

Package ‘tidyselect’

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Title Select from a Set of Strings

Version 1.1.1

Description A backend for the selecting functions of the 'tidyverse'.
It makes it easy to implement select-like functions in your own packages in a way that is consistent with other 'tidyverse' interfaces for selection.

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all_of	<i>Select variables from character vectors</i>
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Description

These [selection helpers](#) select variables contained in a character vector. They are especially useful for programming with selecting functions.

- `all_of()` is for strict selection. If any of the variables in the character vector is missing, an error is thrown.
- `any_of()` doesn't check for missing variables. It is especially useful with negative selections, when you would like to make sure a variable is removed.

The order of selected columns is determined by the order in the vector.

Usage

```
all_of(x)
```

```
any_of(x, ..., vars = NULL)
```

Arguments

x	A vector of character names or numeric locations.
...	These dots are for future extensions and must be empty.
vars	A character vector of variable names. If not supplied, the variables are taken from the current selection context (as established by functions like <code>select()</code> or <code>pivot_longer()</code>).

Examples

Selection helpers can be used in functions like `dplyr::select()` or `tidyr::pivot_longer()`.
Let's first attach the tidyverse:

```
library(tidyverse)

# For better printing
iris <- as_tibble(iris)
```

It is a common to have a names of variables in a vector.

```
vars <- c("Sepal.Length", "Sepal.Width")
```

```
iris[, vars]
#> # A tibble: 150 x 2
#>   Sepal.Length Sepal.Width
#>   <dbl>         <dbl>
#> 1         5.1         3.5
#> 2         4.9         3
#> 3         4.7         3.2
#> 4         4.6         3.1
#> # ... with 146 more rows
```

To refer to these variables in selecting function, use `all_of()`:

```
iris %>% select(all_of(vars))
#> # A tibble: 150 x 2
#>   Sepal.Length Sepal.Width
#>   <dbl>         <dbl>
#> 1         5.1         3.5
#> 2         4.9         3
#> 3         4.7         3.2
#> 4         4.6         3.1
#> # ... with 146 more rows
```

```
iris %>% pivot_longer(all_of(vars))
#> # A tibble: 300 x 5
#>   Petal.Length Petal.Width Species name      value
#>   <dbl>         <dbl> <fct>   <chr>         <dbl>
#> 1         1.4         0.2 setosa Sepal.Length  5.1
#> 2         1.4         0.2 setosa Sepal.Width   3.5
#> 3         1.4         0.2 setosa Sepal.Length  4.9
#> 4         1.4         0.2 setosa Sepal.Width   3
#> # ... with 296 more rows
```

If any of the variable is missing from the data frame, that's an error:

```
starwars %>% select(all_of(vars))
```

```
## Error: Can't subset columns that don't exist.
## x Columns `Sepal.Length` and `Sepal.Width` don't exist.
```

Use `any_of()` to allow missing variables:

```
starwars %>% select(any_of(vars))
#> # A tibble: 87 x 0
```

`any_of()` is especially useful to remove variables from a data frame because calling it again does not cause an error:

```
iris %>% select(-any_of(vars))
#> # A tibble: 150 x 3
#>   Petal.Length Petal.Width Species
#>   <dbl>         <dbl> <fct>
#> 1         1.4         0.2 setosa
#> 2         1.4         0.2 setosa
#> 3         1.3         0.2 setosa
#> 4         1.5         0.2 setosa
#> # ... with 146 more rows
```

```
iris %>% select(-any_of(vars)) %>% select(-any_of(vars))
#> # A tibble: 150 x 3
#>   Petal.Length Petal.Width Species
#>   <dbl>         <dbl> <fct>
#> 1         1.4         0.2 setosa
#> 2         1.4         0.2 setosa
#> 3         1.3         0.2 setosa
#> 4         1.5         0.2 setosa
#> # ... with 146 more rows
```

See Also

The [selection language](#) page, which includes links to other selection helpers.

eval_rename

Evaluate an expression with tidyselect semantics

Description

`eval_select()` and `eval_rename()` evaluate defused R code (i.e. quoted expressions) according to the special rules of the [tidyselect syntax](#). They power functions like `dplyr::select()`, `dplyr::rename()`, or `tidyr::pivot_longer()`.

