned counterparts of [qttest](#), [qassert](#) and [qexpect](#) tailored for recursive checks of list elements or data frame columns.

**Usage**

```
qassertr(x, rules, .var.name = vname(x))

qttestr(x, rules, depth = 1L)

qexpectr(x, rules, info = NULL, label = vname(x))
```

## Arguments

x	[list or data.frame] List or data frame to check for compliance with at least one of rules. See details of <a href="#">qtest</a> for rule explanation.
rules	[character] Set of rules. See <a href="#">qtest</a>
.var.name	[character(1)] Name of the checked object to print in error messages. Defaults to the heuristic implemented in <a href="#">vname</a> .
depth	[integer(1)] Maximum recursion depth. Defaults to “1” to directly check list elements or data frame columns. Set to a higher value to check lists of lists of elements.
info	[character(1)] Extra information to be included in the message for the testthat reporter. See <a href="#">expect_that</a> .
label	[character(1)] Name of the checked object to print in messages. Defaults to the heuristic implemented in <a href="#">vname</a> .

## Value

See [qassert](#).

## See Also

[qtest](#), [qassert](#)

## Examples

```
# All list elements are integers with length >= 1?
qtestr(as.list(1:10), "i+")

# All list elements (i.e. data frame columns) are numeric?
qtestr(iris, "n")

# All list elements are numeric, w/o NAs?
qtestr(list(a = 1:3, b = rnorm(1), c = letters), "N+")

# All list elements are numeric OR character
qtestr(list(a = 1:3, b = rnorm(1), c = letters), c("N+", "S+"))
```

---

vname	<i>Lookup a variable name</i>
-------	-------------------------------

---

### Description

Tries to heuristically determine the variable name of `x` in the parent frame with a combination of `deparse` and `substitute`. Used for checkmate's error messages.

### Usage

```
vname(x)
```

### Arguments

<code>x</code>	[ANY] Object.
----------------	------------------

### Value

character(1) Variable name.

---

wf	<i>Get the index of the first/last TRUE</i>
----	---

---

### Description

A quick C implementation for “which.first” (`head(which(x), 1)`) and “which.last” (`tail(which(x), 1)`).

### Usage

```
wf(x, use.names = TRUE)
```

```
wl(x, use.names = TRUE)
```

### Arguments

<code>x</code>	[logical] Logical vector.
<code>use.names</code>	[logical(1)] If TRUE and <code>x</code> is named, the result is also named.

### Value

integer(1) | integer(0) . Returns the index of the first/last TRUE value in `x` or an empty integer vector if none is found. NAs are ignored.

**Examples**

```
wf(c(FALSE, TRUE))
wl(c(FALSE, FALSE))
wf(NA)
```

---

%??%

*Coalesce operator*

---

**Description**

Returns the left hand side if not missing nor NULL, and the right hand side otherwise.

**Usage**

```
lhs %??% rhs
```

**Arguments**

lhs	[any]
	Left hand side of the operator. Is returned if not missing or NULL.
rhs	[any]
	Right hand side of the operator. Is returned if lhs is missing or NULL.

**Value**

Either lhs or rhs.

**Examples**

```
print(NULL %??% 1 %??% 2)
print(names(iris) %??% letters[seq_len(ncol(iris))])
```

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