

Package ‘rtables’

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Title Reporting Tables

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Description Reporting tables often have structure that goes beyond simple rectangular data. The 'rtables' package provides a framework for declaring complex multi-level tabulations and then applying them to data. This framework models both tabulation and the resulting tables as hierarchical, tree-like objects which support sibling sub-tables, arbitrary splitting or grouping of data in row and column dimensions, cells containing multiple values, and the concept of contextual summary computations. A convenient pipe-able interface is provided for declaring table layouts and the corresponding computations, and then applying them to data.

Depends methods, magrittr, formatters (>= 0.3.0), R (>= 2.10)

Imports stats, htmltools, grid

Suggests dplyr, tibble, tidyr, testthat, xml2, knitr, rmarkdown, flextable, officer

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URL <https://github.com/roche/rtables>, <https://roche.github.io/rtables/>

BugReports <https://github.com/roche/rtables/issues>

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'compare_rtables.R' 'deprecated.R' 'format_rcell.R' 'indent.R'
'make_subset_expr.R' 'simple_analysis.R' 'split_funs.R'
'summary.R' 'tree_accessors.R' 'tt_afun_utils.R'
'tt_compare_tables.R' 'tt_compatibility.R' 'tt_dotabulation.R'
'tt_paginate.R' 'tt_pos_and_access.R' 'tt_showmethods.R'
'tt_sort.R' 'tt_test_afuns.R' 'tt_toString.R' 'tt_export.R'
'index_footnotes.R' 'tt_from_df.R' 'zzz_constants.R'

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add_colcounts	<i>Add the column population counts to the header</i>
---------------	---

Description

Add the data derived column counts.

Usage

```
add_colcounts(lyt, format = "(N=xx)")
```

Arguments

lyt	layout object pre-data used for tabulation
format	FormatSpec. Format associated with this split. Formats can be declared via strings ("xx.x") or function. In cases such as analyze calls, they can character vectors or lists of functions.

Details

It is often the case that the the column counts derived from the input data to build_table is not representative of the population counts. For example, if events are counted in the table and the header should display the number of subjects and not the total number of events. In that case use the col_count argument in build_table to control the counts displayed in the table header.

Value

A PreDataTableLayouts object suitable for passing to further layouting functions, and to build_table.

Author(s)

Gabriel Becker

Examples

```
l <- basic_table() %>% split_cols_by("ARM") %>%
  add_colcounts() %>%
  split_rows_by("RACE", split_fun = drop_split_levels) %>%
  analyze("AGE", afun = function(x) list(min = min(x), max = max(x)))
l

build_table(l, DM)
```

add_existing_table *Add an already calculated table to the layout*

Description

Add an already calculated table to the layout

Usage

```
add_existing_table(lyt, tt, indent_mod = 0)
```

Arguments

lyt	layout object pre-data used for tabulation
tt	TableTree (or related class). A TableTree object representing a populated table.
indent_mod	numeric. Modifier for the default indent position for the structure created by this function(subtable, content table, or row) <i>and all of that structure's children</i> . Defaults to 0, which corresponds to the unmodified default behavior.

Value

A PreDataTableLayouts object suitable for passing to further layouting functions, and to build_table.

Author(s)

Gabriel Becker

Examples

```
tbl1 <- basic_table() %>%
  split_cols_by("ARM") %>%
  analyze("AGE", afun = mean, format = "xx.xx") %>%
  build_table(DM)

tbl1

tbl2 <- basic_table() %>% split_cols_by("ARM") %>%
  analyze("AGE", afun = sd, format = "xx.xx") %>%
  add_existing_table(tbl1) %>%
  build_table(DM)

tbl2

table_structure(tbl2)

row_paths_summary(tbl2)
```

add_overall_col	<i>Add Overall Column</i>
-----------------	---------------------------

Description

This function will *only* add an overall column at the *top* level of splitting, NOT within existing column splits. See [add_overall_level](#) for the recommended way to add overall columns more generally within existing splits.

Usage

```
add_overall_col(lyt, label)
```

Arguments

lyt	layout object pre-data used for tabulation
label	character(1). A label (not to be confused with the name) for the object/structure.

Value

A PreDataTableLayouts object suitable for passing to further layouting functions, and to `build_table`.

See Also

[add_overall_level](#)

Examples

```
l <- basic_table() %>%
  split_cols_by("ARM") %>%
  add_overall_col("All Patients") %>%
  analyze("AGE")

l

build_table(l, DM)
```

add_overall_level *Add an virtual 'overall' level to split*

Description

Add an virtual 'overall' level to split

Usage

```
add_overall_level(
  valname = "Overall",
  label = valname,
  extra_args = list(),
  first = TRUE,
  trim = FALSE
)
```

Arguments

valname	character(1). 'Value' to be assigned to the implicit all-observations split level. Defaults to "Overall"
label	character(1). A label (not to be confused with the name) for the object/structure.
extra_args	list. Extra arguments to be passed to the tabulation function. Element position in the list corresponds to the children of this split. Named elements in the child-specific lists are ignored if they do not match a formal argument of the tabulation function.
first	logical(1). Should the implicit level appear first (TRUE) or last FALSE. Defaults to TRUE.
trim	logical(1). Should splits corresponding with 0 observations be kept when tabulating.

Value

a closure suitable for use as a splitting function (splfun) when creating a table layout

Examples

```

l <- basic_table() %>%
  split_cols_by("ARM", split_fun = add_overall_level("All Patients", first = FALSE)) %>%
  analyze("AGE")

build_table(l, DM)

l <- basic_table() %>%
  split_cols_by("ARM") %>%
  split_rows_by("RACE", split_fun = add_overall_level("All Ethnicities")) %>%
  summarize_row_groups(label_fstr = "%s (n)") %>%
  analyze("AGE")

l

build_table(l, DM)

```

all_zero_or_na	<i>Trimming and Pruning Criteria</i>
----------------	--------------------------------------

Description

Criteria functions (and constructors thereof) for trimming and pruning tables.