See the [Get started](#) vignette to learn how to use `eval_select()` and `eval_rename()` in your packages.

Usage

```
eval_rename(
  expr,
  data,
  env = caller_env(),
  ...,
  strict = TRUE,
  name_spec = NULL
)

eval_select(
  expr,
  data,
  env = caller_env(),
  ...,
  include = NULL,
  exclude = NULL,
  strict = TRUE,
  name_spec = NULL,
  allow_rename = TRUE
)
```

Arguments

expr	Defused R code describing a selection according to the tidysselect syntax.
data	A named list, data frame, or atomic vector. Technically, data can be any vector with names() and "[[" implementations.
env	The environment in which to evaluate expr. Discarded if expr is a quosure .
...	These dots are for future extensions and must be empty.
strict	If TRUE, out-of-bounds errors are thrown if expr attempts to select or rename a variable that doesn't exist. If FALSE, failed selections or renamings are ignored.
name_spec	A name specification describing how to combine or propagate names. This is used only in case nested c() expressions like c(foo = c(bar = starts_with("foo"))). See the name_spec argument of vctrs::vec_c() for a description of valid name specs.
include, exclude	Character vector of column names to always include or exclude from the selection.
allow_rename	If TRUE (the default), the renaming syntax c(foo = bar) is allowed. If FALSE, it causes an error. This is useful to implement purely selective behaviour.

Details

The select and rename variants take the same types of inputs and have the same type of return value. However eval_rename() has a few extra constraints. It requires named inputs, and will fail if a data frame column is renamed to another existing column name. See the [selecting versus renaming](#) section in the syntax vignette for a description of the differences.

Value

A named vector of numeric locations, one for each of the selected elements.

The names are normally the same as in the input data, except when the user supplied named selections with `c()`. In the latter case, the names reflect the new names chosen by the user.

A given element may be selected multiple times under different names, in which case the vector might contain duplicate locations.

See Also

<https://tidyselect.r-lib.org/articles/syntax.html> or `vignette("syntax", package = "tidyselect")` for a technical description of the rules of evaluation.

Examples

```
library(rlang)

# Interpret defused code as selection:
x <- expr(mpg:cyl)
eval_select(x, mtcars)

# Interpret defused code as a renaming selection. All inputs must
# be named within `c()`:
try(eval_rename(expr(mpg), mtcars))
eval_rename(expr(c(foo = mpg)), mtcars)

# Within a function, use `enquo()` to defuse one argument:
my_function <- function(x, expr) {
  eval_select(enquo(expr), x)
}

# If your function takes dots, evaluate a defused call to `c(...)`
# with `expr(c(...))`:
my_function <- function(.x, ...) {
  eval_select(expr(c(...)), .x)
}

# If your function takes dots and a named argument, use `{{ }}`
# inside the defused expression to tunnel it inside the tidyselect DSL:
my_function <- function(.x, .expr, ...) {
  eval_select(expr(c({{ .expr }}), ...), .x)
}

# Note that the trick above works because `expr({{ arg }})` is the
# same as `enquo(arg)`.

# The evaluators return a named vector of locations. Here are
# examples of using these location vectors to implement `select()`
# and `rename()`:
select <- function(.x, ...) {
```

```
    pos <- eval_select(expr(c(...)), .x)
    set_names(.x[pos], names(pos))
  }
  rename <- function(.x, ...) {
    pos <- eval_rename(expr(c(...)), .x)
    names(.x)[pos] <- names(pos)
    .x
  }

  select(mtcars, mpg:cyl)
  rename(mtcars, foo = mpg)
```

everything

Select all variables or the last variable

Description

These functions are [selection helpers](#).

