

Package ‘RCLabels’

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Description Functions to assist manipulation of matrix row and column labels for all types of matrix mathematics where row and column labels are to be respected.

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Author Matthew Heun [aut, cre] (<<https://orcid.org/0000-0002-7438-214X>>)

Maintainer Matthew Heun <matthew.heun@me.com>

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arrow_notation	<i>Arrow notation</i>
----------------	-----------------------

Description

A description of arrow notation.

Usage

arrow_notation

Format

A vector of notational symbols that provides an arrow separator ("a -> b") between prefix and suffix.

Examples

arrow_notation

bracket_arrow_notation

Bracket arrow notation

Description

A description of bracket arrow notation.

Usage

bracket_arrow_notation

Format

A vector of notational symbols that provides bracket arrow ("a [-> b]") notation.

Examples

bracket_arrow_notation

bracket_notation

Bracket notation

Description

A description of bracket notation.

Usage

bracket_notation

Format

A vector of notational symbols that provides bracket ("a [b]") notation.

Examples

bracket_notation

dash_notation	<i>A description of dash notation.</i>
---------------	--

Description

A description of dash notation.

Usage

dash_notation

Format

A vector of notational symbols that provides an dash separator ("a - b") between prefix and suffix.

Examples

dash_notation

first_dot_notation	<i>First dot notation</i>
--------------------	---------------------------

Description

A description of first dot notation. Note that "a.b.c" splits into prefix ("a") and suffix ("b.c").

Usage

first_dot_notation

Format

A vector of notational symbols that provides first dot ("a.b") notation.

Examples

first_dot_notation

from_notation	<i>From notation</i>
---------------	----------------------

Description

A description of from notation.

Usage

```
from_notation
```

Format

A vector of notational symbols that provides from ("a [from b]") notation.

Examples

```
from_notation
```

get_nouns	<i>Extract nouns from row and column labels</i>
-----------	---

Description

Nouns are the first part of a row-column label, "a" in "a [b]". Internally, this function calls `get_pref_suff` (which = "pref").

Usage

```
get_nouns(
  labels,
  inf_notation = TRUE,
  notation = RCLabels::notations_list,
  choose_most_specific = TRUE
)
```

Arguments

labels	A list or vector of labels from which nouns are to be extracted.
inf_notation	A boolean that tells whether to infer notation for x. Default is TRUE. See <code>infer_notation()</code> for details.
notation	The notation type to be used when extracting nouns. Default is <code>RCLabels::notations_list</code> , meaning that the notation is inferred using <code>infer_notation()</code> .
choose_most_specific	A boolean that tells whether to choose the most specific notation from notation when inferring notation. Default is TRUE.

Value

A list of nouns from row and column labels.

Examples

```
get_nouns("a [b]", notation = bracket_notation)
# Also works with vectors and lists.
get_nouns(c("a [b]", "c [d]"))
get_nouns(list("a [b]", "c [d]"))
```

get_objects

Extract objects of prepositional phrases in row and column labels

Description

This function extracts the objects of prepositional phrases from row and column labels. The format of the output is a list of named items, one name for each preposition encountered in labels. Objects are NA if there is no prepositional phrase starting with that preposition.

Usage

```
get_objects(
  labels,
  inf_notation = TRUE,
  notation = RCLabels::notations_list,
  choose_most_specific = FALSE,
  prepositions = RCLabels::prepositions_list
)
```

Arguments

- | | |
|----------------------|---|
| labels | The row and column labels from which prepositional phrases are to be extracted. |
| inf_notation | A boolean that tells whether to infer notation for x. Default is TRUE. See infer_notation() for details. |
| notation | The notation type to be used when extracting prepositions. Default is RCLabels::notations_list, meaning that the notation is inferred using infer_notation(). |
| choose_most_specific | A boolean that tells whether to choose the most specific notation from notation when inferring notation. Default is FALSE so that a less specific notation can be inferred. In combination with RCLabels::notations_list, the default value of FALSE means that RCLabels::bracket_notation will be selected instead of anything more specific, such as RCLabels::from_notation. |
| prepositions | A vector of strings to be treated as prepositions. Note that a space is appended to each word internally, so, e.g., "to" becomes "to ". Default is RCLabels::prepositions_list. |

Value

A list of objects of prepositional phrases, with names being prepositions, and values being objects.

Examples

```
get_objects(c("a [of b into c]", "d [of Coal from e -> f]"))
```

get_piece	<i>Get a piece of a label</i>
-----------	-------------------------------

Description

This is a wrapper function for `get_pref_suff()`, `get_nouns()`, and `get_objects()`. It returns a piece of a row or column label.

Usage

```
get_piece(
  labels,
  piece = "all",
  inf_notation = TRUE,
  notation = RCLabels::notations_list,
  choose_most_specific = FALSE,
  prepositions = RCLabels::prepositions_list
)
```

Arguments

labels	The row and column labels from which prepositional phrases are to be extracted.
piece	The name of the item to return.
inf_notation	A boolean that tells whether to infer notation for x. Default is TRUE. See <code>infer_notation()</code> for details.
notation	The notation type to be used when extracting prepositions. Default is <code>RCLabels::notations_list</code> , meaning that the notation is inferred using <code>infer_notation()</code> .
choose_most_specific	A boolean that tells whether to choose the most specific notation from <code>notation</code> when inferring notation. Default is FALSE so that a less specific notation can be inferred. In combination with <code>RCLabels::notations_list</code> , the default value of FALSE means that <code>RCLabels::bracket_notation</code> will be selected instead of anything more specific, such as <code>RCLabels::from_notation</code> .
prepositions	A vector of strings to be treated as prepositions. Note that a space is appended to each word internally, so, e.g., "to" becomes "to ". Default is <code>RCLabels::prepositions_list</code> .

