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Maintainer John Mount <jmount@win-vector.com>

BugReports <https://github.com/WinVector/cdata/issues>

Description Supplies higher-order coordinatized data specification and fluid transform operators that include pivot and anti-pivot as special cases. The methodology is describe in 'Zumel', 2018, ``Fluid data reshaping with 'cdata'', <<https://winvector.github.io/FluidData/FluidDataReshapingWithCdata.html>>, <[DOI:10.5281/zenodo.1173299](https://doi.org/10.5281/zenodo.1173299)>. This package introduces the idea of explicit control table specification of data transforms. Works on in-memory data or on remote data using 'rquery' and 'SQL' database interfaces.

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cdata-package	cdata: <i>Fluid Data Transformations.</i>
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Description

Supplies implementations of higher order "fluid data" transforms. These transforms move data between rows and columns, are controlled by a graphical transformation specification, and have pivot and un-pivot as special cases. Large scale implementation is based on 'rquery', so should be usable on 'SQL' compliant data sources (include large systems such as 'PostgreSQL' and 'Spark'). This package introduces the idea of control table specification of data transforms (later aslo adapted from 'cdata' by 'tidyr'). A theory of fluid data transforms can be found in the following articles: <https://winvector.github.io/FluidData/FluidDataReshapingWithCdata.html>, <https://github.com/WinVector/cdata> and <https://winvector.github.io/FluidData/FluidData.html>.

Author(s)

Maintainer: John Mount <jmount@win-vector.com>

Authors:

- Nina Zumel <nzumel@win-vector.com>

Other contributors:

- Win-Vector LLC [copyright holder]

See Also

Useful links:

- <https://github.com/WinVector/cdata/>
- <https://winvector.github.io/cdata/>
- Report bugs at <https://github.com/WinVector/cdata/issues>

blocks_to_rowrecs *Map data records from block records to row records.*

Description

Map data records from block records (which each record may be more than one row) to row records (where each record is a single row).

Usage

```
blocks_to_rowrecs(  
  tallTable,  
  keyColumns,  
  controlTable,  
  ...,  
  columnsToCopy = NULL,  
  checkNames = TRUE,  
  checkKeys = TRUE,  
  strict = FALSE,  
  controlTableKeys = colnames(controlTable)[[1]],  
  tmp_name_source = wrapr::mk_tmp_name_source("bltrr"),  
  temporary = TRUE,  
  allow_rqdatatable = FALSE  
)
```

Default S3 method:

```
blocks_to_rowrecs(  
  tallTable,  
  keyColumns,  
  controlTable,  
  ...,  
  columnsToCopy = NULL,  
  checkNames = TRUE,  
  checkKeys = FALSE,  
  strict = FALSE,  
  controlTableKeys = colnames(controlTable)[[1]],  
  tmp_name_source = wrapr::mk_tmp_name_source("btrd"),  
  temporary = TRUE,  
  allow_rqdatatable = FALSE
```

```

)

## S3 method for class 'relop'
blocks_to_rowrecs(
  tallTable,
  keyColumns,
  controlTable,
  ...,
  columnsToCopy = NULL,
  checkNames = TRUE,
  checkKeys = FALSE,
  strict = FALSE,
  controlTableKeys = colnames(controlTable)[[1]],
  tmp_name_source = wrapr::mk_tmp_name_source("bltrr"),
  temporary = TRUE,
  allow_rqdatatable = FALSE
)

```

Arguments

tallTable	data.frame containing data to be mapped (in-memory data.frame).
keyColumns	character vector of column defining row groups
controlTable	table specifying mapping (local data frame)
...	force later arguments to be by name.
columnsToCopy	character, extra columns to copy.
checkNames	logical, if TRUE check names.
checkKeys	logical, if TRUE check keyColumns uniquely identify blocks (required).
strict	logical, if TRUE check control table name forms
controlTableKeys	character, which column names of the control table are considered to be keys.
tmp_name_source	a tempNameGenerator from cdata::mk_tmp_name_source()
temporary	logical, if TRUE use temporary tables
allow_rqdatatable	logical, if TRUE allow rqdatatable shortcutting on simple conversions.

Details

The controlTable defines the names of each data element in the two notations: the notation of the tall table (which is row oriented) and the notation of the wide table (which is column oriented). controlTable[, 1] (the group label) cross colnames(controlTable) (the column labels) are names of data cells in the long form. controlTable[, 2:ncol(controlTable)] (column labels) are names of data cells in the wide form. To get behavior similar to tidyr::gather/spread one builds the control table by running an appropriate query over the data.

Some discussion and examples can be found here: <https://winvector.github.io/FluidData/FluidData.html> and here <https://github.com/WinVector/cdata>.