- `everything()` selects all variable. It is also useful in combination with other tidyselect operators.
- `last_col()` selects the last variable.

Usage

```
everything(vars = NULL)
```

```
last_col(offset = 0L, vars = NULL)
```

Arguments

<code>vars</code>	A character vector of variable names. If not supplied, the variables are taken from the current selection context (as established by functions like <code>select()</code> or <code>pivot_longer()</code>).
<code>offset</code>	Set it to <code>n</code> to select the <code>n</code> th var from the end.

Examples

Selection helpers can be used in functions like `dplyr::select()` or `tidyr::pivot_longer()`. Let's first attach the tidyverse:

```
library(tidyverse)

# For better printing
iris <- as_tibble(iris)
mtcars <- as_tibble(mtcars)
```

Use `everything()` to select all variables:

```
iris %>% select(everything())
#> # A tibble: 150 x 5
#>   Sepal.Length Sepal.Width Petal.Length Petal.Width Species
#>   <dbl>         <dbl>         <dbl>         <dbl> <fct>
#> 1         5.1         3.5           1.4           0.2 setosa
#> 2         4.9         3             1.4           0.2 setosa
#> 3         4.7         3.2           1.3           0.2 setosa
#> 4         4.6         3.1           1.5           0.2 setosa
#> # ... with 146 more rows
```

```
mtcars %>% pivot_longer(everything())
#> # A tibble: 352 x 2
#>   name value
#>   <chr> <dbl>
#> 1 mpg    21
#> 2 cyl     6
#> 3 disp  160
#> 4 hp    110
#> # ... with 348 more rows
```

Use `last_col()` to select the last variable:

```
iris %>% select(last_col())
#> # A tibble: 150 x 1
#>   Species
#>   <fct>
#> 1 setosa
#> 2 setosa
#> 3 setosa
#> 4 setosa
#> # ... with 146 more rows
```

```
mtcars %>% pivot_longer(last_col())
#> # A tibble: 32 x 12
#>   mpg  cyl disp  hp drat  wt  qsec  vs  am gear name value
#>   <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <chr> <dbl>
#> 1  21     6  160  110  3.9  2.62  16.5  0    1    4 carb    4
#> 2  21     6  160  110  3.9  2.88  17.0  0    1    4 carb    4
#> 3  22.8   4  108   93  3.85  2.32  18.6  1    1    4 carb    1
#> 4  21.4   6  258  110  3.08  3.22  19.4  1    0    3 carb    1
#> # ... with 28 more rows
```

Supply an offset `n` to select a variable located `n` positions from the end:

```
mtcars %>% select(1:last_col(5))
#> # A tibble: 32 x 6
#>   mpg  cyl disp  hp drat  wt
#>   <dbl> <dbl> <dbl> <dbl> <dbl> <dbl>
#> 1  21     6  160  110  3.9  2.62
```



```
#> 2 21      6  160  110  3.9  2.88
#> 3 22.8    4  108   93  3.85  2.32
#> 4 21.4    6  258  110  3.08  3.22
#> # ... with 28 more rows
```

See Also

The [selection language](#) page, which includes links to other selection helpers.

faq-external-vector *FAQ - Note: Using an external vector in selections is ambiguous*

Description

Ambiguity between columns and external variables:

With selecting functions like `dplyr::select()` or `tidyr::pivot_longer()`, you can refer to variables by name:

```
mtcars %>% select(cyl, am, vs)
#> # A tibble: 32 x 3
#>   cyl  am  vs
#>   <dbl> <dbl> <dbl>
#> 1     6    1    0
#> 2     6    1    0
#> 3     4    1    1
#> 4     6    0    1
#> # ... with 28 more rows
```

```
mtcars %>% select(mpg:disp)
#> # A tibble: 32 x 3
#>   mpg  cyl  disp
#>   <dbl> <dbl> <dbl>
#> 1  21     6  160
#> 2  21     6  160
#> 3 22.8    4  108
#> 4 21.4    6  258
#> # ... with 28 more rows
```