Usage

```

all_zero_or_na(tr)

all_zero(tr)

content_all_zeros_nas(tt, criteria = all_zero_or_na)

prune_empty_level(tt)

prune_zeros_only(tt)

low_obs_pruner(min, type = c("sum", "mean"))

```

Arguments

tr	TableRow (or related class). A TableRow object representing a single row within a populated table.
tt	TableTree (or related class). A TableTree object representing a populated table.
criteria	function. Function which takes a TableRow object and returns TRUE if that row should be removed. Defaults to all_zero_or_na

min	numeric(1). (lob_obs_pruner only). Minimum aggregate count value. Subtables whose combined/average count are below this threshold will be pruned
type	character(1). How count values should be aggregated. Must be "sum" (the default) or "mean"

Details

`all_zero_or_na` returns TRUE (and thus indicates trimming/pruning) for any *non-LabelRow* `TableRow` which contain only any mix of NA (including NaN), 0, Inf and -Inf values.

`all_zero` returns TRUE for any non-Label row which contains only (non-missing) zero values.

`content_all_zeros_nas` Prunes a subtable if a) it has a content table with exactly one row in it, and b) `all_zero_or_na` returns TRUE for that single content row. In practice, when the default summary/content function was used, this represents pruning any subtable which corresponds to an empty set of the input data (e.g., because a factor variable was used in `split_rows_by` but not all levels were present in the data).

`prune_empty_level` combines `all_zero_or_na` behavior for `TableRow` objects, `content_all_zeros_nas` on `content_table(tt)` for `TableTree` objects, and an addition check that returns TRUE if the `tt` has no children.

`prune_zeros_only` behaves as `prune_empty_levels` does, except that like `all_zero` it prunes only in the case of all non-missing zero values.

`lob_obs_pruner` is a *constructor function* which, when called, returns a pruning criteria function which will prune on content rows by comparing sum or mean (dictated by `type`) of the count count portions of the cell values (defined as the first value per cell regardless of how many values per cell there are) against `min`.

Value

A logical value indicating whether `tr` should be included (TRUE) or pruned (FALSE) during pruning.

See Also

`prune_table()`, `trim_rows()`

analyze

Generate Rows Analyzing Variables Across Columns

Description

Adding `/analyzed variables/` to our table layout defines the primary tabulation to be performed. We do this by adding calls to `analyze` and/or `analyze_colvars` into our layout pipeline. As with adding further splitting, the tabulation will occur at the current/next level of nesting by default.

Usage

```
analyze(
  lyt,
  vars,
  afun = simple_analysis,
  var_labels = vars,
  table_names = vars,
  format = NULL,
  nested = TRUE,
  inclNAs = FALSE,
  extra_args = list(),
  show_labels = c("default", "visible", "hidden"),
  indent_mod = 0L
)
```

Arguments

lyt	layout object pre-data used for tabulation
vars	character vector. Multiple variable names.
afun	function. Analysis function, must take x or df as its first parameter. Can optionally take other parameters which will be populated by the tabulation framework. See Details in analyze .
var_labels	character. Variable labels for 1 or more variables
table_names	character. Names for the tables representing each atomic analysis. Defaults to var.
format	FormatSpec. Format associated with this split. Formats can be declared via strings ("xx.x") or function. In cases such as analyze calls, they can character vectors or lists of functions.
nested	boolean. Should this layout instruction be applied within the existing layout structure <i>if possible</i> (TRUE, the default) or as a new top-level element ('FALSE). Ignored if it would nest a split underneath analyses, which is not allowed.
inclNAs	boolean. Should observations with NA in the var variable(s) be included when performing this analysis. Defaults to FALSE
extra_args	list. Extra arguments to be passed to the tabulation function. Element position in the list corresponds to the children of this split. Named elements in the child-specific lists are ignored if they do not match a formal argument of the tabulation function.
show_labels	character(1). Should the variable labels for corresponding to the variable(s) in vars be visible in the resulting table.
indent_mod	numeric. Modifier for the default indent position for the structure created by this function(subtable, content table, or row) <i>and all of that structure's children</i> . Defaults to 0, which corresponds to the unmodified default behavior.

Details

When non-NULL `format` is used to specify formats for all generated rows, and can be a character vector, a function, or a list of functions. It will be repped out to the number of rows once this is known during the tabulation process, but will be overridden by formats specified within `rcell` calls in `afun`.

The analysis function (`afun`) should take as its first parameter either `x` or `df`. Which of these the function accepts changes the behavior when tabulation is performed.

- If `afun`'s first parameter is `x`, it will receive the corresponding subset *vector* of data from the relevant column (from `var` here) of the raw data being used to build the table.
- If `afun`'s first parameter is `df`, it will receive the corresponding subset *data.frame* (i.e. all columns) of the raw data being tabulated

In addition to differentiation on the first argument, the analysis function can optionally accept a number of other parameters which, *if and only if* present in the formals will be passed to the function by the tabulation machinery. These are as follows:

.N_col column-wise N (column count) for the full column being tabulated within

.N_total overall N (all observation count, defined as sum of column counts) for the tabulation

.N_row row-wise N (row group count) for the group of observations being analyzed (ie with no column-based subsetting)

.df_row data.frame for observations in the row group being analyzed (ie with no column-based subsetting)

.var variable that is analyzed

.ref_group data.frame or vector of subset corresponding to the `ref_group` column including subsetting defined by row-splitting. Optional and only required/meaningful if a `ref_group` column has been defined

.ref_full data.frame or vector of subset corresponding to the `ref_group` column without subsetting defined by row-splitting. Optional and only required/meaningful if a `ref_group` column has been defined

.in_ref_col boolean indicates if calculation is done for cells withing the reference column

.spl_context data.frame, each row gives information about a previous/'ancestor' split state. see below

Value

A `PreDataTableLayouts` object suitable for passing to further layouting functions, and to `build_table`.