Value

wide table built by mapping key-grouped tallTable rows to one row per group

See Also

[build_pivot_control](#), [rowrecs_to_blocks](#)

Examples

```
# pivot example
d <- data.frame(meas = c('AUC', 'R2'),
               val = c(0.6, 0.2))

cT <- build_pivot_control(d,
                        columnToTakeKeysFrom= 'meas',
                        columnToTakeValuesFrom= 'val')

blocks_to_rowrecs(d,
                 keyColumns = NULL,
                 controlTable = cT)

d <- data.frame(meas = c('AUC', 'R2'),
               val = c(0.6, 0.2))
cT <- build_pivot_control(
  d,
  columnToTakeKeysFrom= 'meas',
  columnToTakeValuesFrom= 'val')

ops <- rquery::local_td(d) %>%
  blocks_to_rowrecs(.,
                  keyColumns = NULL,
                  controlTable = cT)

cat(format(ops))

if(requireNamespace("rqdatatable", quietly = TRUE)) {
  library("rqdatatable")
  d %>%
    ops %>%
    print(.)
}

if(requireNamespace("RSQLite", quietly = TRUE)) {
  db <- DBI::dbConnect(RSQLite::SQLite(), ":memory:")
  DBI::dbWriteTable(db,
                  'd',
                  d,
                  overwrite = TRUE,
                  temporary = TRUE)

  db %>%
    ops %>%
    print(.)
  DBI::dbDisconnect(db)
}
```

```
}

```

```
blocks_to_rowrecs_spec
```

Create a block records to row records transform specification.

Description

Create a block records to row records transform specification object that holds the pivot control table, specification of extra row keys, and control table keys.

Usage

```
blocks_to_rowrecs_spec(
  controlTable,
  ...,
  recordKeys = character(0),
  controlTableKeys = colnames(controlTable)[[1]],
  checkNames = TRUE,
  checkKeys = TRUE,
  strict = FALSE,
  allow_rqdatatable = FALSE
)
```

Arguments

controlTable	an all character data frame or cdata pivot control.
...	not used, force later arguments to bind by name.
recordKeys	vector of columns identifying records.
controlTableKeys	vector of keying columns of the controlTable.
checkNames	passed to blocks_to_rowrecs.
checkKeys	passed to blocks_to_rowrecs.
strict	passed to blocks_to_rowrecs.
allow_rqdatatable	logical, if TRUE allow rqdatatable shortcutting on simple conversions.

Value

a record specification object

Examples

```
d <- wrapr::build_frame(
  "id", "measure", "value" |
  1 , "AUC" , 0.7 |
  1 , "R2" , 0.4 |
  2 , "AUC" , 0.8 |
  2 , "R2" , 0.5 )

transform <- blocks_to_rowrecs_spec(
  wrapr::qchar_frame(
    "measure", "value" |
    "AUC" , AUC |
    "R2" , R2 ),
  recordKeys = "id")

print(transform)

d %>% transform

inv_transform <- t(transform)
print(inv_transform)

# identity (in structure)
d %>% transform %>% inv_transform

# identity again (using .() "immediate" notation)
d %>% transform %>% .(t(transform))
```

`build_pivot_control` *Build a `blocks_to_rowrecs()/rowrecs_to_blocks()` control table that specifies a pivot from a data.frame.*

Description

Some discussion and examples can be found here: <https://winvector.github.io/FluidData/FluidData.html>.

Usage

```
build_pivot_control(
  table,
  columnToTakeKeysFrom,
  columnToTakeValuesFrom,
  ...,
  prefix = columnToTakeKeysFrom,
  sep = NULL,
  tmp_name_source = wrapr::mk_tmp_name_source("bpc"),
```

```

    temporary = FALSE
  )

## Default S3 method:
build_pivot_control(
  table,
  columnToTakeKeysFrom,
  columnToTakeValuesFrom,
  ...,
  prefix = columnToTakeKeysFrom,
  sep = NULL,
  tmp_name_source = wrapr::mk_tmp_name_source("bpcd"),
  temporary = TRUE
)

## S3 method for class 'relop'
build_pivot_control(
  table,
  columnToTakeKeysFrom,
  columnToTakeValuesFrom,
  ...,
  prefix = columnToTakeKeysFrom,
  sep = NULL,
  tmp_name_source = wrapr::mk_tmp_name_source("bpc"),
  temporary = FALSE
)

```

Arguments

table	data.frame to scan for new column names (in-memory data.frame).
columnToTakeKeysFrom	character name of column build new column names from.
columnToTakeValuesFrom	character name of column to get values from.
...	not used, force later args to be by name
prefix	column name prefix (only used when sep is not NULL)
sep	separator to build complex column names.
tmp_name_source	a tempNameGenerator from cdata::mk_tmp_name_source()
temporary	logical, if TRUE use temporary tables