For historical reasons, it is also possible to refer an external vector of variable names. You get the correct result, but with a note informing you that selecting with an external variable is ambiguous because it is not clear whether you want a data frame column or an external object.

```
vars <- c("cyl", "am", "vs")
result <- mtcars %>% select(vars)
#> Note: Using an external vector in selections is ambiguous.
#> i Use `all_of(vars)` instead of `vars` to silence this message.
#> i See <https://tidyselect.r-lib.org/reference/faq-external-vector.html>.
#> This message is displayed once per session.
```

This note will become a warning in the future, and then an error. We have decided to deprecate this particular approach to using external vectors because they introduce ambiguity. Imagine that the data frame contains a column with the same name as your external variable.

```
some_df <- mtcars[1:4, ]
some_df$vars <- 1:nrow(some_df)
```

These are very different objects but it isn't a problem if the context forces you to be specific about where to find vars:

```
vars
#> [1] "cyl" "am" "vs"
```

```
some_df$vars
#> [1] 1 2 3 4
```

In a selection context however, the column wins:

```
some_df %>% select(vars)
#> # A tibble: 4 x 1
#>   vars
#>   <int>
#> 1     1
#> 2     2
#> 3     3
#> 4     4
```

Fixing the ambiguity:

To make your selection code more robust and silence the message, use `all_of()` to force the external vector:

```
some_df %>% select(all_of(vars))
#> # A tibble: 4 x 3
#>   cyl   am  vs
#>   <dbl> <dbl> <dbl>
#> 1     6     1     0
#> 2     6     1     0
#> 3     4     1     1
#> 4     6     0     1
```

For more information or if you have comments about this, please see the [Github issue](#) tracking the deprecation process.

Description

Functions like `starts_with()`, `contains()` or `matches()` are **selection helpers** that only work in a selection context.

Examples of valid selection contexts are:

- Inside `dplyr::select()`.
- The `cols` argument of `tidyr::pivot_longer()`.

Using a selection helper anywhere else results in an error:

```
starts_with("foo")
#> Error: `starts_with()` must be used within a *selecting* function.
#> i See <https://tidyselect.r-lib.org/reference/faq-selection-context.html>.
```

```
mtcars[contains("foo")]
#> Error: `contains()` must be used within a *selecting* function.
#> i See <https://tidyselect.r-lib.org/reference/faq-selection-context.html>.
```

```
subset(mtcars, select = matches("foo"))
#> Error: `matches()` must be used within a *selecting* function.
#> i See <https://tidyselect.r-lib.org/reference/faq-selection-context.html>.
```

If you see this error, you've probably used a selection helper in the wrong place, possibly as the result of a typo (e.g. misplaced comma or wrong argument name).

language

Selection language

Description

Overview of selection features::

Tidyverse selections implement a dialect of R where operators make it easy to select variables:

- `:` for selecting a range of consecutive variables.
- `!` for taking the complement of a set of variables.
- `&` and `|` for selecting the intersection or the union of two sets of variables.
- `c()` for combining selections.

In addition, you can use **selection helpers**. Some helpers select specific columns:

- `everything()`: Matches all variables.
- `last_col()`: Select last variable, possibly with an offset.

These helpers select variables by matching patterns in their names:

- `starts_with()`: Starts with a prefix.
- `ends_with()`: Ends with a suffix.
- `contains()`: Contains a literal string.
- `matches()`: Matches a regular expression.

- `num_range()`: Matches a numerical range like `x01`, `x02`, `x03`.

These helpers select variables from a character vector:

- `all_of()`: Matches variable names in a character vector. All names must be present, otherwise an out-of-bounds error is thrown.
- `any_of()`: Same as `all_of()`, except that no error is thrown for names that don't exist.

This helper selects variables with a function:

- `where()`: Applies a function to all variables and selects those for which the function returns `TRUE`.

Simple examples

Here we show the usage for the basic selection operators. See the specific help pages to learn about helpers like `starts_with()`.