.spl_context Details

The `.spl_context` data.frame gives information about the subsets of data corresponding to the splits within-which the current `analyze` action is nested. Taken together, these correspond to the path that the resulting (set of) rows the analysis function is creating, although the information is in a slightly different form. Each split (which correspond to groups of rows in the resulting table) is represented via the following columns:

split The name of the split (often the variable being split in the simple case)
value The string representation of the value at that split
full_parent_df a dataframe containing the full data (ie across all columns) corresponding to the path defined by the combination of `split` and `value` of this row *and all rows above this row*
all_cols_n the number of observations corresponding to this row grouping (union of all columns)
(row-split and analyze contexts only) <1 column for each column in the table structure These list columns (named the same as `names(col_exprs(tab))`) contain logical vectors corresponding to the subset of this row's `full_parent_df` corresponding to that column
cur_col_subset List column containing logical vectors indicating the subset of that row's `full_parent_df` for the column currently being created by the analysis function
cur_col_n integer column containing the observation counts for that split

note Within analysis functions that accept `.spl_context`, the `all_cols_n` and `cur_col_n` columns of the dataframe will contain the 'true' observation counts corresponding to the row-group and row-group x column subsets of the data. These numbers will not, and currently cannot, reflect alternate column observation counts provided by the `alt_counts_df`, `col_counts` or `col_total` arguments to `build_table`

Note

None of the arguments described in the Details section can be overridden via `extra_args` or when calling `make_afun`. `.N_col` and `.N_total` can be overridden via the `col_counts` argument to `build_table`. Alternative values for the others must be calculated within `afun` based on a combination of extra arguments and the unmodified values provided by the tabulation framework.

Author(s)

Gabriel Becker

Examples

```
l <- basic_table() %>%
  split_cols_by("ARM") %>%
  analyze("AGE", afun = list_wrap_x(summary) , format = "xx.xx")
l
build_table(l, DM)

l <- basic_table() %>%
  split_cols_by("Species") %>%
  analyze(head(names(iris), -1), afun = function(x) {
    list(
      "mean / sd" = rcell(c(mean(x), sd(x)), format = "xx.xx (xx.xx)"),
      "range" = rcell(diff(range(x)), format = "xx.xx")
    )
  })
l
build_table(l, iris)
```

AnalyzeVarSplit	<i>Define a subset tabulation/analysis</i>
-----------------	--

Description

Define a subset tabulation/analysis

Define a subset tabulation/analysis

Usage

```
AnalyzeVarSplit(  
  var,  
  split_label = var,  
  afun,  
  defrowlab = "",  
  cfun = NULL,  
  cformat = NULL,  
  split_format = NULL,  
  inclNAs = FALSE,  
  split_name = var,  
  extra_args = list(),  
  indent_mod = 0L,  
  label_pos = "default",  
  cvar = ""  
)
```

```
AnalyzeColVarSplit(  
  afun,  
  defrowlab = "",  
  cfun = NULL,  
  cformat = NULL,  
  split_format = NULL,  
  inclNAs = FALSE,  
  split_name = "",  
  extra_args = list(),  
  indent_mod = 0L,  
  label_pos = "default",  
  cvar = ""  
)
```

```
AnalyzeMultiVars(  
  var,  
  split_label = "",  
  afun,  
  defrowlab = "",  
  cfun = NULL,
```

```

    cformat = NULL,
    split_format = NULL,
    inclNAs = FALSE,
    .payload = NULL,
    split_name = NULL,
    extra_args = list(),
    indent_mod = 0L,
    child_labels = c("default", "topleft", "visible", "hidden"),
    child_names = var,
    cvar = ""
)

```

Arguments

<code>var</code>	string, variable name
<code>split_label</code>	string. Label string to be associated with the table generated by the split. Not to be confused with labels assigned to each child (which are based on the data and type of split during tabulation).
<code>afun</code>	function. Analysis function, must take <code>x</code> or <code>df</code> as its first parameter. Can optionally take other parameters which will be populated by the tabulation framework. See Details in analyze .
<code>defrowlab</code>	character. Default row labels if they are not specified by the return value of <code>afun</code>
<code>cfun</code>	list/function/NULL. tabulation function(s) for creating content rows. Must accept <code>x</code> or <code>df</code> as first parameter. Must accept <code>labelstr</code> as the second argument. Can optionally accept all optional arguments accepted by analysis functions. See analyze .
<code>cformat</code>	format spec. Format for content rows
<code>split_format</code>	FormatSpec. Default format associated with the split being created.
<code>inclNAs</code>	boolean. Should observations with NA in the <code>var</code> variable(s) be included when performing this analysis. Defaults to FALSE
<code>split_name</code>	string. Name associated with this split (for pathing, etc)
<code>extra_args</code>	list. Extra arguments to be passed to the tabulation function. Element position in the list corresponds to the children of this split. Named elements in the child-specific lists are ignored if they do not match a formal argument of the tabulation function.
<code>indent_mod</code>	numeric. Modifier for the default indent position for the structure created by this function(subtable, content table, or row) <i>and all of that structure's children</i> . Defaults to 0, which corresponds to the unmodified default behavior.
<code>label_pos</code>	character(1). Location the variable label should be displayed, Accepts hidden (default for non-analyze row splits), visible, topleft, and - for analyze splits only - default. For analyze calls, <code>default</code> indicates that the variable should be visible if and only if multiple variables are analyzed at the same level of nesting.
<code>cvar</code>	character(1). The variable, if any, which the content function should accept. Defaults to NA.
<code>.payload</code>	Used internally, not intended to be set by end users.

child_labels	string. One of "default", "visible", "hidden". What should the display behavior be for the labels (ie label rows) of the children of this split. Defaults to "default" which flags the label row as visible only if the child has 0 content rows.
child_names	character. Names to be given to the sub splits contained by a compound split (typically a AnalyzeMultiVars split object).

