Package ‘inspector’

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Type Package

Title Validation of Arguments and Objects in User-Defined Functions

Version 1.0.3

Description Utility functions that implement and automate common sets of validation tasks. These functions are particularly useful to validate inputs, intermediate objects and output values in user-defined functions, resulting in tidier and less verbose functions.

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BugReports https://github.com/ptfonseca/inspector/issues

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**inspect_bfactor**

Validate vectors of Bayes factors

**Description**

`inspect_bfactor` checks if an object is a numeric vector of valid Bayes factor values. This can be useful to validate inputs, intermediate calculations or outputs in user-defined functions.

**Usage**

```r
inspect_bfactor(x, allow_nas = TRUE, warning_nas = TRUE)
```

**Arguments**

- `x` An arbitrary object.
- `allow_nas` Logical value. If TRUE then NA and NaN values in `x` are allowed. If FALSE, execution is stopped and an error message is thrown in case there are NA or NaN values in `x`.
- `warning_nas` Logical value. If TRUE then the presence of NA or NaN values in `x` generates a warning message. NA and NaN values pass silently otherwise (if `allow_nas` is TRUE).

**Details**

`inspect_bfactor` conducts a series of tests to check if `x` is a numeric vector of valid Bayes factor values. Namely, `inspect_bfactor` checks if:

- `x` is NULL or empty.
- `x` is an atomic vector.
- `x` is numeric.
- `x` has NA or NaN values.
- The values of `x` are non-negative.
Value

inspect_bfactor does not return any output. There are three possible outcomes:

- The call is silent if:
  - `x` is a numeric vector of valid Bayes factor values and there are no `NA` or `NaN` values in `x`.
  - `x` is a numeric vector of valid Bayes factor values, there are some `NA` or `NaN` values in `x`, `allow_nas` is set to `TRUE` and `warning_nas` is set to `FALSE`.
- An informative warning message is given if `x` is a numeric vector of valid Bayes factor values, there are some `NA` or `NaN` values in `x` and both `allow_nas` and `warning_nas` are set to `TRUE`.
- An informative error message is thrown and the execution is stopped if:
  - `x` is not a numeric vector of valid Bayes factor values.
  - `x` is a numeric vector of valid Bayes factor values, there are some in `NA` or `NaN` values in `x` and `allow_nas` is set to `FALSE`.

See Also

- `inspect_bfactor_log` to check if an object is a numeric vector of valid logarithmic Bayes factor values.
- `bfactor_interpret` for the interpretation of Bayes factors.
- `inspect_bfactor_scale` to check if an object is a valid Bayes factor interpretation scale.

Examples

# Calls that pass silently:
x1 <- c(0, 0.5, 1, 10, 50, 100)
x2 <- c(NA, 0.5, 1, 10, 50, 100)
inspect_bfactor(x1)
inspect_bfactor(x2, warning_nas = FALSE)
inspect_bfactor(x2, allow_nas = TRUE, warning_nas = FALSE)

# Call that throws an informative warning message:
y <- c(0.1, 0.2, NA, 0.4, 0.5)
try(inspect_bfactor(y))
try(inspect_bfactor(y, warning_nas = TRUE))
try(inspect_bfactor(y, allow_nas = TRUE, warning_nas = TRUE))

# Calls that throw informative error messages:
z <- c(-0.9, 0, 0.1, 0.2, 0.3, 0.4, 0.5)
try(inspect_bfactor(z))
mylist <- list(
  NULL, TRUE, factor(.5), matrix(0.5),
  "0.5", list(0.5), NA, NaN, numeric(0), -0.5, -5
)
try(inspect_bfactor(mylist[[1]]))
try(inspect_bfactor(mylist[[2]]))
try(inspect_bfactor(mylist[[3]]))
try(inspect_bfactor(mylist[[4]]))
try(inspect_bfactor(mylist[[5]]))
try(inspect_bfactor(mylist[[6]]))
try(inspect_bfactor(mylist[[7]]))
try(inspect_bfactor(mylist[[8]]))
try(inspect_bfactor(mylist[[9]]))
try(inspect_bfactor(mylist[[10]]))
try(inspect_bfactor(mylist[[11]]))

inspect_bfactor_log Validate vectors of logarithmic Bayes factors

Description
inspect_bfactor_log checks if an object is a numeric vector of valid logarithmic Bayes factor values. This can be useful to validate inputs, intermediate calculations or outputs in user-defined functions.

Usage
inspect_bfactor_log(x, allow_nas = TRUE, warning_nas = TRUE)

Arguments
x An arbitrary object.
allow_nas Logical value. If TRUE then NA and NaN values in x are allowed. If FALSE, execution is stopped and an error message is thrown in case there are NA or NaN values in x.
warning_nas Logical value. If TRUE then the presence of NA or NaN values in x generates a warning message. NA and NaN values pass silently otherwise (if allow_nas is TRUE).

Details
inspect_bfactor_log conducts a series of tests to check if x is a numeric vector of valid logarithmic Bayes factor values. Namely, inspect_bfactor_log checks if:

• x is NULL or empty.
• x is an atomic vector.
• x is numeric.
• x has NA or NaN values.

Value
inspect_bfactor_log does not return any output. There are three possible outcomes:

• The call is silent if:
  – x is a numeric vector of valid logarithmic Bayes factor values and there are no NA or NaN values in x.
inspect_bfactor_log

- x is a numeric vector of valid logarithmic Bayes factor values, there are some NA or NaN values in x, allow_nas is set to TRUE and warning_nas is set to FALSE.

- An informative warning message is given if x is a numeric vector of valid logarithmic Bayes factor values, there are some NA or NaN values in x and both allow_nas and warning_nas are set to TRUE.

- An informative error message is thrown and the execution is stopped if:
  - x is not a numeric vector of valid logarithmic Bayes factor values.
  - x is a numeric vector of valid logarithmic Bayes factor values, there are some NA or NaN values in x and allow_nas is set to FALSE.

