

# Package ‘keyholder’

November 13, 2017

**Title** Store Data About Rows

**Version** 0.1.1

**Description** Tools for keeping track of information, named “keys”, about rows of data frame like objects. This is done by creating special attribute “keys” which is updated after every change in rows (subsetting, ordering, etc.). This package is designed to work tightly with ‘dplyr’ package.

**Depends** R (>= 3.4.0)

**License** MIT + file LICENSE

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<https://github.com/echasnovski/keyholder/>

**BugReports** <https://github.com/echasnovski/keyholder/issues/>

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keyholder-package	<i>keyholder: Store Data About Rows</i>
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## Description

keyholder offers a set of tools for storing information about rows of data frame like objects. The common use cases are:

- Track rows of data frame without changing it.
- Store columns for future restoring in data frame.
- Hide columns for convenient use of `dplyr`'s `*_if` scoped variants of verbs.

## Details

To learn more about keyholder:

- Browse vignettes with `browseVignettes(package = "keyholder")`.
- Look how to [set keys](#).
- Look at the list of [supported functions](#).

## Author(s)

**Maintainer:** Evgeni Chasnovski <evgeni.chasnovski@gmail.com>

## See Also

Useful links:

- <https://echasnovski.github.io/keyholder/>
- <https://github.com/echasnovski/keyholder/>
- Report bugs at <https://github.com/echasnovski/keyholder/issues/>

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key-by-scoped	<i>Key by selection of variables</i>
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## Description

These functions perform keying by selection of variables using corresponding [scoped variant](#) of [select](#). Appropriate data frame is selected with scoped function first, and then it is assigned as keys.

## Usage

```
key_by_all(.tbl, .funs = list(), ..., .add = FALSE, .exclude = FALSE)
```

```
key_by_if(.tbl, .predicate, .funs = list(), ..., .add = FALSE,  
.exclude = FALSE)
```

```
key_by_at(.tbl, .vars, .funs = list(), ..., .add = FALSE,  
.exclude = FALSE)
```

## Arguments

<code>.tbl</code>	Reference data frame .
<code>.funs</code>	Parameter for <a href="#">scoped</a> functions.
<code>...</code>	Parameter for <a href="#">scoped</a> functions.
<code>.add</code>	Whether to add keys to (possibly) existing ones. If FALSE keys will be overridden.
<code>.exclude</code>	Whether to exclude key variables from <code>.tbl</code> .
<code>.predicate</code>	Parameter for <a href="#">scoped</a> functions.
<code>.vars</code>	Parameter for <a href="#">scoped</a> functions.

## See Also

[Not scoped key\\_by\(\)](#)

## Examples

```
mtcars %>% key_by_all(.funs = toupper)
```

```
mtcars %>% key_by_if(rlang::is_integerish, toupper)
```

```
mtcars %>% key_by_at(c("vs", "am"), toupper)
```

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keyed-df	<i>Keyed object</i>
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### Description

Utility functions for keyed objects which are implemented with class `keyed_df`. Keyed object should be a data frame which inherits from `keyed_df` and contains a data frame of `keys` in attribute `'keys'`.

### Usage

```
is_keyed_df(.tbl)

is.keyed_df(.tbl)

## S3 method for class 'keyed_df'
print(x, ...)

## S3 method for class 'keyed_df'
x[i, j, ...]
```

### Arguments

<code>.tbl</code>	Object to check.
<code>x</code>	Object to print or extract elements.
<code>...</code>	Further arguments passed to or from other methods.
<code>i, j</code>	Arguments for <code>[]</code> .

### Examples

```
is_keyed_df(mtcars)

mtcars %>% key_by(vs) %>% is_keyed_df

# Not valid keyed_df
df <- mtcars
class(df) <- c("keyed_df", "data.frame")
is_keyed_df(df)
```

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keyed-df-one-tbl	<i>One-table verbs from dplyr for keyed_df</i>
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## Description

Defined methods for [dplyr](#) generic single table functions. Most of them preserve 'keyed\_df' class and 'keys' attribute (excluding summarise with scoped variants, distinct and do which remove them). Also these methods modify rows in keys according to the rows modification in reference data frame (if any).