Value

control table

See Also

[blocks_to_rowrecs](#)

Examples

```

d <- data.frame(measType = c("wt", "ht"),
               measValue = c(150, 6),
               stringsAsFactors = FALSE)
build_pivot_control(d,
                   'measType', 'measValue',
                   sep = '_')

d <- data.frame(measType = c("wt", "ht"),
               measValue = c(150, 6),
               stringsAsFactors = FALSE)

ops <- rquery::local_td(d) %.>%
  build_pivot_control(.,
                    'measType', 'measValue',
                    sep = '_')

cat(format(ops))

if(requireNamespace("rqdatatable", quietly = TRUE)) {
  library("rqdatatable")
  d %.>%
    ops %.>%
    print(.)
}

if(requireNamespace("RSQLite", quietly = TRUE)) {
  db <- DBI::dbConnect(RSQLite::SQLite(), ":memory:")
  DBI::dbWriteTable(db,
                   'd',
                   d,
                   overwrite = TRUE,
                   temporary = TRUE)

  db %.>%
    ops %.>%
    print(.)
  DBI::dbDisconnect(db)
}

```

build_unpivot_control *Build a rowrecs_to_blocks() control table that specifies a un-pivot (or "shred").*

Description

Some discussion and examples can be found here: <https://winvector.github.io/FluidData/FluidData.html> and here <https://github.com/WinVector/cdata>.

Usage

```
build_unpivot_control(
  nameForNewKeyColumn,
  nameForNewValueColumn,
  columnsToTakeFrom,
  ...
)
```

Arguments

nameForNewKeyColumn
character name of column to write new keys in.

nameForNewValueColumn
character name of column to write new values in.

columnsToTakeFrom
character array names of columns to take values from.

...
not used, force later args to be by name

Value

control table

See Also

[rowrecs_to_blocks](#)

Examples

```
build_unpivot_control("measurementType", "measurementValue", c("c1", "c2"))
```

```
convert_cdata_spec_to_yaml
```

Convert a layout_specification, blocks_to_rowrecs_spec, or rowrecs_to_blocks_spec to a simple object.

Description

Convert a layout_specification, blocks_to_rowrecs_spec, or rowrecs_to_blocks_spec to a simple object.

Usage

```
convert_cdata_spec_to_yaml(spec)
```

Arguments

spec a layout_specification, blocks_to_rowrecs_spec, or rowrecs_to_blocks_spec

Value

a simple object suitable for YAML serialization

convert_records	<i>General transform from arbitrary record shape to arbitrary record shape.</i>
-----------------	---

Description

General transform from arbitrary record shape to arbitrary record shape.

Usage

```
convert_records(
  table,
  incoming_shape = NULL,
  outgoing_shape = NULL,
  ...,
  keyColumns = NULL,
  columnsToCopy_in = NULL,
  checkNames = TRUE,
  checkKeys = FALSE,
  strict = FALSE,
  incoming_controlTableKeys = colnames(incoming_shape)[[1]],
  outgoing_controlTableKeys = colnames(outgoing_shape)[[1]],
  tmp_name_source = wrapr::mk_tmp_name_source("crec"),
  temporary = TRUE,
  allow_rqdatatable_in = FALSE,
  allow_rqdatatable_out = FALSE
)
```

Arguments

table	data.frame or relop.
incoming_shape	data.frame, definition of incoming record shape.
outgoing_shape	data.frame, definition of outgoing record shape.
...	force later arguments to bind by name.
keyColumns	character vector of column defining incoming row groups
columnsToCopy_in	character array of incoming column names to copy.
checkNames	logical, if TRUE check names.
checkKeys	logical, if TRUE check columnsToCopy form row keys (not a requirement, unless you want to be able to invert the operation).
strict	logical, if TRUE check control table name forms.

incoming_controlTableKeys
 character, which column names of the incoming control table are considered to be keys.

outgoing_controlTableKeys
 character, which column names of the outgoing control table are considered to be keys.

tmp_name_source
 a tempNameGenerator from cdata::mk_tmp_name_source()

temporary
 logical, if TRUE use temporary tables

allow_rqdatatable_in
 logical, if TRUE allow rqdatatable shortcutting on simple conversions.

allow_rqdatatable_out
 logical, if TRUE allow rqdatatable shortcutting on simple conversions.