Value

An AnalyzeVarSplit object.

An AnalyzeMultiVars split object.

Author(s)

Gabriel Becker

Gabriel Becker

analyze_colvars	<i>Generate Rows Analyzing Different Variables Across Columns</i>
-----------------	---

Description

Generate Rows Analyzing Different Variables Across Columns

Usage

```
analyze_colvars(
  lyt,
  afun,
  format = NULL,
  nested = TRUE,
  extra_args = list(),
  indent_mod = 0L,
  inclNAs = FALSE
)
```

Arguments

lyt	layout object pre-data used for tabulation
afun	function or list. Function(s) to be used to calculate the values in each column. the list will be repped out as needed and matched by position with the columns during tabulation.
format	FormatSpec. Format associated with this split. Formats can be declared via strings ("xx.x") or function. In cases such as analyze calls, they can character vectors or lists of functions.

nested	boolean. Should this layout instruction be applied within the existing layout structure <i>if possible</i> (TRUE, the default) or as a new top-level element ('FALSE'). Ignored if it would nest a split underneath analyses, which is not allowed.
extra_args	list. Extra arguments to be passed to the tabulation function. Element position in the list corresponds to the children of this split. Named elements in the child-specific lists are ignored if they do not match a formal argument of the tabulation function.
indent_mod	numeric. Modifier for the default indent position for the structure created by this function(subtable, content table, or row) <i>and all of that structure's children</i> . Defaults to 0, which corresponds to the unmodified default behavior.
inclNAs	boolean. Should observations with NA in the var variable(s) be included when performing this analysis. Defaults to FALSE

Value

A PreDataTableLayouts object suitable for passing to further layouting functions, and to build_table.

Author(s)

Gabriel Becker

See Also

[split_cols_by_multivar](#)

Examples

```
library(dplyr)
ANL <- DM %>% mutate(value = rnorm(n()), pctdiff = runif(n()))

## toy example where we take the mean of the first variable and the
## count of >.5 for the second.
colfuns <- list(function(x) rcell(mean(x), format = "xx.x"),
               function(x) rcell(sum(x > .5), format = "xx"))

l <- basic_table() %>%
  split_cols_by("ARM") %>%
  split_cols_by_multivar(c("value", "pctdiff")) %>%
  split_rows_by("RACE", split_label = "ethnicity", split_fun = drop_split_levels) %>%
  summarize_row_groups() %>%
  analyze_colvars(afun = colfuns)

l

build_table(l, ANL)

basic_table() %>% split_cols_by("ARM") %>%
  split_cols_by_multivar(c("value", "pctdiff"), varlabels = c("Measurement", "Pct Diff")) %>%
```



```

split_rows_by("RACE", split_label = "ethnicity", split_fun = drop_split_levels) %>%
summarize_row_groups() %>%
analyze_colvars(afun = mean, format = "xx.xx") %>%
build_table(ANL)

```

append_topleft	<i>Append a description to the 'top-left' materials for the layout</i>
----------------	--

Description

This function *adds* newlines to the current set of "top-left materials".

Usage

```
append_topleft(lyt, newlines)
```

Arguments

lyt	layout object pre-data used for tabulation
newlines	character. The new line(s) to be added to the materials

Details

Adds newlines to the set of strings representing the 'top-left' materials declared in the layout (the content displayed to the left of the column labels when the resulting tables are printed).

Top-left material strings are stored and then displayed *exactly as is*, no structure or indenting is applied to them either when they are added or when they are displayed.

Value

A PreDataTableLayouts object suitable for passing to further layouting functions, and to `build_table`.

Note

Currently, where in the construction of the layout this is called makes no difference, as it is independent of the actual splitting keywords. This may change in the future.

This function is experimental, its name and the details of its behavior are subject to change in future versions.

See Also

`top_left`

Examples

```
library(dplyr)

lyt <- basic_table() %>%
  split_cols_by("ARM") %>%
  split_cols_by("SEX") %>%
  split_rows_by("RACE") %>%
  append_topleft("Ethnicity") %>%
  analyze("AGE") %>%
  append_topleft(" Age")

DM2 <- DM %>% mutate(RACE = factor(RACE), SEX = factor(SEX))

build_table(lyt, DM2)
```

as.vector,TableRow-method
convert to a vector

Description

convert to a vector

Usage

```
## S4 method for signature 'TableRow'
as.vector(x, mode = "any")

## S4 method for signature 'ElementaryTable'
as.vector(x, mode = "any")

## S4 method for signature 'VTableTree'
as.vector(x, mode = "any")
```

Arguments

x ANY. The object to be converted to a vector
mode character(1). Passed on to [as.vector](#)

Value

a vector of the chosen mode (or an error is raised if more than one row was present).

Note

This only works for a table with a single row or a row object.

as_html	<i>Convert an rtable object to a shiny.tag html object</i>
---------	--

Description

The returned html object can be immediately used in shiny and rmarkdown.

Usage

```
as_html(  
  x,  
  width = NULL,  
  class_table = "table table-condensed table-hover",  
  class_tr = NULL,  
  class_td = NULL,  
  class_th = NULL,  
  link_label = NULL  
)
```

Arguments

x	rtable object
width	width
class_table	class for table tag
class_tr	class for tr tag
class_td	class for td tag
class_th	class for th tag
link_label	link anchor label (not including tab: prefix) for the table.

Value

A shiny.tag object representing x in HTML.

Examples

```
tbl <- rtable(  
  header = LETTERS[1:3],  
  format = "xx",  
  rrow("r1", 1,2,3),  
  rrow("r2", 4,3,2, indent = 1),  
  rrow("r3", indent = 2)  
)  
  
as_html(tbl)
```

```

as_html(tbl, class_table = "table", class_tr = "row")

as_html(tbl, class_td = "aaa")

## Not run:
Viewer(tbl)

## End(Not run)

```

basic_table

Layout with 1 column and zero rows

Description

Every layout must start with a basic table.