See Also

- inspect_bfactor to check if an object is a numeric vector of valid Bayes factor values.
- bfactor_log_interpret for the interpretation of the logarithms of Bayes factors.
- inspect_bfactor_scale to check if an object is a Bayes factor interpretation scale.
- inspect_log_base to check if an object is an eligible logarithmic base.

Examples

# Calls that pass silently:
x1 <- c(0, 0.5, 1, 10, 50, 100)
x2 <- c(NA, 0.5, 1, 10, 50, 100)
inspect_bfactor_log(x1)
inspect_bfactor_log(x2, warning_nas = FALSE)
inspect_bfactor_log(x2, allow_nas = TRUE, warning_nas = FALSE)

# Call that throws an informative warning message:
y <- c(0.1, 0.2, NA, 0.4, 0.5)
try(inspect_bfactor_log(y))
try(inspect_bfactor_log(y, warning_nas = TRUE))
try(inspect_bfactor_log(y, allow_nas = TRUE, warning_nas = TRUE))

# Calls that throw informative error messages:
mylist <- list(
    NULL, TRUE, factor(.5), matrix(0.5),
    "0.5", list(0.5), numeric(0), NA, NaN
)
try(inspect_bfactor_log(mylist[[1]]))
try(inspect_bfactor_log(mylist[[2]]))
try(inspect_bfactor_log(mylist[[3]]))
try(inspect_bfactor_log(mylist[[4]]))
try(inspect_bfactor_log(mylist[[5]]))
try(inspect_bfactor_log(mylist[[6]]))
try(inspect_bfactor_log(mylist[[7]]))
try(inspect_bfactor_log(mylist[[8]]))
try(inspect_bfactor_log(mylist[[9]]))
inspect_bfactor_scale  Validate Bayes factor interpretation scales

Description

inspect_bfactor_scale checks if an object is a character vector of length 1 that is eligible to represent one of the Bayes factor interpretation scales available in the pcal package. This can be useful to validate inputs in user-defined functions.

Usage

inspect_bfactor_scale(x)

Arguments

x  An arbitrary object.

Details

inspect_bfactor_scale conducts a series of tests to check if \( x \) is a character vector of length 1 that is eligible to represent one of the Bayes factor interpretation scales available in the pcal package. Namely, inspect_bfactor_scale checks if:

- \( x \) is NULL or empty.
- \( x \) is NA or NaN.
- \( x \) is an atomic vector of length 1
- The typeof \( x \) is character
- The value of \( x \) is either "Jeffreys" or "Kass-Raftery" (not case sensitive).

Value

inspect_bfactor_scale does not return any output. There are two possible scenarios:

- The call is silent if \( x \) is a character vector of length 1 that is eligible to represent one of the Bayes factor interpretation scales available in the pcal package.
- An informative error message is thrown otherwise.

See Also

- bfactor_interpret for the interpretation of Bayes factors.
- bfactor_log_interpret for the interpretation of the logarithms of Bayes factors.
- inspect_bfactor to check if an object is a numeric vector of valid Bayes factor values.
- inspect_bfactor_log to check if an object is a numeric vector of valid logarithmic Bayes factor values.
### Examples

```r
# Calls that pass silently:
x1 <- "Jeffreys"
x2 <- "jeffreys"
x3 <- "kass-raftery"
x4 <- "Kass-Raftery"
inspect_bfactor_scale(x1)
inpect_bfactor_scale(x2)
inpect_bfactor_scale(x3)
inpect_bfactor_scale(x4)

# Calls that throw informative error messages:
mylist <- list(
    NULL, NA, NaN, 10, "Bayes", "Jeff",
    "kassraftery", c("jeffreys", "kass-raftery")
)
try(inspect_bfactor_scale(mylist[[1]]))
try(inspect_bfactor_scale(mylist[[2]]))
try(inspect_bfactor_scale(mylist[[3]]))
try(inspect_bfactor_scale(mylist[[4]]))
try(inspect_bfactor_scale(mylist[[5]]))
try(inspect_bfactor_scale(mylist[[6]]))
try(inspect_bfactor_scale(mylist[[7]]))
try(inspect_bfactor_scale(mylist[[8]]))
```

### inspect_categories

<table>
<thead>
<tr>
<th>Validate factor levels</th>
</tr>
</thead>
</table>

### Description

`inspect_categories` checks if an object is eligible to be used as the levels of a factor. This can be useful to validate inputs in user-defined functions.

### Usage

```r
inspect_categories(x)
```

### Arguments

- `x`  
  An arbitrary object.

### Details

`inspect_categories` conducts a series of tests to check if `x` is eligible to be used as the levels of a factor. Namely, `inspect_categories` checks if:

- `x` is `NULL` or empty.
- `x` is atomic.
- `x` has an eligible data type (logical, integer, double, character).
• There are NA or NaN values in x.
• There are repeated values in x.

Value

inspect_categories does not return any output. There are two possible outcomes:
• The call is silent if x is eligible to be used as the levels of a factor.
• An informative error message is thrown otherwise.

See Also

• inspect_data_dichotomous to validate dichotomous data.
• inspect_data_categorical and inspect_data_cat_as_dichotom to validate categorical data.
• inspect_par_bernoulli to validate Bernoulli/Binomial proportions.
• inspect_par_multinomial to validate vectors of Multinomial proportions.
• inspect_character to validate character vectors.
• inspect_character_match to validate character vectors with predefined allowed values.