Value

processing pipeline or transformed table

Examples

```
incoming_shape <- qchar_frame(
  "row", "col1", "col2", "col3" |
  "row1", v11, v12, v13 |
  "row2", v21, v22, v23 |
  "row3", v31, v32, v33 )

outgoing_shape <- qchar_frame(
  "column", "row1", "row2", "row3" |
  "col1", v11, v21, v31 |
  "col2", v12, v22, v32 |
  "col3", v13, v23, v33 )

data <- build_frame(
  'record_id', 'row', 'col1', 'col2', 'col3' |
  1, 'row1', 1, 2, 3 |
  1, 'row2', 4, 5, 6 |
  1, 'row3', 7, 8, 9 |
  2, 'row1', 11, 12, 13 |
  2, 'row2', 14, 15, 16 |
  2, 'row3', 17, 18, 19 )

print(data)

convert_records(
  data,
  keyColumns = 'record_id',
  incoming_shape = incoming_shape,
  outgoing_shape = outgoing_shape)
```

```
td <- rquery::local_td(data)

ops <- convert_records(
  td,
  keyColumns = 'record_id',
  incoming_shape = incoming_shape,
  outgoing_shape = outgoing_shape)

cat(format(ops))
```

convert_yaml_to_cdata_spec

Read a cdata record transform from a simple object (such as is imported from YAML).

Description

Read a cdata record transform from a simple object (such as is imported from YAML).

Usage

```
convert_yaml_to_cdata_spec(obj)
```

Arguments

obj object to convert

Value

cdata transform specification

layout_by

Use transform spec to layout data.

Description

Use transform spec to layout data.

Usage

```
layout_by(transform, table)
```

Arguments

transform object of class rowrecs_to_blocks_spec
 table data.frame or relop.

Value

re-arranged data or data reference (relop).

Examples

```
d <- wrapr::build_frame(
  "id" , "AUC", "R2" |
  1   , 0.7 , 0.4 |
  2   , 0.8 , 0.5 )
transform <- rowrecs_to_blocks_spec(
  wrapr::qchar_frame(
    "measure", "value" |
    "AUC"    , AUC    |
    "R2"     , R2     ),
  recordKeys = "id")
print(transform)
layout_by(transform, d)

d <- wrapr::build_frame(
  "id", "measure", "value" |
  1   , "AUC"    , 0.7    |
  1   , "R2"     , 0.4    |
  2   , "AUC"    , 0.8    |
  2   , "R2"     , 0.5    )
transform <- blocks_to_rowrecs_spec(
  wrapr::qchar_frame(
    "measure", "value" |
    "AUC"    , AUC    |
    "R2"     , R2     ),
  recordKeys = "id")
print(transform)
layout_by(transform, d)
```

layout_by.blocks_to_rowrecs_spec

Use transform spec to layout data.

Description

Use transform spec to layout data.

Usage

```
## S3 method for class 'blocks_to_rowrecs_spec'
layout_by(transform, table)
```

Arguments

transform object of class blocks_to_rowrecs_spec.
table data.frame or relop.

Value

re-arranged data or data reference (relop).

Examples

```
d <- wrapr::build_frame(
  "id", "measure", "value" |
  1 , "AUC" , 0.7 |
  1 , "R2" , 0.4 |
  2 , "AUC" , 0.8 |
  2 , "R2" , 0.5 )

transform <- blocks_to_rowrecs_spec(
  wrapr::qchar_frame(
    "measure", "value" |
    "AUC" , AUC |
    "R2" , R2 ),
  recordKeys = "id")

print(transform)

layout_by(transform, d)
```

layout_by.cdata_general_transform_spec

Use transform spec to layout data.

Description

Use transform spec to layout data.

Usage

```
## S3 method for class 'cdata_general_transform_spec'
layout_by(transform, table)
```

Arguments

transform object of class blocks_to_rowrecs_spec.
 table data.frame or relop.

Value

re-arranged data or data reference (relop).

layout_by.rowrecs_to_blocks_spec

Use transform spec to layout data.

Description

Use transform spec to layout data.

Usage

```
## S3 method for class 'rowrecs_to_blocks_spec'
layout_by(transform, table)
```

Arguments

transform object of class rowrecs_to_blocks_spec
 table data.frame or relop.

Value

re-arranged data or data reference (relop).

Examples

```
d <- wrapr::build_frame(
  "id" , "AUC", "R2" |
  1   , 0.7 , 0.4 |
  2   , 0.8 , 0.5 )

transform <- rowrecs_to_blocks_spec(
  wrapr::qchar_frame(
    "measure", "value" |
    "AUC"     , AUC    |
    "R2"      , R2     ),
  recordKeys = "id")

print(transform)
layout_by(transform, d)
```

layout_specification *Create a record to record spec.*

Description

Create a general record to record transform specification.

Usage

```
layout_specification(
  incoming_shape = NULL,
  outgoing_shape = NULL,
  ...,
  recordKeys = character(0),
  incoming_controlTableKeys = colnames(incoming_shape)[[1]],
  outgoing_controlTableKeys = colnames(outgoing_shape)[[1]],
  checkNames = TRUE,
  checkKeys = TRUE,
  strict = FALSE,
  allow_rqdatatable_in = FALSE,
  allow_rqdatatable_out = FALSE
)
```

Arguments

`incoming_shape` data.frame, definition of incoming record shape.