## Usage

```
## S3 method for class 'keyed_df'  
select(.tbl, ...)  
  
## S3 method for class 'keyed_df'  
rename(.tbl, ...)  
  
## S3 method for class 'keyed_df'  
mutate(.tbl, ...)  
  
## S3 method for class 'keyed_df'  
summarise(.tbl, ...)  
  
## S3 method for class 'keyed_df'  
group_by(.tbl, ..., add = FALSE)  
  
## S3 method for class 'keyed_df'  
ungroup(.tbl, ...)  
  
rowwise.keyed_df(.tbl)  
  
## S3 method for class 'keyed_df'  
distinct(.tbl, ..., .keep_all = FALSE)  
  
## S3 method for class 'keyed_df'  
do(.tbl, ...)  
  
## S3 method for class 'keyed_df'  
arrange(.tbl, ..., .by_group = FALSE)  
  
## S3 method for class 'keyed_df'  
filter(.data, ...)  
  
## S3 method for class 'keyed_df'  
slice(.tbl, ...)
```

**Arguments**

<code>.tbl, .data</code>	A keyed object.
<code>...</code>	Appropriate arguments for functions.
<code>add</code>	Parameter for <code>dplyr::group_by</code> .
<code>.keep_all</code>	Parameter for <code>dplyr::distinct</code> .
<code>.by_group</code>	Parameter for <code>dplyr::arrange</code> .

**Details**

`dplyr::transmute()` is supported implicitly with `dplyr::mutate()` support.

`dplyr::rowwise()` is not supposed to be generic in `dplyr`. Use `rowwise.keyed_df` directly.

All `scoped` variants of present functions are also supported.

**See Also**

[Two-table verbs](#)

**Examples**

```
mtcars %>% key_by(vs, am) %>% dplyr::mutate(gear = 1)
```

---

keyed-df-two-tbl

*Two-table verbs from dplyr for keyed\_df*

---

**Description**

Defined methods for `dplyr` generic `join` functions. All of them preserve 'keyed\_df' class and 'keys' attribute **of the first argument**. Also these methods modify rows in keys according to the rows modification in first argument (if any).

**Usage**

```
## S3 method for class 'keyed_df'
inner_join(x, y, by = NULL, copy = FALSE,
  suffix = c(".x", ".y"), ...)
```

```
## S3 method for class 'keyed_df'
left_join(x, y, by = NULL, copy = FALSE,
  suffix = c(".x", ".y"), ...)
```

```
## S3 method for class 'keyed_df'
right_join(x, y, by = NULL, copy = FALSE,
  suffix = c(".x", ".y"), ...)
```

```
## S3 method for class 'keyed_df'
full_join(x, y, by = NULL, copy = FALSE,
  suffix = c(".x", ".y"), ...)

## S3 method for class 'keyed_df'
semi_join(x, y, by = NULL, copy = FALSE, ...)

## S3 method for class 'keyed_df'
anti_join(x, y, by = NULL, copy = FALSE, ...)
```

### Arguments

`x`, `y`, `by`, `copy`, `suffix`, ...  
Parameters for [join](#) functions.

### See Also

[One-table verbs](#)

### Examples

```
dplyr::band_members %>% key_by(band) %>%
  dplyr::semi_join(dplyr::band_instruments, by = "name") %>%
  keys()
```

---

keyholder-id	<i>Add id column and key</i>
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---

### Description

Functions for creating id column and key.

### Usage

```
use_id(.tbl)

compute_id_name(x)

add_id(.tbl)

key_by_id(.tbl, .add = FALSE, .exclude = FALSE)
```

### Arguments

`.tbl` Reference data frame.  
`x` Character vector of names.  
`.add`, `.exclude` Parameters for [key\\_by\(\)](#).

## Details

`use_id()` [assigns](#) as keys a tibble with column `'id'` and row numbers of `.tbl` as values.

`compute_id_name()` computes the name which is different from every element in `x` by the following algorithm: if `'id'` is not present in `x` it is returned; if taken - `'id1'` is checked; if taken - `'id11'` is checked and so on.

`add_id()` creates a column with unique name (computed with `compute_id_name()`) and row numbers as values (grouping is ignored). After that puts it as first column.

`key_by_id()` is similar to `add_id()`: it creates a column with unique name and row numbers as values (grouping is ignored) and calls `key_by()` function to use this column as key. If `.add` is `FALSE` unique name is computed based on `.tbl` column names; if `TRUE` then based on `.tbl` and its keys column names.

## Examples

```
mtcars %>% use_id()

mtcars %>% add_id()

mtcars %>% key_by_id(.exclude = TRUE)
```

---

keyholder-scoped      *Operate on a selection of keys*

---

## Description

`keyholder` offers [scoped](#) variants of the following functions:

- [key\\_by\(\)](#). See [key\\_by\\_all\(\)](#).
- [remove\\_keys\(\)](#). See [remove\\_keys\\_all\(\)](#).
- [restore\\_keys\(\)](#). See [restore\\_keys\\_all\(\)](#).
- [rename\\_keys\(\)](#). See [rename\\_keys\\_all\(\)](#).

## Arguments

<code>.funs</code>	Parameter for <a href="#">scoped</a> functions.
<code>.vars</code>	Parameter for <a href="#">scoped</a> functions.
<code>.predicate</code>	Parameter for <a href="#">scoped</a> functions.
<code>...</code>	Parameter for <a href="#">scoped</a> functions.