Examples

# Calls that pass silently:
x1 <- 1:5
x2 <- c("yes", "no")
x3 <- c(TRUE, FALSE)
x4 <- factor(c("smoker", "non-smoker"))
x5 <- factor(c("yes", "no", "yes"))
inspect_categories(x1)
inspect_categories(x2)
inspect_categories(x3)
inspect_categories(x4)
inspect_categories(levels(x5))

# Calls that throw informative error messages:
y1 <- c(1, 1:5)
y2 <- c("yes", "no", "yes")
y3 <- factor(c("yes", "no", "yes"))
try(inspect_categories(y1))
try(inspect_categories(y2))
try(inspect_categories(y3))
try(mylist <- list(
  NULL, numeric(0),
  complex(1), list(10), NaN, NA
))
try(inspect_categories(mylist[[1]]))
try(inspect_categories(mylist[[2]]))
try(inspect_categories(mylist[[3]]))
try(inspect_categories(mylist[[4]]))
try(inspect_categories(mylist[[5]]))
try(inspect_categories(mylist[[6]]))
**inspect_character**

---

**Validate character vectors**

**Description**

`inspect_character` checks if an object is a character vector. This can be useful to validate inputs in user-defined functions.

**Usage**

`inspect_character(x, allow_nas = TRUE, warning_nas = FALSE)`

**Arguments**

- `x` An arbitrary object.
- `allow_nas` Logical value. If TRUE then NA and NaN values in x are allowed. If FALSE, execution is stopped and an error message is thrown in case there are NA or NaN values in x.
- `warning_nas` Logical value. If TRUE then the presence of NA or NaN values in x generates a warning message. NA and NaN values pass silently otherwise (if allow_nas is set to TRUE).

**Details**

`inspect_character` conducts a series of tests to check if x is a character vector. Namely, `inspect_character` checks if:

- x is NULL or empty.
- x is an atomic vector.
- The `typeof` x is character.
- There are NA or NaN values in x.

**Value**

`inspect_character` does not return any output. There are three possible outcomes:

- The call is silent if:
  - x is a character vector and there are no NA or NaN values in x.
  - x is a character vector, there are some NA or NaN values in x, allow_nas is set to TRUE and warning_nas is set to FALSE.
- An informative warning message is thrown if x is a character vector, there are some NA or NaN values in x and both allow_nas and warning_nas are set to TRUE.
- An informative error message is thrown if:
  - x is not a character vector.
  - x is a character vector, there are some NA or NaN values in x and allow_nas is set to FALSE.
### inspect_character_match

**Validate character values**

**Description**

`inspect_character_match` checks if an object is a character vector of length 1 that belongs to a set of allowed values. This can be useful to validate inputs in user-defined functions.

**Usage**

```r
inspect_character_match(x, allowed, case_sensitive = FALSE)
```

### Examples

#### # Calls that pass silently:

```r
x1 <- "Kass"
x2 <- c("Kass", "Raftery")
x3 <- c("Kass", "Raftery", NA)
x4 <- letters
inspect_character(x1)
inspect_character(x2)
inspect_character(x3)
inspect_character(x4)
```

#### # Call that throws an informative warning message

```r
y <- c("Kass", "Raftery", NA)
try(inspect_character(y, warning_nas = TRUE))
```

#### # Calls that throw informative error messages

```r
try(inspect_character(y, allow_nas = FALSE))
mylist <- list(
  NULL, character(0), 1,
  c(1, 2), factor(c(1, 2)), list(c(1, 2)), NaN, NA
)
try(inspect_character(mylist[[1]]))
try(inspect_character(mylist[[2]]))
try(inspect_character(mylist[[3]]))
try(inspect_character(mylist[[4]]))
try(inspect_character(mylist[[5]]))
try(inspect_character(mylist[[6]]))
try(inspect_character(mylist[[7]]))
try(inspect_character(mylist[[8]]))
```
**inspect_character_match**

### Arguments

- **x**
  - An arbitrary object.
- **allowed**
  - A character vector.
- **case_sensitive**
  - A non-missing logical value.

### Details

`inspect_character_match` conducts a series of tests to check if `x` is a character vector of **length 1** whose value belongs to the set of allowed values. Namely, `inspect_character_match` checks if:

- `x` is NULL or empty.
- `x` is an atomic vector of **length 1**.
- The `typeof` of `x` is character.
- `x` is NA or NaN.
- `x` is one of the allowed values (as specified in the `allowed` argument).

By default, the comparison of `x` with `allowed` is not case sensitive. If you only want case sensitive matches of `x` to `allowed` set `case_sensitive` to `TRUE`.

### Value

`inspect_character_match` does not return any output. There are two possible outcomes:

- The call is silent if `x` is a character vector of **length 1** whose value belongs to the set of allowed values.
- An informative error message is thrown otherwise.

### See Also

- `inspect_character` to validate character vectors with arbitrary allowed values.
- `inspect_true_or_false` to check if an object is a non-missing logical value.

### Examples

```r
# Calls that pass silently:
x1 <- "Kass"
x2 <- "kass"
inspect_character_match(x1, allowed = c("Kass", "Raftery"))
inspect_character_match(x2, allowed = c("Kass", "Raftery"))

# Calls that throw informative error messages:
y1 <- "kasss"
y2 <- "kass"
try(inspect_character_match(y1, allowed = c("Kass", "Raftery")))
try(inspect_character_match(y2,
  allowed = c("Kass", "Raftery"),
  case_sensitive = TRUE
))
```
mylist <- list(
  NULL, character(0), c("abc", "abcd"),
  c("abc", "abc"), "ab", list("abc"), factor("abc"), NaN, NA
)
try(inspect_character_match(mylist[[1]], "abc"))
try(inspect_character_match(mylist[[2]], "abc"))
try(inspect_character_match(mylist[[3]], "abc"))
try(inspect_character_match(mylist[[4]], "abc"))
try(inspect_character_match(mylist[[5]], "abc"))
try(inspect_character_match(mylist[[6]], "abc"))
try(inspect_character_match(mylist[[7]], "abc"))
try(inspect_character_match(mylist[[8]], "abc"))
try(inspect_character_match(mylist[[9]], "abc"))

inspect_data_categorical

Validate categorical data

Description

inspect_data_categorical checks if an object contains data that is eligible to have been generated by a Multinomial distribution. This can be useful to validate inputs in user-defined functions.