Details

piece is typically one of

- "all" (which returns labels directly),
- "pref" (for the prefixes),
- "suff" (for the suffixes),
- "noun" (returns the noun),
- "pps" (prepositional phrases, returns prepositional phrases in full),
- "prepositions" (returns a list of prepositions),
- "objects" (returns a list of objects with prepositions as names), or
- a preposition in prepositions (as a string), which will return the object of that preposition named by the preposition itself.

piece must be a character vector of length 1.

If a piece is missing in a label, "" (empty string) is returned.

Value

A piece of labels.

Examples

```
labs <- c("a [from b in c]", "d [of e in f]", "Export [of Coal from USA to MEX]")
get_piece(labs, "pref")
get_piece(labs, "suff")
get_piece(labs, piece = "noun")
get_piece(labs, piece = "pps")
get_piece(labs, piece = "prepositions")
get_piece(labs, piece = "objects")
get_piece(labs, piece = "from")
get_piece(labs, piece = "in")
get_piece(labs, piece = "of")
get_piece(labs, piece = "to")
```

get_pps

Extract prepositional phrases of row and column labels

Description

This function extracts prepositional phrases from suffixes of row and column labels of the form "a [preposition b]", where "preposition b" is the prepositional phrase.

Usage

```

get_pps(
  labels,
  inf_notation = TRUE,
  notation = RCLabels::notations_list,
  choose_most_specific = FALSE,
  prepositions = RCLabels::prepositions_list
)

```

Arguments

- labels** A list or vector of labels from which prepositional phrases are to be extracted.
- inf_notation** A boolean that tells whether to infer notation for x. Default is TRUE. See `infer_notation()` for details.
- notation** The notation type to be used when extracting prepositional phrases. Default is `RCLabels::notations_list`, meaning that the notation is inferred using `infer_notation()`.
- choose_most_specific** A boolean that tells whether to choose the most specific notation from `notation` when inferring notation. Default is FALSE so that a less specific notation can be inferred. In combination with `RCLabels::notations_list`, the default value of FALSE means that `RCLabels::bracket_notation` will be selected instead of anything more specific, such as `RCLabels::from_notation`.
- prepositions** A list of prepositions for which to search. Default is `RCLabels::prepositions_list`.

Value

All prepositional phrases in a suffix.

Examples

```

get_pps(c("a [in b]", "c [of d]"))
get_pps(c("a [of b in c]", "d [-> e of f]"))

```

get_prepositions *Extract prepositions from row and column labels*

Description

This function extracts prepositions from a list of row and column labels. The list has outer structure of the number of labels and an inner structure of each prepositional phrase in the specific label.

Usage

```

get_prepositions(
  labels,
  inf_notation = TRUE,
  notation = RCLabels::notations_list,
  choose_most_specific = FALSE,
  prepositions = RCLabels::prepositions_list
)

```

Arguments

labels	The row and column labels from which prepositional phrases are to be extracted.
inf_notation	A boolean that tells whether to infer notation for x. Default is TRUE. See infer_notation() for details.
notation	The notation type to be used when extracting prepositions. Default is RCLabels::notations_list, meaning that the notation is inferred using infer_notation().
choose_most_specific	A boolean that tells whether to choose the most specific notation from notation when inferring notation. Default is FALSE so that a less specific notation can be inferred. In combination with RCLabels::notations_list, the default value of FALSE means that RCLabels::bracket_notation will be selected instead of anything more specific, such as RCLabels::from_notation.
prepositions	A vector of strings to be treated as prepositions. Note that a space is appended to each word internally, so, e.g., "to" becomes "to ". Default is RCLabels::prepositions_list.

Value

A list of prepositions.

Examples

```
get_prepositions(c("a [of b into c]", "d [-> e of f]"))
```

infer_notation	<i>Infer the notation(s) for a row or column label</i>
----------------	--

Description

It is convenient to know which notation is applicable to row or column labels. This function infers which notations are appropriate for x.

Usage

```
infer_notation(
  x,
  inf_notation = TRUE,
  notations = RCLabels::notations_list,
  allow_multiple = FALSE,
  retain_names = FALSE,
  choose_most_specific = TRUE,
  must_succeed = TRUE
)
```

Arguments

<code>x</code>	A row or column label (or vector of labels).
<code>inf_notation</code>	A boolean that tells whether to infer notation for <code>x</code> . Default is <code>TRUE</code> .
<code>notations</code>	A list of notations from which matches will be inferred. Default is <code>RCLabels::notations_list</code> .
<code>allow_multiple</code>	A boolean that tells whether multiple notation matches are allowed. If <code>FALSE</code> (the default), multiple matches give an error.
<code>retain_names</code>	A boolean that tells whether to retain names from notations on the outgoing matches. Default is <code>FALSE</code> . If <code>TRUE</code> , the return value is <i>always</i> a named list. If only one of notations is returned (for example, because <code>choose_most_specific = TRUE</code>), names are never supplied.
<code>choose_most_specific</code>	A boolean that indicates whether the most-specific notation will be returned when more than one of notations matches <code>x</code> and <code>allow_multiple = FALSE</code> . When <code>FALSE</code> , the first matching notation in <code>notations</code> is returned when <code>allow_multiple = FALSE</code> . Default is <code>TRUE</code> . See details.
<code>must_succeed</code>	A boolean that if <code>TRUE</code> (the default), causes an error to be thrown if a matching notation is not found for any label in <code>x</code> . When <code>FALSE</code> , an unsuccessful notation inference will return <code>NULL</code> .