The selection language can be used in functions like `dplyr::select()` or `tidyr::pivot_longer()`. Let's first attach the tidyverse:

```
library(tidyverse)

# For better printing
iris <- as_tibble(iris)
```

Select variables by name:

```
starwars %>% select(height)
#> # A tibble: 87 x 1
#>   height
#>   <int>
#> 1    172
#> 2    167
#> 3     96
#> 4    202
#> # ... with 83 more rows
```

```
iris %>% pivot_longer(Sepal.Length)
#> # A tibble: 150 x 6
#>   Sepal.Width Petal.Length Petal.Width Species name      value
#>   <dbl>         <dbl>         <dbl> <fct>   <chr>    <dbl>
#> 1     3.5         1.4           0.2 setosa Sepal.Length  5.1
#> 2     3          1.4           0.2 setosa Sepal.Length  4.9
#> 3     3.2         1.3           0.2 setosa Sepal.Length  4.7
#> 4     3.1         1.5           0.2 setosa Sepal.Length  4.6
#> # ... with 146 more rows
```

Select multiple variables by separating them with commas. Note how the order of columns is determined by the order of inputs:

```
starwars %>% select(homeworld, height, mass)
#> # A tibble: 87 x 3
#>   homeworld height  mass
#>   <chr>      <int> <dbl>
#> 1 Tatooine    172    77
#> 2 Tatooine    167    75
#> 3 Naboo       96     32
#> 4 Tatooine    202   136
#> # ... with 83 more rows
```

Functions like `tidyr::pivot_longer()` don't take variables with dots. In this case use `c()` to select multiple variables:

```
iris %>% pivot_longer(c(Sepal.Length, Petal.Length))
#> # A tibble: 300 x 5
#>   Sepal.Width Petal.Width Species name          value
#>   <dbl>        <dbl> <fct> <chr>         <dbl>
#> 1         3.5         0.2 setosa Sepal.Length  5.1
#> 2         3.5         0.2 setosa Petal.Length  1.4
#> 3          3         0.2 setosa Sepal.Length  4.9
#> 4          3         0.2 setosa Petal.Length  1.4
#> # ... with 296 more rows
```

Operators::

The `:` operator selects a range of consecutive variables:

```
starwars %>% select(name:mass)
#> # A tibble: 87 x 3
#>   name          height  mass
#>   <chr>          <int> <dbl>
#> 1 Luke Skywalker    172    77
#> 2 C-3PO             167    75
#> 3 R2-D2             96     32
#> 4 Darth Vader      202   136
#> # ... with 83 more rows
```

The `!` operator negates a selection:

```
starwars %>% select(!(name:mass))
#> # A tibble: 87 x 11
#>   hair_color skin_color eye_color birth_year sex  gender homeworld species
#>   <chr>      <chr>      <chr>      <dbl> <chr> <chr> <chr> <chr>
#> 1 blond     fair        blue        19  male mascul~ Tatooine Human
#> 2 <NA>     gold        yellow      112 none mascul~ Tatooine Droid
#> 3 <NA>     white, bl~ red        33  none mascul~ Naboo   Droid
#> 4 none     white       yellow      41.9 male mascul~ Tatooine Human
#> # ... with 83 more rows, and 3 more variables: films <list>, vehicles <list>,
#> #   starships <list>
```

```
iris %>% select(!c(Sepal.Length, Petal.Length))
```

```
#> # A tibble: 150 x 3
#>   Sepal.Width Petal.Width Species
#>   <dbl>         <dbl> <fct>
#> 1     3.5         0.2 setosa
#> 2     3           0.2 setosa
#> 3     3.2         0.2 setosa
#> 4     3.1         0.2 setosa
#> # ... with 146 more rows
```

```
iris %>% select(!ends_with("Width"))
#> # A tibble: 150 x 3
#>   Sepal.Length Petal.Length Species
#>   <dbl>         <dbl> <fct>
#> 1     5.1         1.4 setosa
#> 2     4.9         1.4 setosa
#> 3     4.7         1.3 setosa
#> 4     4.6         1.5 setosa
#> # ... with 146 more rows
```