Usage

inspect_data_categorical(data, allow_nas = TRUE, warning_nas = FALSE)

Arguments

data An arbitrary object.
allow_nas Logical value. If TRUE then NA and NaN values in data are allowed. If FALSE, execution is stopped and an error message is thrown in case there are NA or NaN values in data.
warning_nas Logical value. If TRUE then the presence of NA or NaN values in data generates a warning message. NA and NaN values pass silently otherwise (if allow_nas is set to TRUE).

Details

inspect_data_categorical conducts a series of tests to check if data is eligible to have been generated by a Multinomial distribution. Namely, inspect_data_categorical checks if:

- data is NULL or empty.
- data is atomic and have an eligible data type (logical, integer, double, character).
- data has NA or NaN values.
inspect_data_categorical does not return any output. There are three possible outcomes:

- The call is silent if:
  - data is eligible to have been generated by a Multinomial distribution and there are no NA or NaN values in data.
  - data is eligible to have been generated by a Multinomial distribution, there are some NA or NaN values in data and warning_nas is set to FALSE.
- An informative warning message is thrown if: data is eligible to have been generated by a Multinomial distribution, there are some NA or NaN values in data and warning_nas is set to TRUE.
- An informative error message is thrown and the execution is stopped if:
  - data is not eligible to have been generated by a Multinomial distribution.
  - data is eligible to have been generated by a Multinomial distribution, there are some NA or NaN values in data and allow_nas is set to TRUE.

See Also

- inspect_data_cat_as_dichotom to validate categorical data as dichotomous.
- inspect_par_multinomial to validate vectors of Multinomial proportions.
- inspect_data_dichotomous to validate dichotomous data.
- inspect_par_bernoulli to validate Bernoulli/Binomial proportions.

Examples

# Calls that pass silently:
x1 <- c(1, 0, 0, 1, 2)
x2 <- c(FALSE, FALSE, TRUE, NA)
x3 <- c("yes", "no", "yes", "maybe")
x4 <- factor(c("yes", "no", "yes", "maybe"))
x5 <- c(1, 0, 1, 0, NA, 2)
inspect_data_categorical(x1)
inspect_data_categorical(x2)
inspect_data_categorical(x3)
inspect_data_categorical(x4)
inspect_data_categorical(x5)
inspect_data_categorical(x5)

# Call that throws an informative warning message:
y1 <- c(1, 1, NA, 0, 0, 2)
try(inspect_data_categorical(y1, warning_nas = TRUE))

# Calls that throw an informative error message:
z <- c(1, 1, NA, 0, 0, 2)
try(inspect_data_categorical(z, allow_nas = FALSE))
try(inspect_data_categorical(NULL))
try(inspect_data_categorical(list(1, NULL)))
try(inspect_data_categorical(numeric(0)))
try(inspect_data_categorical(NaN))
try(inspect_data_categorical(NA))

inspect_data_cat_as_dichotom

Validate categorical data as dichotomous

Description

inspect_data_cat_as_dichotom checks if an object contains valid categorical data that is eligible to be used as dichotomous data. This can be useful to validate inputs in user-defined functions.

Usage

inspect_data_cat_as_dichotom(
  data,
  success,
  allow_nas = TRUE,
  warning_nas = FALSE
)

Arguments

data, success Arbitrary objects. success is meant to indicate the value of data that corresponds to a success.
allow_nas Logical value. If TRUE then NA and NaN values in data are allowed. If FALSE, execution is stopped and an error message is thrown in case there are NA or NaN values in data.
warning_nas Logical value. If TRUE then the presence of NA or NaN values in data generates a warning message. NA and NaN values pass silently otherwise (if allow_nas is set to TRUE).

Details

inspect_data_cat_as_dichotom conducts a series of tests to check if data contains valid categorical data that is eligible to be used as dichotomous data. Namely, inspect_data_cat_as_dichotom checks if:

- data and success are NULL or empty.
- data and success are atomic and have an eligible data type (logical, integer, double, character).
- data and success have NA or NaN values.
- success has length 1.
- success is observed in data.
**Value**

`inspect_data_cat_as_dichotom` does not return any output. There are three possible outcomes:

- The call is silent if:
  - `data` contains valid categorical data that is eligible to be used as dichotomous data and there are no `NA` or `NaN` values in `data`.
  - `data` contains valid categorical data that is eligible to be used as dichotomous data, there are some `NA` or `NaN` values in `data`, `allow_nas` is set to `TRUE` and `warning_nas` is set to `FALSE`.

- An informative warning message is thrown if:
  - `data` contains valid categorical data that is eligible to be used as dichotomous data and `success` is not observed in `data`.
  - `data` contains valid categorical data that is eligible to be used as dichotomous data, there are `NA` or `NaN` values in `data` and both `allow_nas` and `warning_nas` are set to `TRUE`.

- An informative error message is thrown and the execution is stopped if:
  - `data` does not contain valid categorical data that is eligible to be used as dichotomous data.
  - `data` contains valid categorical data that is eligible to be used as dichotomous data, there are some `NA` or `NaN` values in `data` and `allow_nas` is set to `FALSE`.

**See Also**

- `inspect_data_categorical` to validate categorical.
- `inspect_par_multinomial` to validate vectors of Multinomial proportions.
- `inspect_data_dichotomous` to validate dichotomous data.
- `inspect_par_bernoulli` to validate Bernoulli/Binomial proportions.