Details

This function is vectorized. Thus, `x` can be a vector, in which case the output is a list of notations.

`notations` is treated as a store from which matches for each label in `x` can be determined. `notations` should be a named list of notations. When `retain_names = TRUE`, the names on notations will be retained, and the return value is *always* a list.

By default (`allow_multiple = FALSE`), a single notation object is returned for each item in `x` if only one notation in `notations` is appropriate for `x`. If `allow_multiple = FALSE` (the default) and more than one notation is applicable to `x`, an error is thrown. Multiple matches can be returned when `allow_multiple = TRUE`.

If multiple notations are matched, the return value is a list.

When `choose_most_specific = TRUE` (the default), the most specific notation in `notations` is returned. "Most specific" is defined as the matching notation whose sum of characters in the `pref_start`, `pref_end`, `suff_start` and `suff_end` elements is greatest. If `choose_most_specific`

= TRUE and two matching notations in notations have the same number of characters, only the first match is returned. When choose_most_specific = TRUE, the value of allow_multiple no longer matters. allow_multiple = FALSE is implied and at most one of the notations will be returned.

When inf_notation = FALSE (default is TRUE), notations are returned unmodified, essentially disabling this function. Although calling with inf_notation = FALSE seems daft, this behavior enables cleaner code elsewhere.

Value

A single notation object (if x is a single row or column label) or a list of notation objects (if x is a vector or a list). If no notations match x, NULL is returned, either alone or in a list.

Examples

```
# Does not match any notations in RCLabels::notations_list
# and throws an error, because the default value for `must_succeed`
# is `TRUE`.
## Not run:
infer_notation("abc")

## End(Not run)
# This returns `NULL`, because `must_succeed = FALSE`.
infer_notation("abc", must_succeed = FALSE)
# This succeeds, because the label is in the form of a
# notation in `RCLabels::notation_list`,
# the default value of the `notation` argument.
infer_notation("a -> b")
# Names of the notations can be retained, in which case
# the return value is always a list.
infer_notation("a -> b", retain_names = TRUE)
# This function is vectorized.
# The list of labels matches
# all known notations in `RCLabels::notations_list`.
infer_notation(c("a -> b", "a (b)", "a [b]", "a [from b]", "a [of b]",
                "a [to b]", "a [in b]", "a [-> b]", "a.b"),
              retain_names = TRUE)
# By default, the most specific notation is returned.
# But when two or more matches are present,
# multiple notations can be returned, too.
infer_notation("a [from b]",
              allow_multiple = TRUE, retain_names = TRUE,
              choose_most_specific = FALSE)
infer_notation(c("a [from b]", "c [to d]"),
              allow_multiple = TRUE, retain_names = TRUE,
              choose_most_specific = FALSE)
# As shown above, "a [from b]" matches 2 notations:
# `RCLabels::bracket_notation` and `RCLabels::from_notation`.
# The default value for the notation argument is
# RCLabels::notations_list,
# which includes `RCLabels::bracket_notation`
# and `RCLabels::from_notation` in that order.
# Thus, there is some flexibility to how this function works
```

```

# if the value of the `notation` argument is a list of notations
# ordered from least specific to most specific,
# as `RCLabels::notations_list` is ordered.
# To review, the next call returns both `RCLabels::bracket_notation` and
# `RCLabels::from_notation`, because `allow_multiple = TRUE` and
# `choose_most_specific = FALSE`, neither of which are default.
infer_notation("a [from b]",
              allow_multiple = TRUE,
              choose_most_specific = FALSE,
              retain_names = TRUE)
# The next call returns `RCLabels::from_notation`, because
# the most specific notation is requested, and
# `RCLabels::from_notation` has more characters in its specification than
# `RCLabels::bracket_notation`.
infer_notation("a [from b]",
              choose_most_specific = TRUE,
              retain_names = TRUE)
# The next call returns the `RCLabels::bracket_notation`, because
# `choose_most_specific = FALSE`, and the first matching
# notation in `RCLabels::notations_list` is `RCLabels::bracket_notation`.
infer_notation("a [from b]",
              choose_most_specific = FALSE,
              retain_names = TRUE)

```

infer_notation_for_one_label

Infer the notation from one row or column label

Description

This is a non-public helper function for vectorized `infer_notation()`.

Usage

```

infer_notation_for_one_label(
  x,
  inf_notation = TRUE,
  notations = RCLabels::notations_list,
  allow_multiple = FALSE,
  retain_names = FALSE,
  choose_most_specific = TRUE,
  must_succeed = TRUE
)

```

Arguments

`x` A single row or column label.

`inf_notation` A boolean that tells whether to infer notation for `x`.