& and | take the intersection or the union of two selections:

```
iris %>% select(starts_with("Petal") & ends_with("Width"))
#> # A tibble: 150 x 1
#>   Petal.Width
#>   <dbl>
#> 1     0.2
#> 2     0.2
#> 3     0.2
#> 4     0.2
#> # ... with 146 more rows
```

```
iris %>% select(starts_with("Petal") | ends_with("Width"))
#> # A tibble: 150 x 3
#>   Petal.Length Petal.Width Sepal.Width
#>   <dbl>         <dbl>     <dbl>
#> 1     1.4         0.2       3.5
#> 2     1.4         0.2       3
#> 3     1.3         0.2       3.2
#> 4     1.5         0.2       3.1
#> # ... with 146 more rows
```

To take the difference between two selections, combine the & and ! operators:

```
iris %>% select(starts_with("Petal") & !ends_with("Width"))
#> # A tibble: 150 x 1
#>   Petal.Length
#>   <dbl>
#> 1     1.4
#> 2     1.4
#> 3     1.3
#> 4     1.5
```

```
#> # ... with 146 more rows
```

Details

The order of selected columns is determined by the inputs.

- `all_of(c("foo", "bar"))` selects "foo" first.
- `c(starts_with("c"), starts_with("d"))` selects all columns starting with "c" first, then all columns starting with "d".

peek_vars

Peek at variables in the selection context

Description

- `peek_vars()` returns the vector of names of the variables currently available for selection.
- `peek_data()` returns the whole input vector (only available with `eval_select()`).

Read the [Get started](#) for examples of how to create selection helpers with `peek_vars()`.

The variable names in a selection context are registered automatically by `eval_select()` and `eval_rename()` for the duration of the evaluation. `peek_vars()` is the glue that connects [selection helpers](#) to the current selection context.

Usage

```
peek_vars(..., fn = NULL)
```

```
peek_data(..., fn = NULL)
```

Arguments

- ... These dots are for future extensions and must be empty.
- fn The name of the function to use in error messages when the helper is used in the wrong context. If not supplied, a generic error message is used instead.

 starts_with

Select variables that match a pattern

Description

These [selection helpers](#) match variables according to a given pattern.

- `starts_with()`: Starts with a prefix.
- `ends_with()`: Ends with a suffix.
- `contains()`: Contains a literal string.
- `matches()`: Matches a regular expression.
- `num_range()`: Matches a numerical range like x01, x02, x03.

Usage

```
starts_with(match, ignore.case = TRUE, vars = NULL)
```

```
ends_with(match, ignore.case = TRUE, vars = NULL)
```

```
contains(match, ignore.case = TRUE, vars = NULL)
```

```
matches(match, ignore.case = TRUE, perl = FALSE, vars = NULL)
```

```
num_range(prefix, range, width = NULL, vars = NULL)
```

Arguments

match	A character vector. If length > 1, the union of the matches is taken.
ignore.case	If TRUE, the default, ignores case when matching names.
vars	A character vector of variable names. If not supplied, the variables are taken from the current selection context (as established by functions like <code>select()</code> or <code>pivot_longer()</code>).
perl	Should Perl-compatible regexps be used?
prefix	A prefix that starts the numeric range.
range	A sequence of integers, like 1:5.
width	Optionally, the "width" of the numeric range. For example, a range of 2 gives "01", a range of three "001", etc.