**Examples**

```
# Calls that pass silently:  
x1 <- c(1, 0, 0, 1, 0)  
x2 <- c(FALSE, FALSE, TRUE)  
x3 <- c("yes", "no", "yes")  
x4 <- factor(c("yes", "no", "yes"))  
x5 <- c(1, 0, 0, 1, 0, NA)  
inspect_data_cat_as_dichotom(x1, success = 1)  
inspect_data_cat_as_dichotom(x2, success = TRUE)  
inspect_data_cat_as_dichotom(x3, success = "yes")  
inspect_data_cat_as_dichotom(x4, success = "yes")  
inspect_data_cat_as_dichotom(x5, success = 1)

# Calls that throw an informative warning message:  
y1 <- c(1, 1, NA, 0, 0)  
y2 <- c(0, 0)  
success <- 1  
try(inspect_data_cat_as_dichotom(y1, success = 1, warning_nas = TRUE))  
try(inspect_data_cat_as_dichotom(y2, success = success))
```
# Calls that throw an informative error message:
try(inspect_data_cat_as_dichotom(y1, 1, allow_nas = FALSE))
try(inspect_data_cat_as_dichotom(NULL, 1))
try(inspect_data_cat_as_dichotom(c(1, 0), NULL))
try(inspect_data_cat_as_dichotom(list(1, 0), 1))
try(inspect_data_cat_as_dichotom(c(1, 0), list(1)))
try(inspect_data_cat_as_dichotom(numeric(0), 0))
try(inspect_data_cat_as_dichotom(1, numeric(0)))
try(inspect_data_cat_as_dichotom(NaN, 1))
try(inspect_data_cat_as_dichotom(NA, 1))
try(inspect_data_cat_as_dichotom(c(1, 0), NA))
try(inspect_data_cat_as_dichotom(c(1, 0), NaN))
try(inspect_data_cat_as_dichotom(c(1, 0), 2))

inspect_data_dichotomous
Validate dichotomous data

Description
inspect_data_dichotomous checks if an object contains data that is eligible to have been generated by a series of Bernoulli trials. This can be useful to validate inputs in user-defined functions.

Usage
inspect_data_dichotomous(data, success, allow_nas = TRUE, warning_nas = FALSE)

Arguments
data, success Arbitrary objects. success is meant to indicate the value of data that corresponds to a success.
allow_nas Logical value. If TRUE then NA and NaN values in data are allowed. If FALSE, execution is stopped and an error message is thrown in case there are NA or NaN values in data.
warning_nas Logical value. If TRUE then the presence of NA or NaN values in data generates a warning message. NA and NaN values pass silently otherwise (if allow_nas is set to TRUE).

Details
inspect_data_dichotomous conducts a series of tests to check if data is eligible to have been generated by a series of Bernoulli trials. Namely, inspect_data_dichotomous checks if:

- data and success are NULL or empty.
- data and success are atomic and have an eligible data type (logical, integer, double, character).
- data and success have NA or NaN values.
The number of unique values in `data` and `success` are adequate.

- `success` has `length 1`.
- `success` is observed in `data`.

### Value

`inspect_data_dichotomous` does not return any output. There are three possible outcomes:

- The call is silent if:
  - `data` is eligible to have been generated by a series of Bernoulli trials and there are no NA or NaN values in `data`.
  - `data` is eligible to have been generated by a series of Bernoulli trials, there are some NA or NaN values in `data`, `allow_nas` is set to `TRUE` and `warning_nas` is set to `FALSE`.

- An informative warning message is thrown if:
  - `data` is eligible to have been generated by a series of Bernoulli trials and `success` is not observed in `data`.
  - `data` is eligible to have been generated by a series of Bernoulli trials, there are NA or NaN values in `data` and both `allow_nas` and `warning_nas` are set to `TRUE`.

- An informative error message is thrown and the execution is stopped if:
  - `data` is not eligible to have been generated by a series of Bernoulli trials.
  - `data` is eligible to have been generated by a series of Bernoulli trials, there are some NA or NaN values in `data` and `allow_nas` is set to `FALSE`.

### See Also

- `inspect_par_bernoulli` to validate Bernoulli/Binomial proportions.
- `inspect_data_categorical` and `inspect_data_cat_as_dichotom` to validate categorical data.
- `inspect_par_multinomial` to validate vectors of Multinomial proportions.

### Examples

```r
# Calls that pass silently:
x1 <- c(1, 0, 0, 1, 0)
x2 <- c(FALSE, FALSE, TRUE)
x3 <- c("yes", "no", "yes")
x4 <- factor(c("yes", "no", "yes"))
x5 <- c(1, 0, 0, 1, 0, NA)
inspect_data_dichotomous(x1, success = 1)
inspect_data_dichotomous(x2, success = TRUE)
inspect_data_dichotomous(x3, success = "yes")
inspect_data_dichotomous(x4, success = "yes")
inspect_data_dichotomous(x5, success = 1)

# Calls that throw an informative warning message:
y1 <- c(1, 1, NA, 0, 0)
y2 <- c(0, 0)
success <- 1
```

- `inspect_data_dichotomous`
try(inspect_data_dichotomous(y1, success = 1, warning_nas = TRUE))
try(inspect_data_dichotomous(y2, success = success))

# Calls that throw an informative error message:
try(inspect_data_dichotomous(NULL, 1))
try(inspect_data_dichotomous(c(1, 0), NULL))
try(inspect_data_dichotomous(list(1, 0), 1))
try(inspect_data_dichotomous(c(1, 0), list(1)))
try(inspect_data_dichotomous(numeric(0), 0))
try(inspect_data_dichotomous(1, numeric(0)))
try(inspect_data_dichotomous(c(1, 0), NA))
try(inspect_data_dichotomous(c(1, 0), NaN))
try(inspect_data_dichotomous(c(1, 0), 2))

---

### inspect_log_base

Validate logarithmic bases

**Description**

`inspect_log_base` checks if an object is a valid a logarithmic base. This can be useful to validate inputs in user-defined functions.

**Usage**

`inspect_log_base(x)`

**Arguments**

- `x`: An arbitrary object.

**Details**

`inspect_log_base` conducts a series of tests to check if `x` is a valid logarithmic base. Namely, `inspect_log_base` checks if:

- `x` is NULL or empty.
- `x` is an atomic vector of length 1.
- `x` is numeric.
- `x` is NA or NaN.
- `x` is positive.

**Value**

`inspect_log_base` does not return any output. There are two possible outcomes:

- The call is silent if `x` is a numeric vector of length 1 that is a valid logarithmic base.
- An informative error message is thrown otherwise.
**inspect_par_bernoulli**

Validate parameters for the Bernoulli/Binomial distributions

**Description**

`inspect_par_bernoulli` checks if an object is an eligible Bernoulli/Binomial proportion. This can be useful to validate inputs, intermediate calculations or outputs in user-defined functions.