<code>notations</code>	A list of notations from which matches will be inferred Default is <code>RCLabels::notations_list</code> .
<code>allow_multiple</code>	A boolean that tells whether multiple notation matches are allowed. If <code>FALSE</code> (the default), multiple matches give an error.
<code>retain_names</code>	A boolean that tells whether to retain names on the outgoing matches. Default is <code>FALSE</code> . If <code>TRUE</code> , the return value is a named list. If only one of <code>notations</code> is returned, names are never supplied.
<code>choose_most_specific</code>	A boolean that indicates if the most-specific notation will be returned when more than one of <code>notations</code> matches <code>x</code> . Default is <code>TRUE</code> .
<code>must_succeed</code>	A boolean that if <code>TRUE</code> (the default), causes an error to be thrown if a matching notation is not found for any label in <code>x</code> . When <code>FALSE</code> , an unsuccessful label inference will return <code>NULL</code> .

Value

A single matching notation object (if `allow_multiple = FALSE`, the default) or possibly multiple matching notation objects (if `allow_multiple = TRUE`). If no notations match `x`, `NULL`.

<code>in_notation</code>	<i>In notation</i>
--------------------------	--------------------

Description

A description of `in notation`.

Usage

```
in_notation
```

Format

A vector of notational symbols that provides to ("`a [in b]`") notation.

Examples

```
in_notation
```

make_list	<i>Make a list of items in x, regardless of x's type</i>
-----------	--

Description

Repeats x as necessary to make n of them. Does not try to simplify x.

Usage

```
make_list(x, n, lenx = ifelse(is.vector(x), length(x), 1))
```

Arguments

x	The object to be duplicated.
n	The number of times to be duplicated.
lenx	The length of item x. By default, lenx is taken to be length(x),

Details

If x is itself a vector or list, you may want to override the default. For example, if x is a list that should be duplicated several times, set lenx = 1.

Value

A list of x duplicated n times

Examples

```
m <- matrix(c(1:6), nrow=3, dimnames = list(c("r1", "r2", "r3"), c("c2", "c1")))
make_list(m, n = 1)
make_list(m, n = 2)
make_list(m, n = 5)
make_list(list(c(1,2), c(1,2)), n = 4)
m <- matrix(1:4, nrow = 2)
l <- list(m, m+100)
make_list(l, n = 4)
make_list(l, n = 1) # Warning because l is trimmed.
make_list(l, n = 5) # Warning because length(l) (i.e., 2) not evenly divisible by 5
make_list(list(c("r10", "r11"), c("c10", "c11")), n = 2) # Confused by x being a list
make_list(list(c("r10", "r11"), c("c10", "c11")), n = 2, lenx = 1) # Fix by setting lenx = 1
```

make_or_pattern	Create "or" regex patterns
-----------------	----------------------------

Description

This function makes "or" regex patterns from vectors or lists of strings. This function can be used with the `matsbyname::select_rows_byname()` and `matsbyname::select_cols_byname` functions. `make_or_pattern()` correctly escapes special characters in strings, such as `(` and `)`, as needed. Thus, it is highly recommended that `make_or_pattern` be used when constructing patterns for row and column selections with `matsbyname::select_rows_byname()` and `matsbyname::select_cols_byname()`.

Usage

```
make_or_pattern(  
  strings,  
  pattern_type = c("exact", "leading", "trailing", "anywhere", "literal")  
)
```

Arguments

`strings` A vector of row and column names.
`pattern_type` One of "exact", "leading", "trailing", "anywhere", or "literal". Default is "exact".

Details

`pattern_type` controls the type of pattern created:

- `exact` produces a regex pattern that selects row or column names by exact match.
- `leading` produces a regex pattern that selects row or column names if the item in `strings` matches the beginnings of row or column names.
- `trailing` produces a regex pattern that selects row or column names if the item in `strings` matches the ends of row or column names.
- `anywhere` produces a regex pattern that selects row or column names if the item in `strings` matches any substring of row or column names.
- `literal` returns `strings` unmodified, and it is up to the caller to formulate a correct regex.

Value

An "or" regex pattern suitable for selecting row and column names. Amenable for use with `matsbyname::select_rows_byname` or `matsbyname::select_cols_byname`.

Examples

```
make_or_pattern(strings = c("a", "b"), pattern_type = "exact")  
make_or_pattern(strings = c("a", "b"), pattern_type = "leading")  
make_or_pattern(strings = c("a", "b"), pattern_type = "trailing")  
make_or_pattern(strings = c("a", "b"), pattern_type = "anywhere")  
make_or_pattern(strings = c("a", "b"), pattern_type = "literal")
```

modify_label_pieces *Modify pieces of row and column labels*

Description

Typical pieces include "noun" or a preposition, such as "in" or "from". See `RCLabels::prepositions` for additional examples. This argument may be a single string or a character vector.

Usage

```
modify_label_pieces(
  labels,
  piece,
  mod_map,
  prepositions = RCLabels::prepositions_list,
  inf_notation = TRUE,
  notation = RCLabels::bracket_notation,
  choose_most_specific = FALSE
)
```

Arguments

<code>labels</code>	A vector of row or column labels in which pieces will be modified.
<code>piece</code>	The piece (or pieces) of the row or column label that will be modified.
<code>mod_map</code>	A modification map. See details.
<code>prepositions</code>	A list of prepositions, used to detect prepositional phrases. Default is <code>RCLabels::prepositions_list</code> .
<code>inf_notation</code>	A boolean that tells whether to infer notation for x. Default is <code>TRUE</code> . See <code>infer_notation()</code> for details.
<code>notation</code>	The notation type to be used when extracting prepositions. Default is <code>RCLabels::notations_list</code> , meaning that the notation is inferred using <code>infer_notation()</code> .
<code>choose_most_specific</code>	A boolean that tells whether the most specific notation is selected when more than one notation match. Default is <code>FALSE</code> .