## See Also

[Not scoped manipulation functions](#)

[Not scoped key\\_by\(\)](#)



---

keyholder-supported-funs

*Supported functions*

---

### Description

keyholder supports the following functions:

- Base subsetting with `[`.
- dplyr [one table verbs](#).
- dplyr [two table verbs](#).

---

keys-get

*Get keys*

---

### Description

Functions for getting information about keys.

### Usage

```
keys(.tbl)
```

```
raw_keys(.tbl)
```

```
has_keys(.tbl)
```

### Arguments

`.tbl` Reference data frame.

### Value

`keys()` always returns a [tibble](#) of keys. In case of no keys it returns a tibble with number of rows as in `.tbl` and zero columns. `raw_keys()` is just a wrapper for `attr(.tbl, "keys")`. To know whether `.tbl` has keys use `has_keys()`.

### See Also

[Set keys](#), [Manipulate keys](#)

**Examples**

```

keys(mtcars)

raw_keys(mtcars)

has_keys(mtcars)

df <- key_by(mtcars, vs, am)
keys(df)

has_keys(df)

```

---

keys-manipulate      *Manipulate keys*

---

**Description**

Functions to manipulate [keys](#).

**Usage**

```

remove_keys(.tbl, ..., .unkey = FALSE)

restore_keys(.tbl, ..., .remove = FALSE, .unkey = FALSE)

pull_key(.tbl, var)

rename_keys(.tbl, ...)

```

**Arguments**

<code>.tbl</code>	Reference data frame.
<code>...</code>	Variables to be used for operations defined in similar fashion as in <code>dplyr::select()</code> .
<code>.unkey</code>	Whether to <code>unkey()</code> <code>.tbl</code> in case there are no keys left.
<code>.remove</code>	Whether to remove keys after restoring.
<code>var</code>	Parameter for <code>dplyr::pull()</code> .

**Details**

`remove_keys()` removes keys defined with `...`

`restore_keys()` transfers keys defined with `...` into `.tbl` and removes them from keys if `.remove == TRUE`. If `.tbl` is grouped the following happens:

- If restored keys don't contain grouping variables then groups don't change;

- If restored keys contain grouping variables then result will be regrouped based on restored values. In other words restoring keys beats 'not-modifying' grouping variables rule. It is made according to the ideology of keys: they contain information about rows and by restoring you want it to be available.

`pull_key()` extracts one specified column from keys with `dplyr::pull()`.

`rename_keys()` renames columns in keys using `dplyr::rename()`.

### See Also

[Get keys](#), [Set keys](#)

[Scoped functions](#)

### Examples

```
df <- mtcars %>% dplyr::as_tibble() %>%
  key_by(vs, am, .exclude = TRUE)
df %>% remove_keys(vs)

df %>% remove_keys(dplyr::everything())

df %>% remove_keys(dplyr::everything(), .unkey = TRUE)

df %>% restore_keys(vs)

df %>% restore_keys(vs, .remove = TRUE)

df %>% restore_keys(dplyr::everything(), .remove = TRUE)

df %>% restore_keys(dplyr::everything(), .remove = TRUE, .unkey = TRUE)

# Restoring on grouped data frame
df_grouped <- df %>% dplyr::mutate(vs = 1) %>% dplyr::group_by(vs)
df_grouped %>% restore_keys(dplyr::everything())

# Pulling
df %>% pull_key(vs)

# Renaming
df %>% rename_keys(Vs = vs)
```

**Description**

Key is a vector which goal is to provide information about rows in reference data frame. Its length should always be equal to number of rows in data frame. Keys are stored as [tibble](#) in attribute "keys" and so one data frame can have multiple keys. Data frame with keys is implemented as class [keyed\\_df](#).

**Usage**

```
keys(.tbl) <- value

assign_keys(.tbl, value)

key_by(.tbl, ..., .add = FALSE, .exclude = FALSE)

unkey(.tbl)
```

**Arguments**

<code>.tbl</code>	Reference data frame .
<code>value</code>	Values of keys (converted to <a href="#">tibble</a> ).
<code>...</code>	Variables to be used as keys defined in similar fashion as in <a href="#">dplyr::select()</a> .
<code>.add</code>	Whether to add keys to (possibly) existing ones. If FALSE keys will be overridden.
<code>.exclude</code>	Whether to exclude key variables from <code>.tbl</code> .

**Details**

`key_by` ignores grouping when creating keys. Also if `.add == TRUE` and names of some added keys match the names of existing keys the new ones will override the old ones.

Value for `keys<-` should not be NULL because it is converted to tibble with zero rows. To remove keys use `unkey()`, [remove\\_keys\(\)](#) or [restore\\_keys\(\)](#). `assign_keys` is a more suitable for piping wrapper for `keys<-`.