**Usage**

```r
inspect_par_bernoulli(x)
```

**Arguments**

- `x`  
  An arbitrary object.

**See Also**

- `bfactor_log_interpret` for the interpretation of the logarithms of Bayes factors.
- `inspect_bfactor_log` to check if an object is a numeric vector of valid logarithmic Bayes factor values.

**Examples**

```r
# Calls that pass silently:
x1 <- 10
x2 <- exp(1)
x3 <- 0.5
inspect_log_base(x1)
inspect_log_base(x2)
inspect_log_base(x3)

# Calls that throw informative error messages:
mylist <- list(
  NULL, numeric(0), TRUE, factor(10),
  list(10), matrix(10), NaN, NA, -1, 0
)
try(inspect_log_base(mylist[[1]]))
try(inspect_log_base(mylist[[2]]))
try(inspect_log_base(mylist[[3]]))
try(inspect_log_base(mylist[[4]]))
try(inspect_log_base(mylist[[5]]))
try(inspect_log_base(mylist[[6]]))
try(inspect_log_base(mylist[[7]]))
try(inspect_log_base(mylist[[8]]))
try(inspect_log_base(mylist[[9]]))
try(inspect_log_base(mylist[[10]]))
```
Details

`inspect_par_bernoulli` conducts a series of tests to check if `x` is an eligible Bernoulli/Binomial proportion. Namely, `inspect_par_bernoulli` checks if:

- `x` is NULL or empty.
- `x` is an atomic vector
- `x` is numeric
- `x` has `length` 1
- `x` is NA or NaN.
- `x` is in the (0, 1) interval.

Value

`inspect_par_bernoulli` does not return any output. There are two possible outcomes:

- The call is silent if `x` is an eligible Bernoulli/Binomial proportion.
- An informative error message is thrown otherwise.

See Also

- `inspect_par_multinomial` to validate parameters for the Multinomial distribution.
- `inspect_par_beta` to validate parameters for the Beta distribution.
- `inspect_par_dirichlet` to validate parameters for the Dirichlet distribution.
- `inspect_par_haldane` to validate parameters for the Haldane distribution.
- `inspect_data_dichotomous` to validate dichotomous data.
- `inspect_prob` to check if an object is a numeric vector of valid probability values.

Examples

```r
# Calls that pass silently:
x <- 0.5
inspect_par_bernoulli(x)
inspect_par_bernoulli(0.1)

# Calls that throw an informative error message:
mylist <- list(
    NULL, TRUE, factor(.5), matrix(0.5), "0.5",
    list(0.5), NA, NaN, numeric(0), c(0.1, 0.5), -0.5, 1.1
)
try(inspect_par_bernoulli(mylist[[1]]))
try(inspect_par_bernoulli(mylist[[2]]))
try(inspect_par_bernoulli(mylist[[3]]))
try(inspect_par_bernoulli(mylist[[4]]))
try(inspect_par_bernoulli(mylist[[5]]))
try(inspect_par_bernoulli(mylist[[6]]))
try(inspect_par_bernoulli(mylist[[7]]))
try(inspect_par_bernoulli(mylist[[8]]))
```
inspect_par_beta

try(inspect_par_beroulli(mylist[[9]]))
try(inspect_par_beroulli(mylist[[10]]))
try(inspect_par_beroulli(mylist[[11]]))
try(inspect_par_beroulli(mylist[[12]]))

---

**Description**

`inspect_par_beta` checks if an object is an eligible vector of parameters for the Beta distribution. This can be useful to validate inputs, intermediate calculations or outputs in user-defined functions.

**Usage**

```
inspect_par_beta(x)
```

**Arguments**

- **x**: An arbitrary object.

**Details**

`inspect_par_beta` conducts a series of tests to check if `x` is an eligible vector of parameters for the Beta distribution. Namely, `inspect_par_beta` checks if:

- `x` is NULL or empty.
- `x` is an atomic vector
- `x` is numeric
- `x` has length 2
- `x` has NA or NaN values.
- All elements of `x` are positive.

**Value**

`inspect_par_beta` does not return any output. There are two possible outcomes:

- The call is silent if `x` is an eligible vector of parameters for the Beta distribution.
- An informative error message is thrown otherwise.

**See Also**

- `inspect_par_beroulli` to validate parameters for the Bernoulli/Binomial distribution.
- `inspect_par_multinomial` to validate parameters for the Multinomial distribution.
- `inspect_par_dirichlet` to validate parameters for the Dirichlet distribution.
- `inspect_par_haldane` to validate parameters for the Haldane distribution.


**Examples**

```r
# Calls that pass silently:
x1 <- c(1, 1)
x2 <- c(2, 5)
inspect_par_beta(x1)
inspect_par_beta(x2)

# Calls that throw an informative error message:
mylist <- list(
  NULL, 1, factor(1, 1),
  matrix(c(1, 1)), c("1", "1"), list(1, 1), c(1, NA),
  c(1, NaN), c(TRUE, FALSE), numeric(0), c(-1, 1)
)
try(inspect_par_beta(mylist[[1]]))
try(inspect_par_beta(mylist[[2]]))
try(inspect_par_beta(mylist[[3]]))
try(inspect_par_beta(mylist[[4]]))
try(inspect_par_beta(mylist[[5]]))
try(inspect_par_beta(mylist[[6]]))
try(inspect_par_beta(mylist[[7]]))
try(inspect_par_beta(mylist[[8]]))
try(inspect_par_beta(mylist[[9]]))
try(inspect_par_beta(mylist[[10]]))
try(inspect_par_beta(mylist[[11]]))
```

---

**inspect_par_dirichlet**  
Validate parameters for the Dirichlet distribution

**Description**

*inspect_par_dirichlet* checks if an object is an eligible vector of parameters for the Dirichlet distribution. This can be useful to validate inputs, intermediate calculations or outputs in user-defined functions.