`outgoing_shape` data.frame, definition of outgoing record shape.

`...` not used, force later arguments to bind by name.

`recordKeys` vector of columns identifying records.

`incoming_controlTableKeys` character, which column names of the incoming control table are considered to be keys.

`outgoing_controlTableKeys` character, which column names of the outgoing control table are considered to be keys.

`checkNames` passed to `rowrecs_to_blocks`.

`checkKeys` passed to `rowrecs_to_blocks`.

`strict` passed to `rowrecs_to_blocks`.

`allow_rqdatatable_in` logical, if TRUE allow rqdatatable shortcutting on simple conversions.

`allow_rqdatatable_out` logical, if TRUE allow rqdatatable shortcutting on simple conversions.

Value

a record specification object

Examples

```
incoming_shape <- qchar_frame(
  "row", "col1", "col2", "col3" |
  "row1", v11, v12, v13 |
  "row2", v21, v22, v23 |
  "row3", v31, v32, v33 )

outgoing_shape <- qchar_frame(
  "column", "row1", "row2", "row3" |
  "col1", v11, v21, v31 |
  "col2", v12, v22, v32 |
  "col3", v13, v23, v33 )

data <- build_frame(
  'record_id', 'row', 'col1', 'col2', 'col3' |
  1, 'row1', 1, 2, 3 |
  1, 'row2', 4, 5, 6 |
  1, 'row3', 7, 8, 9 |
  2, 'row1', 11, 12, 13 |
  2, 'row2', 14, 15, 16 |
  2, 'row3', 17, 18, 19 )

print(data)

layout <- layout_specification(
  incoming_shape = incoming_shape,
  outgoing_shape = outgoing_shape,
  recordKeys = 'record_id')

print(layout)

data %>% layout

data %>% layout %>% .(t(layout))
```

map_fields

Map field values from one column into new derived columns (takes a data.frame).

Description

Map field values from one column into new derived columns (takes a data.frame).

Usage

```
map_fields(d, cname, m)
```

Arguments

d name of table to re-map.
cname name of column to re-map.
m name of table of data describing the mapping (cname column is source, derived columns are destinations).

Value

re-mapped table

Examples

```
d <- data.frame(what = c("acc", "loss",
                        "val_acc", "val_loss"),
               score = c(0.8, 1.2,
                        0.7, 1.7),
               stringsAsFactors = FALSE)
m <- data.frame(what = c("acc", "loss",
                        "val_acc", "val_loss"),
               measure = c("accuracy", "log-loss",
                          "accuracy", "log-loss"),
               dataset = c("train", "train", "validation", "validation"),
               stringsAsFactors = FALSE)
map_fields(d, 'what', m)
```

map_fields_q	<i>Map field values from one column into new derived columns (query based, takes name of table).</i>
--------------	--

Description

Map field values from one column into new derived columns (query based, takes name of table).

Usage

```
map_fields_q(
  dname,
  cname,
  mname,
  my_db,
  rname,
  ...,
```

```

    d_qualifiers = NULL,
    m_qualifiers = NULL
  )

```

Arguments

<code>dname</code>	name of table to re-map.
<code>cname</code>	name of column to re-map.
<code>mname</code>	name of table of data describing the mapping (cname column is source, derived columns are destinations).
<code>my_db</code>	database handle.
<code>rname</code>	name of result table.
<code>...</code>	force later arguments to be by name.
<code>d_qualifiers</code>	optional named ordered vector of strings carrying additional db hierarchy terms, such as schema.
<code>m_qualifiers</code>	optional named ordered vector of strings carrying additional db hierarchy terms, such as schema.

Value

re-mapped table

Examples

```

if (requireNamespace("DBI", quietly = TRUE) &&
    requireNamespace("RSQLite", quietly = TRUE)) {
  my_db <- DBI::dbConnect(RSQLite::SQLite(),
                          ":memory:")

  DBI::dbWriteTable(
    my_db,
    'd',
    data.frame(what = c("acc", "loss",
                       "val_acc", "val_loss"),
               score = c(0.8, 1.2,
                          0.7, 1.7),
               stringsAsFactors = FALSE),
    overwrite = TRUE,
    temporary = TRUE)
  DBI::dbWriteTable(
    my_db,
    'm',
    data.frame(what = c("acc", "loss",
                       "val_acc", "val_loss"),
               measure = c("accuracy", "log-loss",
                           "accuracy", "log-loss"),
               dataset = c("train", "train", "validation", "validation"),
               stringsAsFactors = FALSE),
    overwrite = TRUE,
    temporary = TRUE)

```

```

    map_fields_q('d', 'what', 'm', my_db, "dm")
    cdata::qlook(my_db, 'dm')
    DBI::dbDisconnect(my_db)
}

```

pivot_to_rowrecs	<i>Map data records from block records that have one row per measurement value to row records.</i>
------------------	--

Description

Map data records from block records (where each record may be more than one row) to row records (where each record is a single row). Values specified in `rowKeyColumns` determine which sets of rows build up records and are copied into the result.