Usage

```

basic_table(
  title = "",
  subtitles = character(),
  main_footer = character(),
  prov_footer = character(),
  show_colcounts = FALSE
)

```

Arguments

title	character(1). Main title. Ignored for subtables.
subtitles	character. Subtitles. Ignored for subtables.
main_footer	character. Main global (non-referential) footer materials.
prov_footer	character. Provenance-related global footer materials. Generally should not be modified by hand.
show_colcounts	logical(1). Should column counts be displayed in the resulting table when this layout is applied to data

Value

A PreDataTableLayouts object suitable for passing to further layouting functions, and to `build_table`.

Examples

```

lyt <- basic_table() %>%
  analyze("AGE", afun = mean)

build_table(lyt, DM)

```

```

lyt <- basic_table(title = "Title of table", subtitles = c("a number", "of subtitles"),
  main_footer = "test footer",
  prov_footer = paste("test.R program, executed at", Sys.time())) %>%
  split_cols_by("ARM") %>%
  analyze("AGE", mean)

build_table(lyt, DM)

```

build_table

Create a table from a layout and data

Description

Layouts are used to describe a table pre-data. `build_rable` is used to create a table using a layout and a dataset.

Usage

```

build_table(
  lyt,
  df,
  alt_counts_df = NULL,
  col_counts = NULL,
  col_total = if (is.null(alt_counts_df)) nrow(df) else nrow(alt_counts_df),
  topleft = NULL,
  hsep = default_hsep(),
  ...
)

```

Arguments

<code>lyt</code>	layout object pre-data used for tabulation
<code>df</code>	dataset (data.frame or tibble)
<code>alt_counts_df</code>	dataset (data.frame or tibble). Alternative full data the rtables framework will use (<i>only</i>) when calculating column counts.
<code>col_counts</code>	numeric (or NULL). Deprecated. If non-null, column counts which override those calculated automatically during tabulation. Must specify "counts" for <i>all</i> resulting columns if non-NULL. NA elements will be replaced with the automatically calculated counts.
<code>col_total</code>	integer(1). The total observations across all columns. Defaults to <code>nrow(df)</code> .
<code>topleft</code>	character. Override values for the "top left" material to be displayed during printing.

hsep	character(1). Set of character(s) to be repeated as the separator between the header and body of the table when rendered as text. Defaults to a connected horizontal line (unicode 2014) in locals that use a UTF charset, and to - elsewhere (with a once per session warning).
...	currently ignored.

Details

When `alt_counts_df` is specified, column counts are calculated by applying the exact column sub-setting expressions determined when applying column splitting to the main data (`df`) to `alt_counts_df` and counting the observations in each resulting subset.

In particular, this means that in the case of splitting based on cuts of the data, any dynamic cuts will have been calculated based on `df` and simply re-used for the count calculation.

Value

A `TableTree` or `ElementaryTable` object representing the table created by performing the tabulations declared in `lyt` to the data `df`.

Note

When overriding the column counts or totals care must be taken that, e.g., `length()` or `nrow()` are not called within tabulation functions, because those will NOT give the overridden counts. Writing/using tabulation functions which accept `.N_col` and `.N_total` or do not rely on column counts at all (even implicitly) is the only way to ensure overridden counts are fully respected.

Author(s)

Gabriel Becker

Examples

```
l <- basic_table() %>%
  split_cols_by("Species") %>%
  analyze("Sepal.Length", afun = function(x) {
    list(
      "mean (sd)" = rcell(c(mean(x), sd(x)), format = "xx.xx (xx.xx)"),
      "range" = diff(range(x))
    )
  })

l

build_table(l, iris)

# analyze multiple variables
l <- basic_table() %>%
  split_cols_by("Species") %>%
  analyze(c("Sepal.Length", "Petal.Width"), afun = function(x) {
    list(
```

```

      "mean (sd)" = rcell(c(mean(x), sd(x)), format = "xx.xx (xx.xx)"),
      "range" = diff(range(x))
    )
  })

build_table(l, iris)

# an example more relevant for clinical trials
l <- basic_table() %>%
  split_cols_by("ARM") %>%
  analyze("AGE", afun = function(x) {
    setNames(as.list(fivenum(x)), c("minimum", "lower-hinge", "median", "upper-hinge", "maximum"))
  })

build_table(l, DM)

build_table(l, subset(DM, AGE > 40))

# with column counts
l2 <- l %>%
  add_colcounts()
build_table(l2, DM)

# with column counts calculated based on different data
miniDM <- DM[sample(1:NROW(DM), 100),]
build_table(l2, DM, alt_counts_df = miniDM)

build_table(l, DM, col_counts = 1:3)

```

cbind_rtables

cbind two rtables

Description

cbind two rtables

Usage

```
cbind_rtables(x, ...)
```

Arguments

x	A table or row object
...	1 or more further objects of the same class as x

Value

A formal table object.

Examples

```

x <- rtable(c("A", "B"), rrow("row 1", 1,2), rrow("row 2", 3, 4))

y <- rtable("C", rrow("row 1", 5), rrow("row 2", 6))

z <- rtable("D", rrow("row 1", 9), rrow("row 2", 10))

t1 <- cbind_rtables(x, y)
t1

t2 <- cbind_rtables(x, y, z)
t2

col_paths_summary(t1)
col_paths_summary(t2)

```

CellValue

Cell Value constructor

Description

Cell Value constructor

Usage

```

CellValue(
  val,
  format = NULL,
  colspan = 1L,
  label = NULL,
  indent_mod = NULL,
  footnotes = NULL,
  align = NULL,
  format_na_str = NULL
)

```

Arguments

val	ANY. value in the cell exactly as it should be passed to a formatter or returned when extracted
format	FormatSpec. Format associated with this split. Formats can be declared via strings ("xx.x") or function. In cases such as analyze calls, they can character vectors or lists of functions.
colspan	integer(1). Columnspan value.
label	character(1). A label (not to be confused with the name) for the object/structure.

indent_mod	numeric. Modifier for the default indent position for the structure created by this function(subtable, content table, or row) <i>and all of that structure's children</i> . Defaults to 0, which corresponds to the unmodified default behavior.
footnotes	list or NULL. Referential footnote messages for the cell.
align	character(1). Alignment the value should be rendered with. See rtables_aligns for currently supported alignments.
format_na_str	character(1). String which should be displayed when formatted if this cell's value(s) are all NA.