Examples

Selection helpers can be used in functions like `dplyr::select()` or `tidyr::pivot_longer()`. Let's first attach the tidyverse:


```
library(tidyverse)
```

```
# For better printing
iris <- as_tibble(iris)
```

starts_with() selects all variables matching a prefix and ends_with() matches a suffix:

```
iris %>% select(starts_with("Sepal"))
#> # A tibble: 150 x 2
#>   Sepal.Length Sepal.Width
#>   <dbl>         <dbl>
#> 1         5.1         3.5
#> 2         4.9         3
#> 3         4.7         3.2
#> 4         4.6         3.1
#> # ... with 146 more rows
```

```
iris %>% select(ends_with("Width"))
#> # A tibble: 150 x 2
#>   Sepal.Width Petal.Width
#>   <dbl>         <dbl>
#> 1         3.5         0.2
#> 2         3         0.2
#> 3         3.2         0.2
#> 4         3.1         0.2
#> # ... with 146 more rows
```

You can supply multiple prefixes or suffixes. Note how the order of variables depends on the order of the suffixes and prefixes:

```
iris %>% select(starts_with(c("Petal", "Sepal")))
#> # A tibble: 150 x 4
#>   Petal.Length Petal.Width Sepal.Length Sepal.Width
#>   <dbl>         <dbl>         <dbl>         <dbl>
#> 1         1.4         0.2         5.1         3.5
#> 2         1.4         0.2         4.9         3
#> 3         1.3         0.2         4.7         3.2
#> 4         1.5         0.2         4.6         3.1
#> # ... with 146 more rows
```

```
iris %>% select(ends_with(c("Width", "Length")))
#> # A tibble: 150 x 4
#>   Sepal.Width Petal.Width Sepal.Length Petal.Length
#>   <dbl>         <dbl>         <dbl>         <dbl>
#> 1         3.5         0.2         5.1         1.4
#> 2         3         0.2         4.9         1.4
#> 3         3.2         0.2         4.7         1.3
#> 4         3.1         0.2         4.6         1.5
#> # ... with 146 more rows
```

contains() selects columns whose names contain a word:

```
iris %>% select(contains("al"))
#> # A tibble: 150 x 4
#>   Sepal.Length Sepal.Width Petal.Length Petal.Width
#>   <dbl>         <dbl>         <dbl>         <dbl>
#> 1         5.1         3.5           1.4           0.2
#> 2         4.9         3             1.4           0.2
#> 3         4.7         3.2           1.3           0.2
#> 4         4.6         3.1           1.5           0.2
#> # ... with 146 more rows
```

These helpers do not use regular expressions. To select with a regexp use matches()

```
# [pt] is matched literally:
iris %>% select(contains("[pt]al"))
#> # A tibble: 150 x 0
```

```
# [pt] is interpreted as a regular expression
iris %>% select(matches("[pt]al"))
#> # A tibble: 150 x 4
#>   Sepal.Length Sepal.Width Petal.Length Petal.Width
#>   <dbl>         <dbl>         <dbl>         <dbl>
#> 1         5.1         3.5           1.4           0.2
#> 2         4.9         3             1.4           0.2
#> 3         4.7         3.2           1.3           0.2
#> 4         4.6         3.1           1.5           0.2
#> # ... with 146 more rows
```

starts_with() selects all variables starting with a prefix. To select a range, use num_range(). Compare:

```
billboard %>% select(starts_with("wk"))
#> # A tibble: 317 x 76
#>   wk1  wk2  wk3  wk4  wk5  wk6  wk7  wk8  wk9  wk10 wk11 wk12 wk13
#>   <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl>
#> 1    87   82   72   77   87   94   99   NA   NA   NA   NA   NA   NA
#> 2    91   87   92   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA
#> 3    81   70   68   67   66   57   54   53   51   51   51   51   47
#> 4    76   76   72   69   67   65   55   59   62   61   61   59   61
#> # ... with 313 more rows, and 63 more variables: wk14 <dbl>, wk15 <dbl>,
#> #   wk16 <dbl>, wk17 <dbl>, wk18 <dbl>, wk19 <dbl>, wk20 <dbl>, wk21 <dbl>, ...
```

```
billboard %>% select(num_range("wk", 10:15))
#> # A tibble: 317 x 6
#>   wk10 wk11 wk12 wk13 wk14 wk15
#>   <dbl> <dbl> <dbl> <dbl> <dbl> <dbl>
#> 1    NA    NA    NA    NA    NA    NA
#> 2    NA    NA    NA    NA    NA    NA
```

```
#> 3    51    51    51    47    44    38
#> 4    61    61    59    61    66    72
#> # ... with 313 more rows
```

See Also

The [selection language](#) page, which includes links to other selection helpers.

where *Select variables with a function*

Description

This [selection helper](#) selects the variables for which a function returns TRUE.