Usage

```

pivot_to_rowrecs(
  data,
  columnToTakeKeysFrom,
  columnToTakeValuesFrom,
  rowKeyColumns,
  ...,
  sep = NULL,
  checkNames = TRUE,
  checkKeys = TRUE,
  strict = FALSE,
  allow_rqdatatable = FALSE
)

```

```

layout_to_rowrecs(
  data,
  columnToTakeKeysFrom,
  columnToTakeValuesFrom,
  rowKeyColumns,
  ...,
  sep = NULL,
  checkNames = TRUE,
  checkKeys = TRUE,
  strict = FALSE,
  allow_rqdatatable = FALSE
)

```

Arguments

data data.frame to work with (must be local, for remote please try `moveValuesToColumns*`).
columnToTakeKeysFrom character name of column build new column names from.
columnToTakeValuesFrom character name of column to get values from.
rowKeyColumns character array names columns that should be table keys.
... force later arguments to bind by name.
sep character if not null build more detailed column names.
checkNames logical, if TRUE check names.
checkKeys logical, if TRUE check `keyColumns` uniquely identify blocks (required).
strict logical, if TRUE check control table name forms
allow_rqdatatable logical, if TRUE allow `rqdatatable` shortcutting on simple conversions.

Value

new data.frame with values moved to columns.

See Also

[unpivot_to_blocks](#), [blocks_to_rowrecs](#)

Examples

```

d <- data.frame(model_id = c("m1", "m1"), meas = c('AUC', 'R2'), val= c(0.6, 0.2))
pivot_to_rowrecs(d,
  columnToTakeKeysFrom= 'meas',
  columnToTakeValuesFrom= 'val',
  rowKeyColumns= "model_id") %>%
  print(.)

```

rowrecs_to_blocks *Map a data records from row records to block records.*

Description

Map a data records from row records (records that are exactly single rows) to block records (records that may be more than one row).

Usage

```

rowrecs_to_blocks(
  wideTable,
  controlTable,
  ...,
  checkNames = TRUE,
  checkKeys = FALSE,
  strict = FALSE,
  controlTableKeys = colnames(controlTable)[[1]],
  columnsToCopy = NULL,
  tmp_name_source = wrapr::mk_tmp_name_source("rrtbl"),
  temporary = TRUE,
  allow_rqdatatable = FALSE
)

## Default S3 method:
rowrecs_to_blocks(
  wideTable,
  controlTable,
  ...,
  checkNames = TRUE,
  checkKeys = FALSE,
  strict = FALSE,
  controlTableKeys = colnames(controlTable)[[1]],
  columnsToCopy = NULL,
  tmp_name_source = wrapr::mk_tmp_name_source("rrtobd"),
  temporary = TRUE,
  allow_rqdatatable = FALSE
)

## S3 method for class 'relop'
rowrecs_to_blocks(
  wideTable,
  controlTable,
  ...,
  checkNames = TRUE,
  checkKeys = FALSE,
  strict = FALSE,
  controlTableKeys = colnames(controlTable)[[1]],
  columnsToCopy = NULL,
  tmp_name_source = wrapr::mk_tmp_name_source("rrtbl"),
  temporary = TRUE,
  allow_rqdatatable = FALSE
)

```

Arguments

`wideTable` `data.frame` containing data to be mapped (in-memory `data.frame`).

controlTable	table specifying mapping (local data frame).
...	force later arguments to be by name.
checkNames	logical, if TRUE check names.
checkKeys	logical, if TRUE check columnsToCopy form row keys (not a requirement, unless you want to be able to invert the operation).
strict	logical, if TRUE check control table name forms.
controlTableKeys	character, which column names of the control table are considered to be keys.
columnsToCopy	character array of column names to copy.
tmp_name_source	a tempNameGenerator from cdata::mk_tmp_name_source()
temporary	logical, if TRUE use temporary tables
allow_rqdatatable	logical, if TRUE allow rqdatatable shortcutting on simple conversions.

Details

The controlTable defines the names of each data element in the two notations: the notation of the tall table (which is row oriented) and the notation of the wide table (which is column oriented). controlTable[, 1] (the group label) cross colnames(controlTable) (the column labels) are names of data cells in the long form. controlTable[, 2:ncol(controlTable)] (column labels) are names of data cells in the wide form. To get behavior similar to tidyr::gather/spread one builds the control table by running an appropriate query over the data.