Details

This function modifies pieces of row and column labels according to `label_map` that defines "one or many to one" relationships. This function is useful for aggregations. For example, replacing nouns can be done by `modify_label_pieces(labels, piece = "noun", label_map = list(new_noun = c("a", "b", "c"))`. The string "new_noun" will replace any of "a", "b", or "c" when they appear as nouns in a row or column label. See examples for details.

The `mod_map` argument should consist of a named list of character vectors in which names indicate strings to be inserted and values indicate values that should be replaced. The sense is `new = old` or `new = olds`, where "new" is the new name (the replacement) and "old"/"olds" is/are a string/vector of strings, any one of which will be replaced by "new".

Note piece can be "pref"/"suff" or "noun"/"prepositions" If any piece is "pref" or "suff", all pieces are assumed to be a prefix or a suffix. If non of the pieces are "pref" or "suff", all pieces are assumed to be nouns or prepositions, such as "in" or "from". See `RCLabels::prepositions` for additional examples. This argument may be a single string or a character vector.

Value

labels with replacements according to piece and mod_map.

Examples

```
# Simple case
modify_label_pieces("a [of b in c]",
                    piece = "noun",
                    mod_map = list(new_noun = c("a", "b")))
# Works with a vector or list of labels
modify_label_pieces(c("a [of b in c]", "d [-> e in f]"),
                    piece = "noun",
                    mod_map = list(new_noun = c("d", "e")))
# Works with multiple items in the mod_map
modify_label_pieces(c("a [of b in c]", "d [-> e in f]"),
                    piece = "noun",
                    mod_map = list(new_noun1 = c("a", "b", "c"),
                                   new_noun2 = c("d", "e", "f")))
# Works with multiple pieces to be modified
modify_label_pieces(c("a [of b in c]", "d [-> e in f]"),
                    piece = c("noun", "in"),
                    mod_map = list(new_noun = c("a", "b", "c"),
                                   new_in = c("c", "f")))
```

modify_nouns

Modify nouns in labels

Description

This function modifies the nouns of row and column labels. The length of `new_nouns` must be the same as the length of labels.

Usage

```
modify_nouns(
  labels,
  new_nouns,
  inf_notation = TRUE,
  notation = RCLabels::notations_list,
  choose_most_specific = FALSE
)
```

Arguments

labels	The row and column labels in which the nouns will be modified.
new_nouns	The new nouns to be set in labels. Must be same length as labels.
inf_notation	A boolean that tells whether to infer notation for labels. Default is TRUE. See <code>infer_notation()</code> for details.
notation	The notation type to be used when extracting prepositions. Default is <code>RCLabels::notations_list</code> , meaning that the notation is inferred using <code>infer_notation()</code> .
choose_most_specific	A boolean that tells whether to choose the most specific notation from <code>notation</code> when inferring notation. Default is FALSE so that a less specific notation can be inferred. In combination with <code>RCLabels::notations_list</code> , the default value of FALSE means that <code>RCLabels::bracket_notation</code> will be selected instead of anything more specific, such as <code>RCLabels::from_notation</code> .

Value

A character vector of same length as labels with nouns modified to be new_nouns.

Examples

```
labels <- c("a [of b in c]", "d [of e in USA]")
modify_nouns(labels, c("a_plus", "g"))
```

notations_list	<i>Notations list</i>
----------------	-----------------------

Description

A list of all bundled notations. This list is organized by least specific to most specific, thereby enabling some unique behaviors in `infer_notation()`. See the examples for `infer_notation()`.

Usage

```
notations_list
```

Format

A list of bundled notations.

Examples

```
notations_list
```

of_notation

Of notation

Description

A description of of notation.

Usage

of_notation

Format

A vector of notational symbols that provides of ("a [of b]") notation.

Examples

of_notation

paren_notation

Parenthetical notation

Description

A description of parenthetical notation.

Usage

paren_notation

Format

A vector of notational symbols that provides a parenthetical ("a (b)") notation.

Examples

paren_notation

paste_noun_pp	<i>Recombine row and column labels</i>
---------------	--

Description

This function recombines (unplits) row or column labels that have been separated by `split_noun_pp()`.

Usage

```
paste_noun_pp(  
  splt_labels,  
  notation = RCLabels::bracket_notation,  
  squish = TRUE  
)
```

Arguments

<code>splt_labels</code>	A vector of split row or column labels, probably created by <code>split_noun_pp()</code> .
<code>notation</code>	The notation object that describes the labels. Default is <code>RCLabels::bracket_notation</code> .
<code>squish</code>	A boolean that tells whether to remove extra spaces in the output of <code>paste_*()</code> functions. Default is <code>TRUE</code> .

Value

Recombined row and column labels.

Examples

```
labs <- c("a [of b in c]", "d [from Coal mines in USA]")  
labs  
split <- split_noun_pp(labs)  
split  
paste_noun_pp(split)  
# Also works in a data frame  
df <- tibble::tibble(labels = c("a [in b]", "c [of d into USA]",  
                               "e [of f in g]", "h [-> i in j]"))  
recombined <- df %>%  
  dplyr::mutate(  
    splits = split_noun_pp(labels),  
    recombined = paste_noun_pp(splits)  
  )  
all(recombined$labels == recombined$recombined)
```

prepositions	<i>Prepositions</i>
--------------	---------------------

Description

This constant is deprecated. Please use `prepositions_list` instead.