Value

An object representing the value within a single cell within a populated table. The underlying structure of this object is an implementation detail and should not be relied upon beyond calling accessors for the class.

cell_values	<i>Retrieve cell values by row and column path</i>
-------------	--

Description

Retrieve cell values by row and column path

Usage

```
cell_values(tt, rowpath = NULL, colpath = NULL, omit_labrows = TRUE)

## S4 method for signature 'VTableTree'
cell_values(tt, rowpath = NULL, colpath = NULL, omit_labrows = TRUE)

## S4 method for signature 'TableRow'
cell_values(tt, rowpath = NULL, colpath = NULL, omit_labrows = TRUE)

## S4 method for signature 'LabelRow'
cell_values(tt, rowpath = NULL, colpath = NULL, omit_labrows = TRUE)

value_at(tt, rowpath = NULL, colpath = NULL)

## S4 method for signature 'VTableTree'
value_at(tt, rowpath = NULL, colpath = NULL)

## S4 method for signature 'TableRow'
value_at(tt, rowpath = NULL, colpath = NULL)

## S4 method for signature 'LabelRow'
value_at(tt, rowpath = NULL, colpath = NULL)
```

Arguments

tt	TableTree (or related class). A TableTree object representing a populated table.
rowpath	character. Path in row-split space to the desired row(s). Can include "@content".
colpath	character. Path in column-split space to the desired column(s). Can include "*".
omit_labrows	logical(1). Should label rows underneath rowpath be omitted (TRUE, the default), or return empty lists of cell "values" (FALSE).

Value

for `cell_values`, a *list* (regardless of the type of value the cells hold). if `rowpath` defines a path to a single row, `cell_values` returns the list of cell values for that row, otherwise a list of such lists, one for each row captured underneath `rowpath`. This occurs after subsetting to `colpath` has occurred.

For `value_at` the "unwrapped" value of a single cell, or an error, if the combination of `rowpath` and `colpath` do not define the location of a single cell in `tt`.

Note

`cell_values` will return a single cell's value wrapped in a list. Use `value_at` to receive the "bare" cell value.

Examples

```
l <- basic_table() %>% split_cols_by("ARM") %>%
  split_cols_by("SEX") %>%
  split_rows_by("RACE") %>%
  summarize_row_groups() %>%
  split_rows_by("STRATA1") %>%
  analyze("AGE")

library(dplyr) ## for mutate
tbl <- build_table(1, DM %>% mutate(SEX = droplevels(SEX), RACE = droplevels(RACE)))

row_paths_summary(tbl)
col_paths_summary(tbl)

cell_values(tbl, c("RACE", "ASIAN", "STRATA1", "B"), c("ARM", "A: Drug X", "SEX", "F"))

# it's also possible to access multiple values by being less specific
cell_values(tbl, c("RACE", "ASIAN", "STRATA1"), c("ARM", "A: Drug X", "SEX", "F"))
cell_values(tbl, c("RACE", "ASIAN"), c("ARM", "A: Drug X", "SEX", "M"))

## any arm, male columns from the ASIAN content (ie summary) row
cell_values(tbl, c("RACE", "ASIAN", "@content"), c("ARM", "B: Placebo", "SEX", "M"))
cell_values(tbl, c("RACE", "ASIAN", "@content"), c("ARM", "*", "SEX", "M"))

## all columns
cell_values(tbl, c("RACE", "ASIAN", "STRATA1", "B"))
```

```

## all columns for the Combination arm
cell_values(tbl, c("RACE", "ASIAN", "STRATA1", "B"), c("ARM", "C: Combination"))

cvlist <- cell_values(tbl, c("RACE", "ASIAN", "STRATA1", "B", "AGE", "Mean"),
  c("ARM", "B: Placebo", "SEX", "M"))
cvnolist <- value_at(tbl, c("RACE", "ASIAN", "STRATA1", "B", "AGE", "Mean"),
  c("ARM", "B: Placebo", "SEX", "M"))
stopifnot(identical(cvlist[[1]], cvnolist))

```

clayout

Column information/structure accessors

Description

Column information/structure accessors

Usage

```

clayout(obj)

## S4 method for signature 'VTableNodeInfo'
clayout(obj)

## S4 method for signature 'PreDataTableLayouts'
clayout(obj)

## S4 method for signature 'ANY'
clayout(obj)

clayout(object) <- value

## S4 replacement method for signature 'PreDataTableLayouts'
clayout(object) <- value

col_info(obj)

## S4 method for signature 'VTableNodeInfo'
col_info(obj)

col_info(obj) <- value

## S4 replacement method for signature 'TableRow'
col_info(obj) <- value

## S4 replacement method for signature 'ElementaryTable'
col_info(obj) <- value

## S4 replacement method for signature 'TableTree'