Some discussion and examples can be found here: <https://winvector.github.io/FluidData/FluidData.html> and here <https://github.com/WinVector/cdata>.

rowrecs_to_blocks.default will change some factor columns to character, and there are issues with time columns with different time zones.

Value

long table built by mapping wideTable to one row per group

See Also

[build_unpivot_control](#), [blocks_to_rowrecs](#)

Examples

```
# un-pivot example
d <- data.frame(AUC = 0.6, R2 = 0.2)
cT <- build_unpivot_control(nameForNewKeyColumn= 'meas',
                           nameForNewValueColumn= 'val',
                           columnsToTakeFrom= c('AUC', 'R2'))
rowrecs_to_blocks(d, cT)
```



```

d <- data.frame(AUC = 0.6, R2 = 0.2)
cT <- build_unpivot_control(
  nameForNewKeyColumn= 'meas',
  nameForNewValueColumn= 'val',
  columnsToTakeFrom= c('AUC', 'R2'))

ops <- rquery::local_td(d) %.>%
  rowrecs_to_blocks(., cT)
cat(format(ops))

if(requireNamespace("rdatatable", quietly = TRUE)) {
  library("rdatatable")
  d %.>%
    ops %.>%
    print(.)
}

if(requireNamespace("RSQLite", quietly = TRUE)) {
  db <- DBI::dbConnect(RSQLite::SQLite(), ":memory:")
  DBI::dbWriteTable(db,
                    'd',
                    d,
                    overwrite = TRUE,
                    temporary = TRUE)

  db %.>%
    ops %.>%
    print(.)
  DBI::dbDisconnect(db)
}

```

rowrecs_to_blocks_spec

Create a row records to block records transform specification.

Description

Create a row records to block records transform specification object that holds the pivot control table, specification of extra row keys, and control table keys.

Usage

```

rowrecs_to_blocks_spec(
  controlTable,
  ...,
  recordKeys = character(0),
  controlTableKeys = colnames(controlTable)[[1]],
  checkNames = TRUE,
  checkKeys = FALSE,

```

```

    strict = FALSE,
    allow_rqdatatable = FALSE
  )

```

Arguments

controlTable an all character data frame or cdata pivot control.
 ... not used, force later arguments to bind by name.
 recordKeys vector of columns identifying records.
 controlTableKeys vector of keying columns of the controlTable.
 checkNames passed to rowrecs_to_blocks.
 checkKeys passed to rowrecs_to_blocks.
 strict passed to rowrecs_to_blocks.
 allow_rqdatatable logical, if TRUE allow rqdatatable shortcutting on simple conversions.

Value

a record specification object

Examples

```

d <- wrapr::build_frame(
  "id" , "AUC", "R2" |
  1 , 0.7 , 0.4 |
  2 , 0.8 , 0.5 )

transform <- rowrecs_to_blocks_spec(
  wrapr::qchar_frame(
    "measure", "value" |
    "AUC" , AUC |
    "R2" , R2 ),
  recordKeys = "id")

print(transform)

d %>% transform

inv_transform <- t(transform)
print(inv_transform)

# identity (in structure)
d %>% transform %>% inv_transform

# identity again (using .() "immediate" notation)
d %>% transform %>% .(t(transform))

```

unpivot_to_blocks	<i>Map a data records from row records to block records with one record row per columnsToTakeFrom value.</i>
-------------------	--

Description

Map a data records from row records (records that are exactly single rows) to block records (records that may be more than one row). All columns not named in columnsToTakeFrom are copied to each record row in the result.

Usage

```
unpivot_to_blocks(  
  data,  
  nameForNewKeyColumn,  
  nameForNewValueColumn,  
  columnsToTakeFrom,  
  ...,  
  nameForNewClassColumn = NULL,  
  checkNames = TRUE,  
  checkKeys = FALSE,  
  strict = FALSE,  
  tmp_name_source = wrapr::mk_tmp_name_source("upb"),  
  temporary = TRUE,  
  allow_rqdatatable = FALSE  
)
```

```
layout_to_blocks(  
  data,  
  nameForNewKeyColumn,  
  nameForNewValueColumn,  
  columnsToTakeFrom,  
  ...,  
  nameForNewClassColumn = NULL,  
  checkNames = TRUE,  
  checkKeys = FALSE,  
  strict = FALSE,  
  tmp_name_source = wrapr::mk_tmp_name_source("upb"),  
  temporary = TRUE,  
  allow_rqdatatable = FALSE  
)
```

```
pivot_to_blocks(  
  data,  
  nameForNewKeyColumn,  
  nameForNewValueColumn,  
  columnsToTakeFrom,
```

```

    ...,
    nameForNewClassColumn = NULL,
    checkNames = TRUE,
    checkKeys = FALSE,
    strict = FALSE,
    tmp_name_source = wrapr::mk_tmp_name_source("upb"),
    temporary = TRUE,
    allow_rqdatatable = FALSE
)

## Default S3 method:
unpivot_to_blocks(
  data,
  nameForNewKeyColumn,
  nameForNewValueColumn,
  columnsToTakeFrom,
  ...,
  nameForNewClassColumn = NULL,
  checkNames = TRUE,
  checkKeys = FALSE,
  strict = FALSE,
  allow_rqdatatable = FALSE
)

## S3 method for class 'relop'
unpivot_to_blocks(
  data,
  nameForNewKeyColumn,
  nameForNewValueColumn,
  columnsToTakeFrom,
  ...,
  checkNames = TRUE,
  checkKeys = FALSE,
  strict = FALSE,
  nameForNewClassColumn = NULL,
  tmp_name_source = wrapr::mk_tmp_name_source("upb"),
  temporary = TRUE,
  allow_rqdatatable = FALSE
)