Usage

```
prepositions
```

Format

A vector of prepositions used in row and column labels.

prepositions_list	<i>Prepositions</i>
-------------------	---------------------

Description

Prepositions used in row and column labels.

Usage

```
prepositions_list
```

Format

A vector of prepositions used in row and column labels.

Examples

```
prepositions_list
```

 regex_funcs

Find or replace row or column labels that match a regular expression

Description

`match_by_pattern()` tells whether row or column labels match a regular expression. Internally, `grepl()` decides whether a match occurs. `replace_by_pattern()` replaces portions of row or column labels when a regular expression is matched. Internally, `gsub()` performs the replacements.

Usage

```
match_by_pattern(
  labels,
  regex_pattern,
  pieces = "all",
  prepositions = RCLabels::prepositions_list,
  notation = RCLabels::bracket_notation,
  ...
)
```

```
replace_by_pattern(
  labels,
  regex_pattern,
  replacement,
  pieces = "all",
  prepositions = RCLabels::prepositions_list,
  notation = RCLabels::bracket_notation,
  ...
)
```

Arguments

<code>labels</code>	The row and column labels to be modified.
<code>regex_pattern</code>	The regular expression pattern to determine matches and replacements. Consider using <code>Hmisc::escapeRegex()</code> to escape <code>regex_pattern</code> before calling this function.
<code>pieces</code>	The pieces of row or column labels to be checked for matches or replacements. See details.
<code>prepositions</code>	A vector of strings that count as prepositions. Default is <code>RCLabels::prepositions_list</code> . Used to detect prepositional phrases if <code>pieces</code> are to be interpreted as prepositions.
<code>notation</code>	The notation used in labels. Default is <code>RCLabels::bracket_notation</code> .
<code>...</code>	Other arguments passed to <code>grepl()</code> or <code>gsub()</code> , such as <code>ignore.case</code> , <code>perl</code> , <code>fixed</code> , or <code>useBytes</code> . See examples.
<code>replacement</code>	For <code>replace_by_pattern()</code> , the string that replaces all matches to <code>regex_pattern</code> .

Details

By default (`pieces = "all"`), complete labels (as strings) are checked for matches and replacements. If `pieces == "pref"` or `pieces == "suff"`, only the prefix or the suffix is checked for matches and replacements. Alternatively, `pieces = "noun"` or `pieces = <<preposition>>` indicate that only specific pieces of labels are to be checked for matches and replacements. When `pieces = <<preposition>>`, only the object of `<<preposition>>` is checked for matches and replacement.

`pieces` can be a vector, indicating multiple pieces to be checked for matches and replacements. But if any of the pieces are "all", all pieces are checked and replaced. If `pieces` is "pref" or "suff", only one can be specified.

Value

A logical vector of same length as `labels`, where TRUE indicates a match was found and FALSE indicates otherwise.

Examples

```
labels <- c("Production [of b in c]", "d [of Coal in f]", "g [of h in USA]")
# With default `pieces` argument, matching is done for whole labels.
match_by_pattern(labels, regex_pattern = "Production")
match_by_pattern(labels, regex_pattern = "Coal")
match_by_pattern(labels, regex_pattern = "USA")
# Check beginnings of labels
match_by_pattern(labels, regex_pattern = "^Production")
# Check at ends of labels: no match.
match_by_pattern(labels, regex_pattern = "Production$")
# Can match on nouns or prepositions.
match_by_pattern(labels, regex_pattern = "Production", pieces = "noun")
# Gives FALSE, because "Production" is a noun.
match_by_pattern(labels, regex_pattern = "Production", pieces = "in")
```

`remove_label_pieces` *Remove a prepositional phrase in a row or column label*

Description

This function removes pieces from row and column labels.

Usage

```
remove_label_pieces(
  labels,
  pieces_to_remove,
  prepositions = RCLabels::prepositions_list,
  inf_notation = TRUE,
  notation = RCLabels::notations_list,
  choose_most_specific = FALSE
)
```

Arguments

labels	The row and column labels from which prepositional phrases will be removed.
pieces_to_remove	The names of pieces of the label to be removed, typically "noun" or a preposition such as "of" or "in" See <code>RCLabels::prepositions_list</code> for a list of known prepositions.
prepositions	A list of prepositions, used to detect prepositional phrases. Default is <code>RCLabels::prepositions_list</code> .
inf_notation	A boolean that tells whether to infer notation for x. Default is TRUE. See <code>infer_notation()</code> for details.
notation	The notation type to be used when extracting prepositions. Default is <code>RCLabels::notations_list</code> , meaning that the notation is inferred using <code>infer_notation()</code> .
choose_most_specific	A boolean that tells whether the most specific notation is selected when more than one notation match. Default is FALSE.

Value

labels with pieces removed.

Examples

```
labs <- c("a [of b in c]", "d [-> e in f]")
remove_label_pieces(labs, pieces_to_remove = "of")
remove_label_pieces(labs, pieces_to_remove = c("of", "->"))
remove_label_pieces(labs, pieces_to_remove = c("in", "into"))
remove_label_pieces(labs, pieces_to_remove = c("of", "in"))
```

row-col-notation

Row and column notation

Description

It is often convenient to represent matrix row and column names with notation that includes a prefix and a suffix, with corresponding separators or start-end string sequences. There are several functions to generate specialized versions or otherwise manipulate row and column names on their own or as row or column names.