Usage

```
where(fn)
```

Arguments

`fn` A function that returns TRUE or FALSE (technically, a *predicate* function). Can also be a purrr-like formula.

Examples

Selection helpers can be used in functions like `dplyr::select()` or `tidyr::pivot_longer()`. Let's first attach the tidyverse:

```
library(tidyverse)

# For better printing
iris <- as_tibble(iris)
```

`where()` takes a function and returns all variables for which the function returns TRUE:

```
is.factor(iris[[4]])
#> [1] FALSE

is.factor(iris[[5]])
#> [1] TRUE

iris %>% select(where(is.factor))
#> # A tibble: 150 x 1
#>   Species
#>   <fct>
#> 1 setosa
#> 2 setosa
```

```

#> 3 setosa
#> 4 setosa
#> # ... with 146 more rows

is.numeric(iris[[4]])
#> [1] TRUE

is.numeric(iris[[5]])
#> [1] FALSE

iris %>% select(where(is.numeric))
#> # A tibble: 150 x 4
#>   Sepal.Length Sepal.Width Petal.Length Petal.Width
#>   <dbl>         <dbl>         <dbl>         <dbl>
#> 1         5.1         3.5           1.4           0.2
#> 2         4.9         3             1.4           0.2
#> 3         4.7         3.2           1.3           0.2
#> 4         4.6         3.1           1.5           0.2
#> # ... with 146 more rows

```

The formula shorthand:

You can use purrr-like formulas as a shortcut for creating a function on the spot. These expressions are equivalent:

```

iris %>% select(where(is.numeric))
#> # A tibble: 150 x 4
#>   Sepal.Length Sepal.Width Petal.Length Petal.Width
#>   <dbl>         <dbl>         <dbl>         <dbl>
#> 1         5.1         3.5           1.4           0.2
#> 2         4.9         3             1.4           0.2
#> 3         4.7         3.2           1.3           0.2
#> 4         4.6         3.1           1.5           0.2
#> # ... with 146 more rows

```

```

iris %>% select(where(function(x) is.numeric(x)))
#> # A tibble: 150 x 4
#>   Sepal.Length Sepal.Width Petal.Length Petal.Width
#>   <dbl>         <dbl>         <dbl>         <dbl>
#> 1         5.1         3.5           1.4           0.2
#> 2         4.9         3             1.4           0.2
#> 3         4.7         3.2           1.3           0.2
#> 4         4.6         3.1           1.5           0.2
#> # ... with 146 more rows

```

```

iris %>% select(where(~ is.numeric(.x)))
#> # A tibble: 150 x 4
#>   Sepal.Length Sepal.Width Petal.Length Petal.Width
#>   <dbl>         <dbl>         <dbl>         <dbl>
#> 1         5.1         3.5           1.4           0.2

```

```
#> 2      4.9      3      1.4      0.2
#> 3      4.7      3.2    1.3      0.2
#> 4      4.6      3.1    1.5      0.2
#> # ... with 146 more rows
```

The shorthand is useful for adding logic inline. Here we select all numeric variables whose mean is greater than 3.5:

```
iris %>% select(where(~ is.numeric(.x) && mean(.x) > 3.5))
#> # A tibble: 150 x 2
#>   Sepal.Length Petal.Length
#>   <dbl>         <dbl>
#> 1     5.1         1.4
#> 2     4.9         1.4
#> 3     4.7         1.3
#> 4     4.6         1.5
#> # ... with 146 more rows
```

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