```

Arguments

data data.frame to work with.
nameForNewKeyColumn character name of column to write new keys in.
nameForNewValueColumn character name of column to write new values in.
columnsToTakeFrom character array names of columns to take values from.

... force later arguments to bind by name.

`nameForNewClassColumn` optional name to land original cell classes to.

`checkNames` logical, if TRUE check names.

`checkKeys` logical, if TRUE check `columnsToCopy` form row keys (not a requirement, unless you want to be able to invert the operation).

`strict` logical, if TRUE check control table name forms.

`tmp_name_source` a `tempNameGenerator` from `cdता::mk_tmp_name_source()`

`temporary` logical, if TRUE make result temporary.

`allow_rqdatatable` logical, if TRUE allow `rqdatatable` shortcutting on simple conversions.

Value

new `data.frame` with values moved to rows.

See Also

[pivot_to_rowrecs](#), [rowrecs_to_blocks](#)

Examples

```
d <- data.frame(model_name = "m1", AUC = 0.6, R2 = 0.2)
unpivot_to_blocks(d,
  nameForNewKeyColumn= 'meas',
  nameForNewValueColumn= 'val',
  columnsToTakeFrom= c('AUC', 'R2')) %>%
  print(.)

d <- data.frame(AUC= 0.6, R2= 0.2)
ops <- rquery::local_td(d) %>%
  unpivot_to_blocks(
    ,
    nameForNewKeyColumn= 'meas',
    nameForNewValueColumn= 'val',
    columnsToTakeFrom= c('AUC', 'R2'))
cat(format(ops))

if(requireNamespace("rqdatatable", quietly = TRUE)) {
  library("rqdatatable")
  d %>%
    ops %>%
    print(.)
}

if(requireNamespace("RSQLite", quietly = TRUE)) {
  db <- DBI::dbConnect(RSQLite::SQLite(), ":memory:")
  DBI::dbWriteTable(db,
```

```

        'd',
        d,
        overwrite = TRUE,
        temporary = TRUE)
db %.>%
  ops %.>%
  print(.)
DBI::dbDisconnect(db)
}

```

 %//%

Factor-out (aggregate/project) block records into row records.

Description

Call `blocks_to_rowrecs()`.

Usage

```
table %//% transform
```

Arguments

<code>table</code>	data (data.frame or relop).
<code>transform</code>	a <code>rowrecs_to_blocks_spec</code> .

Value

`blocks_to_rowrecs()` result.

Examples

```

d <- wrapr::build_frame(
  "id", "measure", "value" |
  1 , "AUC" , 0.7 |
  1 , "R2" , 0.4 |
  2 , "AUC" , 0.8 |
  2 , "R2" , 0.5 )

transform <- blocks_to_rowrecs_spec(
  wrapr::qchar_frame(
    "measure", "value" |
    "AUC" , AUC |
    "R2" , R2 ),
  recordKeys = "id")

d %//% transform

```

```
# identity (in structure)
d %/% transform %%% t(transform)
```

%%%

Multiply/join row records into block records.

Description

Call `rowrecs_to_blocks()`.

Usage

```
table %%% transform
```

Arguments

<code>table</code>	data (data.frame or relap).
<code>transform</code>	a <code>rowrecs_to_blocks_spec</code> .

Value

`rowrecs_to_blocks()` result.

Examples

```
d <- wrapr::build_frame(
  "id", "AUC", "R2" |
  1 , 0.7 , 0.4 |
  2 , 0.8 , 0.5 )

transform <- rowrecs_to_blocks_spec(
  wrapr::qchar_frame(
    "measure", "value" |
    "AUC" , AUC |
    "R2" , R2 ),
  recordKeys = "id")

d %%% transform

# identity (in structure)
d %%% transform %/% t(transform)
```

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