- `flip_pref_suff()` Switches the location of prefix and suffix, such that the prefix becomes the suffix, and the suffix becomes the prefix. E.g., "a -> b" becomes "b -> a" or "a [b]" becomes "b [a]".
- `get_pref_suff()` Selects only prefix or suffix, discarding notational elements and the rejected part. Internally, this function calls `split_pref_suff()` and selects only the desired portion.
- `notation_vec()` Builds a vector of notation symbols in a standard format. By default, it builds a list of notation symbols that provides an arrow separator (" -> ") between prefix and suffix.

- `paste_pref_suff()` paste θ 's prefixes and suffixes, the inverse of `split_pref_suff()`. Always returns a character vector.
- `preposition_notation()` Builds a list of notation symbols that provides (by default) square brackets around the suffix with a preposition ("prefix [preposition suffix]").
- `split_pref_suff()` Splits prefixes from suffixes, returning each in a list with names `pref` and `suff`. If no prefix or suffix delimiters are found, `x` is returned in the `pref` item, unmodified, and the `suff` item is returned as "" (an empty string). If there is no prefix, and empty string is returned for the `pref` item. If there is no suffix, and empty string is returned for the `suff` item.
- `switch_notation()` Switches from one type of notation to another based on the `from` and `to` arguments. Optionally, `prefix` and `suffix` can be flipped.

Parts of a notation vector are "pref_start", "pref_end", "suff_start", and "suff_end". None of the strings in a notation vector are considered part of the prefix or suffix. E.g., "a -> b" in arrow notation means that "a" is the prefix and "b" is the suffix. If `sep` only is specified for `notation_vec()` (default is " -> "), `pref_start`, `pref_end`, `suff_start`, and `suff_end` are set appropriately.

For functions where the notation argument is used to identify portions of the row or column label (such as `split_pref_suff()`, `get_pref_suff()`, and the `from` argument to `switch_notation()`), (Note: `flip_pref_suff()` cannot infer notation, because it switches prefix and suffix in a known, single notation.) if notation is a list, it is treated as a store from which the most appropriate notation is inferred by `infer_notation(choose_most_specific = TRUE)`. Because default is `RCLabels::notations_list`, notation is inferred by default. The argument `choose_most_specific` tells what to do when two notations match a label: if TRUE (the default), the notation with most characters is selected. If FALSE, the first matching notation in notation will be selected. See details at `infer_notation()`.

For functions that construct labels (such as `paste_pref_suff()`), notation can be a list of notations over which the paste tasks is mapped. If notation is a list, it must have as many items as there are prefix/suffix pairs to be pasted.

If either `pref` or `suff` are a zero-length character vector (essentially an empty character vector such as obtained from `character()`) input to `paste_pref_suff()`, an error is thrown. Instead, use an empty character string (such as obtained from "").

Usage

```
notation_vec(
  sep = " -> ",
  pref_start = "",
  pref_end = "",
  suff_start = "",
  suff_end = ""
)

preposition_notation(preposition, suff_start = " [", suff_end = "]"")

split_pref_suff(
  x,
  transpose = FALSE,
```

```

    inf_notation = TRUE,
    notation = RCLabels::notations_list,
    choose_most_specific = TRUE
  )

paste_pref_suff(
  ps = list(pref = pref, suff = suff),
  pref = NULL,
  suff = NULL,
  notation = RCLabels::arrow_notation,
  squish = TRUE
)

flip_pref_suff(
  x,
  notation = RCLabels::notations_list,
  inf_notation = TRUE,
  choose_most_specific = TRUE
)

get_pref_suff(
  x,
  which = c("pref", "suff"),
  inf_notation = TRUE,
  notation = RCLabels::notations_list,
  choose_most_specific = TRUE
)

switch_notation(
  x,
  from = RCLabels::notations_list,
  to,
  flip = FALSE,
  inf_notation = TRUE
)

```

Arguments

sep	A string separator between prefix and suffix. Default is "->".
pref_start	A string indicating the start of a prefix. Default is NULL.
pref_end	A string indicating the end of a prefix. Default is the value of sep.
suff_start	A string indicating the start of a suffix. Default is the value of sep.
suff_end	A string indicating the end of a suffix. Default is NULL.
preposition	A string used to indicate position for energy flows, typically "from" or "to" in different notations.
x	A string or vector of strings to be operated upon.

<code>transpose</code>	A boolean that tells whether to <code>purrr::transpose()</code> the result. Set <code>transpose = TRUE</code> when using <code>split_pref_suff()</code> in a <code>dplyr::mutate()</code> call in the context of a data frame. Default is <code>FALSE</code> .
<code>inf_notation</code>	A boolean that tells whether to infer notation for <code>x</code> . Default is <code>TRUE</code> . See <code>infer_notation()</code> for details.
<code>notation</code>	A notation vector generated by one of the <code>*_notation()</code> functions, such as <code>notation_vec()</code> , <code>arrow_notation</code> , or <code>bracket_notation</code> .
<code>choose_most_specific</code>	A boolean that tells whether to choose the most specific notation from the <code>notation</code> argument when the <code>notation</code> argument is a list.
<code>ps</code>	A list of prefixes and suffixes in which each item of the list is itself a list with two items named <code>pref</code> and <code>suff</code> .
<code>pref</code>	A string or list of strings that are prefixes. Default is <code>NULL</code> .
<code>suff</code>	A string or list of strings that are suffixes. Default is <code>NULL</code> .
<code>squish</code>	A boolean that tells whether to remove extra spaces in the output of <code>paste_*()</code> functions. Default is <code>TRUE</code> .
<code>which</code>	Tells which to keep, the prefix (" <code>pref</code> ") or the suffix (" <code>suff</code> ").
<code>from</code>	The notation to switch <i>away from</i> .
<code>to</code>	The notation to switch <i>to</i> .
<code>flip</code>	A boolean that tells whether to also flip the notation. Default is <code>FALSE</code> .