**Usage**

```r
inspect_par_dirichlet(x)
```

**Arguments**

- `x`  
  An arbitrary object.

**Details**

*inspect_par_dirichlet* conducts a series of tests to check if `x` is an eligible vector of parameters for the Dirichlet distribution. Namely, *inspect_par_dirichlet* checks if:

- `x` is NULL or empty.
- `x` is an atomic vector
• x is numeric
• x has NA or NaN values.
• All elements of x are positive.

Value

inspect_par_dirichlet does not return any output. There are two possible outcomes:

• The call is silent if x is an eligible vector of parameters for the Dirichlet distribution.
• An informative error message is thrown otherwise.

See Also

• inspect_par_bernoulli to validate parameters for the Bernoulli/Binomial distribution.
• inspect_par_multinomial to validate parameters for the Multinomial distribution.
• inspect_par_beta to validate parameters for the Beta distribution.
• inspect_par_haldane to validate parameters for the Haldane distribution.

Examples

# Calls that pass silently:
x1 <- c(1, 1, 1)
x2 <- c(2, 5)
inspect_par_dirichlet(x1)
inspect_par_dirichlet(x2)

# Calls that throw an informative error message:
mylist <- list(
    NULL, factor(1, 1, 1),
    matrix(c(1, 1, 1)), c("1", "1", "1"), list(1, 1, 1), c(1, NA),
    c(1, NaN, 1), c(TRUE, FALSE), numeric(0), c(-1, 1, 1)
)
try(inspect_par_dirichlet(mylist[[1]]))
try(inspect_par_dirichlet(mylist[[2]]))
try(inspect_par_dirichlet(mylist[[3]]))
try(inspect_par_dirichlet(mylist[[4]]))
try(inspect_par_dirichlet(mylist[[5]]))
try(inspect_par_dirichlet(mylist[[6]]))
try(inspect_par_dirichlet(mylist[[7]]))
try(inspect_par_dirichlet(mylist[[8]]))
try(inspect_par_dirichlet(mylist[[9]]))
try(inspect_par_dirichlet(mylist[[10]]))
inspect_par_haldane  Validate parameters for the Haldane distribution

Description

inspect_par_haldane checks if an object is an eligible vector of parameters for the Haldane distribution. This can be useful to validate inputs, intermediate calculations or outputs in user-defined functions.

Usage

inspect_par_haldane(x)

Arguments

x  An arbitrary object.

Details

inspect_par_haldane conducts a series of tests to check if x is an eligible vector of parameters for the Haldane distribution. Namely, inspect_par_haldane checks if:

- x is NULL or empty.
- x is an atomic vector
- x is numeric
- x has NA or NaN values.
- All elements of x equal to 0.

Value

inspect_par_haldane does not return any output. There are two possible outcomes:

- The call is silent if x is an eligible vector of parameters for the Haldane distribution.
- An informative error message is thrown otherwise.

See Also

- inspect_par_bernoulli to validate parameters for the Bernoulli/Binomial distribution.
- inspect_par_multinomial to validate parameters for the Multinomial distribution.
- inspect_par_beta to validate parameters for the Beta distribution.
- inspect_par_dirichlet to validate parameters for the Dirichlet distribution.
Examples

# Calls that pass silently:
x1 <- c(0, 0, 0)
x2 <- c(0, 0)
inspect_par_haldane(x1)
inspect_par_haldane(x2)

# Calls that throw an informative error message:
mylist <- list(
  NULL, factor(0, 0, 0),
  matrix(c(0, 0, 0)), c("0", "0", "0"), list(0, 0, 0), c(0, NA),
  c(0, NaN, 0), c(TRUE, FALSE), numeric(0), c(1, 0, 0)
)
try(inspect_par_haldane(mylist[[1]]))
try(inspect_par_haldane(mylist[[2]]))
try(inspect_par_haldane(mylist[[3]]))
try(inspect_par_haldane(mylist[[4]]))
try(inspect_par_haldane(mylist[[5]]))
try(inspect_par_haldane(mylist[[6]]))
try(inspect_par_haldane(mylist[[7]]))
try(inspect_par_haldane(mylist[[8]]))
try(inspect_par_haldane(mylist[[9]]))
try(inspect_par_haldane(mylist[[10]]))

---

inspect_par_multinomial

Validate parameters for the Multinomial distribution

Description

inspect_par_multinomial checks if an object is an eligible vector of Multinomial proportions. This can be useful to validate inputs, intermediate calculations or outputs in user-defined functions.

Usage

inspect_par_multinomial(x)

Arguments

x An arbitrary object.

Details

inspect_par_multinomial conducts a series of tests to check if x is an eligible vector of Multinomial proportions. Namely, inspect_par_multinomial checks if:

- x is NULL or empty.
- x is an atomic vector
inspect_par_multinomial

- x is numeric
- x has NA or NaN values.
- All elements of x are in the (0, 1) interval.
- x sums to 1.

Value

inspect_par_multinomial does not return any output. There are two possible outcomes:

- The call is silent if x is an eligible vector of Multinomial proportions.
- An informative error message is thrown otherwise.

See Also

- inspect_par_bernoulli to validate parameters for the Bernoulli/Binomial distribution.
- inspect_par_beta to validate parameters for the Beta distribution.
- inspect_par_dirichlet to validate parameters for the Dirichlet distribution.
- inspect_par_haldane to validate parameters for the Haldane distribution.
- inspect_data_categorical and inspect_data_cat_as_dichotom to validate categorical data.
- inspect_prob to check if an object is a numeric vector of valid probability values.