```

```
col_info(obj) <- value

coltree(obj, df = NULL, rtpos = TreePos())

## S4 method for signature 'InstantiatedColumnInfo'
coltree(obj, df = NULL, rtpos = TreePos())

## S4 method for signature 'PreDataTableLayouts'
coltree(obj, df = NULL, rtpos = TreePos())

## S4 method for signature 'PreDataColLayout'
coltree(obj, df = NULL, rtpos = TreePos())

## S4 method for signature 'LayoutColTree'
coltree(obj, df = NULL, rtpos = TreePos())

## S4 method for signature 'VTableTree'
coltree(obj, df = NULL, rtpos = TreePos())

## S4 method for signature 'TableRow'
coltree(obj, df = NULL, rtpos = TreePos())

col_exprs(obj, df = NULL)

## S4 method for signature 'PreDataTableLayouts'
col_exprs(obj, df = NULL)

## S4 method for signature 'PreDataColLayout'
col_exprs(obj, df = NULL)

## S4 method for signature 'InstantiatedColumnInfo'
col_exprs(obj, df = NULL)

col_counts(obj)

## S4 method for signature 'InstantiatedColumnInfo'
col_counts(obj)

## S4 method for signature 'VTableNodeInfo'
col_counts(obj)

col_counts(obj) <- value

## S4 replacement method for signature 'InstantiatedColumnInfo'
col_counts(obj) <- value

## S4 replacement method for signature 'VTableNodeInfo'
col_counts(obj) <- value
```

```

col_total(obj)

## S4 method for signature 'InstantiatedColumnInfo'
col_total(obj)

## S4 method for signature 'VTableNodeInfo'
col_total(obj)

col_total(obj) <- value

## S4 replacement method for signature 'InstantiatedColumnInfo'
col_total(obj) <- value

## S4 replacement method for signature 'VTableNodeInfo'
col_total(obj) <- value

```

Arguments

obj	ANY. The object for the accessor to access or modify
object	The object to modify in-place
value	The new value
df	data.frame/NULL. Data to use if the column information is being generated from a Pre-Data layout object
rtpos	TreePos. Root position.

Value

A LayoutColTree object.
 Various column information, depending on the accessor used.

clear_indent_mods	<i>Clear All Indent Mods from a Table</i>
-------------------	---

Description

Clear All Indent Mods from a Table

Usage

```

clear_indent_mods(tt)

## S4 method for signature 'VTableTree'
clear_indent_mods(tt)

## S4 method for signature 'TableRow'
clear_indent_mods(tt)

```

Arguments

`tt` `TableTree` (or related class). A `TableTree` object representing a populated table.

Value

The same class as `tt`, with all indent mods set to zero.

Examples

```
t1 <- basic_table() %>%
  summarize_row_groups("STUDYID", label_fstr = "overall summary") %>%
  split_rows_by("AEBODSYS", child_labels = "visible") %>%
  summarize_row_groups("STUDYID", label = "subgroup summary") %>%
  analyze("AGE", indent_mod = -1L) %>%
  build_table(ex_adae)
t1
clear_indent_mods(t1)
```

<code>collect_leaves</code>	<i>Collect leaves of a table tree</i>
-----------------------------	---------------------------------------

Description

Collect leaves of a table tree

Usage

```
collect_leaves(tt, incl.cont = TRUE, add.labrows = FALSE)
```

```
## S4 method for signature 'TableTree'
collect_leaves(tt, incl.cont = TRUE, add.labrows = FALSE)
```

```
## S4 method for signature 'ElementaryTable'
collect_leaves(tt, incl.cont = TRUE, add.labrows = FALSE)
```

```
## S4 method for signature 'VTree'
collect_leaves(tt, incl.cont = TRUE, add.labrows = FALSE)
```

```
## S4 method for signature 'VLeaf'
collect_leaves(tt, incl.cont = TRUE, add.labrows = FALSE)
```

```
## S4 method for signature '`NULL`'
collect_leaves(tt, incl.cont = TRUE, add.labrows = FALSE)
```

```
## S4 method for signature 'ANY'
collect_leaves(tt, incl.cont = TRUE, add.labrows = FALSE)
```

Arguments

tt	TableTree (or related class). A TableTree object representing a populated table.
incl.cont	logical. Include rows from content tables within the tree. Defaults to TRUE
add.labrows	logical. Include label rows. Defaults to FALSE

Value

A list of TableRow objects for all rows in the table

compare_rtables	<i>Compare two rtables</i>
-----------------	----------------------------

Description

Prints a matrix where . means cell matches, X means cell does not match, + cell (row) is missing, and - cell (row) should not be there. If structure is set to TRUE, C indicates columnar structure mismatch, R indicates row-structure mismatch, and S indicates mismatch in both row and column structure.

Usage

```
compare_rtables(
  object,
  expected,
  tol = 0.1,
  comp.attr = TRUE,
  structure = FALSE
)
```

Arguments

object	rtable to test
expected	rtable expected
tol	numerical tolerance
comp.attr	boolean. Compare format of cells. Other attributes are silently ignored.
structure	boolean. Should structure (in the form of column and row paths to cells) be compared. Currently defaults to FALSE, but this is subject to change in future versions.

Value

a matrix of class "rtables_diff" representing the differences between object and expected as described above.

Note

In its current form `compare_rtables` does not take structure into account, only row and cell position.

Examples

```
t1 <- rtable(header = c("A", "B"), format = "xx", rrow("row 1", 1, 2))
t2 <- rtable(header = c("A", "B", "C"), format = "xx", rrow("row 1", 1, 2, 3))

compare_rtables(object = t1, expected = t2)

if(interactive()){
  Viewer(t1, t2)
}

expected <- rtable(
  header = c("ARM A\nN=100", "ARM B\nN=200"),
  format = "xx",
  rrow("row 1", 10, 15),
  rrow(),
  rrow("section title"),
  rrow("row colspan", rcell(c(.345543, .4432423), colspan = 2, format = "(xx.xx, xx.xx)"))
)

expected

object <- rtable(
  header = c("ARM A\nN=100", "ARM B\nN=200"),
  format = "xx",
  rrow("row 1", 10, 15),
  rrow("section title"),
  rrow("row colspan", rcell(c(.345543, .4432423), colspan = 2, format = "(xx.xx, xx.xx)"))
)

compare_rtables(object, expected, comp.attr = FALSE)

object <- rtable(
  header = c("ARM A\nN=100", "ARM B\nN=200"),
  format = "xx",
  rrow("row 1", 10, 15),
  rrow(),
  rrow("section title")
)

compare_rtables(object, expected)

object <- rtable(
  header = c("ARM A\nN=100", "ARM B\nN=200"),
  format = "xx",
  rrow("row 1", 14, 15.03),
  rrow(),
```



```

    rrow("section title"),
    rrow("row colspan", rcell(c(.345543, .4432423), colspan = 2, format = "(xx.xx, xx.xx)"))
  )

compare_rtables(object, expected)

object <- rtable(
  header = c("ARM A\nN=100", "ARM B\nN=200"),
  format = "xx",
  rrow("row 1", 10, 15),
  rrow(),
  rrow("section title"),
  rrow("row colspan", rcell(c(.345543, .4432423), colspan = 2, format = "(xx.x, xx.x)"))
)

compare_rtables(object, expected)