Value

For `notation_vec()`, `arrow_notation`, and `bracket_notation`, a string vector with named items `pref_start`, `pref_end`, `suff_start`, and `suff_end`; For `split_pref_suff()`, a string list with named items `pref` and `suff`. For `paste_pref_suff()`, `split_pref_suff()`, and `switch_notation()`, a string list in notation format specified by various notation arguments, including `from`, and `to`. For `keep_pref_suff`, one of the prefix or suffix or a list of prefixes or suffixes.

Examples

```
notation_vec()
arrow_notation
bracket_notation
split_pref_suff("a -> b", notation = arrow_notation)
# Or infer the notation (by default from notations_list)
split_pref_suff("a -> b")
split_pref_suff(c("a -> b", "c -> d", "e -> f"))
split_pref_suff(c("a -> b", "c -> d", "e -> f"), transpose = TRUE)
flip_pref_suff("a [b]", notation = bracket_notation)
# Infer notation
flip_pref_suff("a [b]")
get_pref_suff("a -> b", which = "suff")
switch_notation("a -> b", from = arrow_notation, to = bracket_notation)
# Infer notation and flip prefix and suffix
switch_notation("a -> b", to = bracket_notation, flip = TRUE)
# Also works for vectors
```

```

switch_notation(c("a -> b", "c -> d"),
               from = arrow_notation,
               to = bracket_notation)
# Functions can infer the correct notation and return multiple matches
infer_notation("a [to b]",
              allow_multiple = TRUE,
              choose_most_specific = FALSE)
# Or choose the most specific notation
infer_notation("a [to b]",
              allow_multiple = TRUE,
              choose_most_specific = TRUE)
# When setting the from notation, only that type of notation will be switched
switch_notation(c("a -> b", "c [to d]"),
               from = arrow_notation,
               to = bracket_notation)
# But if notations are inferred, all notations can be switched
switch_notation(c("a -> b", "c [to d]"), to = bracket_notation)
# A double-switch can be accomplished.
# In this first example, `RCLabels::first_dot_notation` is inferred.
switch_notation("a.b.c", to = arrow_notation)
# In this second example,
# it is easier to specify the `from` and `to` notations.
switch_notation("a.b.c", to = arrow_notation) %>%
  switch_notation(from = first_dot_notation, to = arrow_notation)
# "" can be used as an input
paste_pref_suff(pref = "a", suff = "", notation = RCLabels::from_notation)

```

split_noun_pp

Split row and column labels into nouns and prepositional phrases

Description

This function is similar to `split_pref_suff()` in that it returns a list. However, this function's list is more detailed than `split_pref_suff()`. The return value from this function is a list with the first named item being the prefix (with the name `noun`) followed by objects of prepositional phrases (with names being prepositions that precede the objects).

Usage

```

split_noun_pp(
  labels,
  inf_notation = TRUE,
  notation = RCLabels::notations_list,
  choose_most_specific = FALSE,
  prepositions = RCLabels::prepositions_list
)

```

Arguments

labels	The row and column labels from which prepositional phrases are to be extracted.
inf_notation	A boolean that tells whether to infer notation for x. Default is TRUE. See infer_notation() for details.
notation	The notation type to be used when extracting prepositions. Default is RCLabels::notations_list, meaning that the notation is inferred using infer_notation().
choose_most_specific	A boolean that tells whether to choose the most specific notation from notation when inferring notation. Default is FALSE so that a less specific notation can be inferred. In combination with RCLabels::notations_list, the default value of FALSE means that RCLabels::bracket_notation will be selected instead of anything more specific, such as RCLabels::from_notation.
prepositions	A vector of strings to be treated as prepositions. Note that a space is appended to each word internally, so, e.g., "to" becomes "to ". Default is RCLabels::prepositions_list.

Details

Unlike split_pref_suff(), it does not make sense to have a transpose argument on split_noun_pp(). Labels may not have the same structure, e.g., they may have different prepositions.

Value

A list of lists with items named noun and pp.

Examples

```
# Specify the notation
split_noun_pp(c("a [of b in c]", "d [of e into f]"),
             notation = bracket_notation)
# Infer the notation via default arguments
split_noun_pp(c("a [of b in c]", "d [of e into f]"))
```

strip_label_part	<i>A convenience function to help splitting prefixes and suffixes</i>
------------------	---

Description

This function should only ever see a single label (x) and a single notation.

Usage

```
strip_label_part(x, notation, part, pattern_pref = "", pattern_suff = "")
```

Arguments

x	The label(s) to be split.
notation	The notations to be used for each x.
part	The part of the label to work on, such as "pref_start", "pref_end", "suff_start", or "suff_end".
pattern_pref	The prefix to a regex pattern to be used in gsub().
pattern_suff	The suffix to a regex pattern to be used in gsub().

Details

If notation is NULL, x is returned, unmodified.

Value

A label shorn of the part to be stripped.

to_notation	<i>To notation</i>
-------------	--------------------

Description

A description of to notation.

Usage

```
to_notation
```

Format

A vector of notational symbols that provides to ("a [to b]") notation.

Examples

```
to_notation
```

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