Examples

# Calls that pass silently:
x1 <- c(0.5, 0.5)
x2 <- rep(1 / 5, 5)
inspect_par_multinomial(x1)
inspect_par_multinomial(x2)

# Calls that throw an informative error message:
mylist <- list(
  NULL, TRUE, factor(0.5, 0.5),
  matrix(c(0.5, 0.5)), c("0.5", "0.5"), list(0.5, 0.5),
  c(0.9, NA), c(0.9, NaN), numeric(0), NA, c(0.9, 0.6), c(-0.1, 0.9)
)
try(inspect_par_multinomial(mylist[[1]]))
try(inspect_par_multinomial(mylist[[2]]))
try(inspect_par_multinomial(mylist[[3]]))
try(inspect_par_multinomial(mylist[[4]]))
try(inspect_par_multinomial(mylist[[5]]))
try(inspect_par_multinomial(mylist[[6]]))
try(inspect_par_multinomial(mylist[[7]]))
try(inspect_par_multinomial(mylist[[8]]))
try(inspect_par_multinomial(mylist[[9]]))
try(inspect_par_multinomial(mylist[[10]]))
try(inspect_par_multinomial(mylist[[11]]))
try(inspect_par_multinomial(mylist[[12]]))
inspect_prob

**Validate vectors of probabilities**

**Description**

`inspect_prob` checks if an object is a numeric vector of valid probability values. This can be useful to validate inputs, intermediate calculations or outputs in user-defined functions.

**Usage**

`inspect_prob(x, allow_nas = TRUE, warning_nas = TRUE)`

**Arguments**

- **x**: An arbitrary object.
- **allow_nas**: Logical value. If `TRUE` then `NA` and `NaN` values in `x` are allowed. If `FALSE`, execution is stopped and an error message is thrown in case there are `NA` or `NaN` values in `x`.
- **warning_nas**: Logical value. If `TRUE` then the presence of `NA` or `NaN` values in `x` generates a warning message. `NA` and `NaN` values pass silently otherwise (if `allow_nas` is set to `TRUE`).

**Details**

`inspect_prob` conducts a series of tests to check if `x` is a numeric vector of valid probability values. Namely, `inspect_prob` checks if:

- `x` is `NULL` or empty.
- `x` is an atomic vector.
- `x` is numeric.
- `x` has `NA` or `NaN` values.
- The values of `x` are in the `[0, 1]` interval.

**Value**

`inspect_prob` does not return any output. There are three possible outcomes:

- The call is silent if:
  - `x` is a numeric vector of valid probability values and there are no `NA` or `NaN` values in `x`.
  - `x` is a numeric vector of valid probability values, there are some `NA` or `NaN` values in `x`, `allow_nas` is set to `TRUE` and `warning_nas` is set to `FALSE`.
- An informative warning message is thrown if `x` is a numeric vector of valid probability values, there are some `NA` or `NaN` values in `x` and both `allow_nas` and `warning_nas` are set to `TRUE`.
- An informative error message is thrown and the execution is stopped if:
  - `x` is not a numeric vector of valid probability values.
  - `x` is a numeric vector of valid probability values, there are some `NA` or `NaN` values in `x` and `allow_nas` is set to `FALSE`. 
See Also

- `inspect_par_bernoulli` to check if an object is a valid Bernoulli/Binomial proportion.
- `inspect_par_multinomial` to check if an object is a numeric vector of valid Multinomial proportions.

Examples

```r
# Calls that pass silently:
x1 <- c(0.1, 0.2, 0.3, 0.4, 0.5)
x2 <- c(0.1, 0.2, 0.3, 0.4, 0.5, NA)
inspect_prob(x1)
inspect_prob(x2, warning_nas = FALSE)
inspect_prob(x2, allow_nas = TRUE, warning_nas = FALSE)

# Calls that throw an informative warning message:
y <- c(0.1, 0.2, NA, 0.4, 0.5)
try(inspect_prob(y))
try(inspect_prob(y, allow_nas = TRUE))
try(inspect_prob(y, allow_nas = TRUE, warning_nas = TRUE))

# Calls that throw an informative error message:
z1 <- c(-0.9, 0, 0.1, 0.2, 0.3, 0.4, 0.5)
try(inspect_prob(z1))
z2 <- c(NA, 0, 0.1, 0.2, 0.3, 0.4, 0.5)
try(inspect_prob(z2, allow_nas = FALSE))
mylist <- list(
    NULL, TRUE, factor(.5), matrix(0.5),
    "0.5", list(0.5), NA, NaN, numeric(0), 1.1, -0.5
)
try(inspect_prob(mylist[[1]]))
try(inspect_prob(mylist[[2]]))
try(inspect_prob(mylist[[3]]))
try(inspect_prob(mylist[[4]]))
try(inspect_prob(mylist[[5]]))
try(inspect_prob(mylist[[6]]))
try(inspect_prob(mylist[[7]]))
try(inspect_prob(mylist[[8]]))
try(inspect_prob(mylist[[9]]))
try(inspect_prob(mylist[[10]]))
try(inspect_prob(mylist[[11]])))
```
Usage

inspect_true_or_false(x)

Arguments

x An arbitrary object.

Details

inspect_true_or_false conducts a series of tests to check if x is a non-missing logical vector of length 1. Namely, inspect_true_or_false checks if:

- x is NULL or empty.
- x is an atomic vector of length 1.
- The typeof x is logical.
- x is NA or NaN.

Value

inspect_true_or_false does not return any output. There are two possible scenarios:

- The call is silent if x is a non-missing logical vector of length 1.
- An informative error message is thrown otherwise.

See Also

- inspect_character to validate character vectors.
- inspect_character_match to validate character vectors with predefined allowed values.

Examples

# Calls that pass silently:
x <- TRUE
y <- FALSE
inspect_true_or_false(x)
inspect_true_or_false(y)

# Calls that throw informative error messages:
mylist <- list(NULL, NA, NaN, 1, 0, "TRUE")
try(inspect_true_or_false(mylist[[1]]))
try(inspect_true_or_false(mylist[[2]]))
try(inspect_true_or_false(mylist[[3]]))
try(inspect_true_or_false(mylist[[4]]))
try(inspect_true_or_false(mylist[[5]]))
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