**See Also**

[Get keys, Manipulate keys](#)  
[Scoped key\\_by\(\)](#)

**Examples**

```
df <- dplyr::as_tibble(mtcars)

# Value is converted to tibble
keys(df) <- 1:nrow(df)

# This will throw an error
## Not run:
keys(df) <- 1:10
```

```
## End(Not run)

# Use 'vs' and 'am' as keys
df %>% key_by(vs, am)

df %>% key_by(vs, am, .exclude = TRUE)

df %>% key_by(vs) %>% key_by(am, .add = TRUE, .exclude = TRUE)

# Override keys
df %>% key_by(vs, am) %>% dplyr::mutate(vs = 1) %>%
  key_by(gear, vs, .add = TRUE)

# Use select helpers
df %>% key_by(dplyr::one_of(c("vs", "am")))

df %>% key_by(dplyr::everything())
```

---

remove-keys-scoped      *Remove selection of keys*

---

## Description

These functions remove selection of keys using corresponding [scoped variant](#) of `select`. `.funs` argument is removed because of its redundancy.

## Usage

```
remove_keys_all(.tbl, ..., .unkey = FALSE)

remove_keys_if(.tbl, .predicate, ..., .unkey = FALSE)

remove_keys_at(.tbl, .vars, ..., .unkey = FALSE)
```

## Arguments

<code>.tbl</code>	Reference data frame.
<code>...</code>	Parameter for <a href="#">scoped</a> functions.
<code>.unkey</code>	Whether to <a href="#">unkey()</a> <code>.tbl</code> in case there are no keys left.
<code>.predicate</code>	Parameter for <a href="#">scoped</a> functions.
<code>.vars</code>	Parameter for <a href="#">scoped</a> functions.

**Examples**

```
df <- mtcars %>% dplyr::as_tibble() %>% key_by(vs, am, disp)
df %>% remove_keys_all()

df %>% remove_keys_all(.unkey = TRUE)

df %>% remove_keys_if(rlang::is_integerish)

df %>% remove_keys_at(c("vs", "am"))
```

---

rename-keys-scoped      *Rename selection of keys*

---

**Description**

These functions rename selection of keys using corresponding [scoped variant](#) of [rename](#).

**Usage**

```
rename_keys_all(.tbl, .funs = list(), ...)
rename_keys_if(.tbl, .predicate, .funs = list(), ...)
rename_keys_at(.tbl, .vars, .funs = list(), ...)
```

**Arguments**

<code>.tbl</code>	Reference data frame.
<code>.funs</code>	Parameter for <a href="#">scoped</a> functions.
<code>...</code>	Parameter for <a href="#">scoped</a> functions.
<code>.predicate</code>	Parameter for <a href="#">scoped</a> functions.
<code>.vars</code>	Parameter for <a href="#">scoped</a> functions.

---

restore-keys-scoped      *Restore selection of keys*

---

**Description**

These functions restore selection of keys using corresponding [scoped variant](#) of [select](#). `.funs` argument can be used to rename some keys (without touching actual keys) before restoring.

**Usage**

```
restore_keys_all(.tbl, .funs = list(), ..., .remove = FALSE,
  .unkey = FALSE)

restore_keys_if(.tbl, .predicate, .funs = list(), ..., .remove = FALSE,
  .unkey = FALSE)

restore_keys_at(.tbl, .vars, .funs = list(), ..., .remove = FALSE,
  .unkey = FALSE)
```

**Arguments**

<code>.tbl</code>	Reference data frame.
<code>.funs</code>	Parameter for <a href="#">scoped</a> functions.
<code>...</code>	Parameter for <a href="#">scoped</a> functions.
<code>.remove</code>	Whether to remove keys after restoring.
<code>.unkey</code>	Whether to <a href="#">unkey()</a> <code>.tbl</code> in case there are no keys left.
<code>.predicate</code>	Parameter for <a href="#">scoped</a> functions.
<code>.vars</code>	Parameter for <a href="#">scoped</a> functions.

**Examples**

```
df <- mtcars %>% dplyr::as_tibble() %>% key_by(vs, am, disp)
# Just restore all keys
df %>% restore_keys_all()

# Restore all keys with renaming and without touching actual keys
df %>% restore_keys_all(.funs = toupper)

# Restore with renaming and removing
df %>%
  restore_keys_all(.funs = toupper, .remove = TRUE)

# Restore with renaming, removing and unkeying
df %>%
  restore_keys_all(.funs = toupper, .remove = TRUE, .unkey = TRUE)

# Restore with renaming keys satisfying the predicate
df %>%
  restore_keys_if(rlang::is_integerish, .funs = toupper)

# Restore with renaming specified keys
df %>%
  restore_keys_at(c("vs", "disp"), .funs = toupper)
```

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