```

compat_args

Compatibility Arg Conventions

Description

Compatibility Arg Conventions

Usage

```

compat_args(
  .lst,
  FUN,
  col_by,
  row_by,
  row.name,
  format,
  indent,
  col_wise_args,
  label
)

```

Arguments

.lst	list. An already-collected list of arguments to be used instead of the elements of ... Arguments passed via ... will be ignored if this is specified.
FUN	function. Tabulation function. Will be passed subsets of x defined by the combination of col_by and row_by and returns corresponding cell value
col_by	(factor or data.frame if a factor of length nrow(x) that defines which levels in col_by define a column.
row_by	rows in x to take per row in the resulting table

row.name	if NULL then the FUN argument is deparsed and used as row.name of the <code>rrow</code>
format	if FUN does not return a formatted <code>rcell</code> then the format is applied
indent	deprecated.
col_wise_args	a named list containing collections (e.g. vectors or lists) with data elements for each column of the resulting table. The data elements are then passed to the named argument FUN corresponding to the element name of the outer list. Hence, the length and order of each collection must match the levels in <code>col_by</code> . See examples.
label	character(1). A label (not to be confused with the name) for the object/structure.

Value

NULL (this is an argument template dummy function)

See Also

Other conventions: `constr_args()`, `gen_args()`, `lyt_args()`, `sf_args()`

constr_args

Constructor Arg Conventions

Description

Constructor Arg Conventions

Usage

```
constr_args(
  kids,
  cont,
  lev,
  iscontent,
  cinfo,
  labelrow,
  vals,
  cspan,
  label_pos,
  cindent_mod,
  cvar,
  label,
  cextra_args,
  child_names,
  title,
  subtitles,
  main_footer,
  prov_footer,
```

```

    footnotes,
    page_title,
    page_prefix
)

```

Arguments

kids	list. List of direct children.
cont	ElementaryTable. Content table.
lev	integer. Nesting level (roughly, indentation level in practical terms).
iscontent	logical. Is the TableTree/ElementaryTable being constructed the content table for another TableTree.
cinfo	InstantiatedColumnInfo (or NULL). Column structure for the object being created.
labelrow	LabelRow. The LabelRow object to assign to this Table. Constructed from label by default if not specified.
vals	list. cell values for the row
cspan	integer. Column span. 1 indicates no spanning.
label_pos	character(1). Location the variable label should be displayed, Accepts hidden (default for non-analyze row splits), visible, topleft, and - for analyze splits only - default. For analyze calls, default indicates that the variable should be visible if and only if multiple variables are analyzed at the same level of nesting.
cindent_mod	numeric(1). The indent modifier for the content tables generated by this split.
cvar	character(1). The variable, if any, which the content function should accept. Defaults to NA.
label	character(1). A label (not to be confused with the name) for the object/structure.
cextra_args	list. Extra arguments to be passed to the content function when tabulating row group summaries.
child_names	character. Names to be given to the sub splits contained by a compound split (typically a AnalyzeMultiVars split object).
title	character(1). Main title. Ignored for subtables.
subtitles	character. Subtitles. Ignored for subtables.
main_footer	character. Main global (non-referential) footer materials.
prov_footer	character. Provenance-related global footer materials. Generally should not be modified by hand.
footnotes	list or NULL. Referential footnotes to be applied at current level
page_title	character. Page specific title(s).
page_prefix	character(1). Prefix, to be appended with the split value, when forcing pagination between the children of this split/table

Value

NULL (this is an argument template dummy function)

See Also

Other conventions: [compat_args\(\)](#), [gen_args\(\)](#), [lyt_args\(\)](#), [sf_args\(\)](#)

content_table	<i>Retrieve or set Content Table from a TableTree</i>
---------------	---

Description

Returns the content table of obj if it is a TableTree object, or NULL otherwise

Usage

```
content_table(obj)

## S4 method for signature 'TableTree'
content_table(obj)

## S4 method for signature 'ANY'
content_table(obj)

content_table(obj) <- value

## S4 replacement method for signature 'TableTree,ElementaryTable'
content_table(obj) <- value
```

Arguments

obj	TableTree. The TableTree
value	ElementaryTable. The new content table for obj.

Value

the ElementaryTable containing the (top level) *content rows* of obj (or NULL if obj is not a formal table object).

cont_n_allcols	<i>Score functions for sorting TableTrees</i>
----------------	---

Description

Score functions for sorting TableTrees

Usage

```
cont_n_allcols(tt)
```

```
cont_n_onecol(j)
```

Arguments

tt TableTree (or related class). A TableTree object representing a populated table.

j numeric(1). Number of column to be scored

Value

A single numeric value indicating score according to the relevant metric for `tt`, to be used when sorting.

custom_split_funs	<i>Custom Split Functions Split functions provide the work-horse for rtables's generalized partitioning. These functions accept a (sub)set of incoming data, a split object, and return 'splits' of that data.</i>
-------------------	--

Description

Custom Split Functions

Split functions provide the work-horse for `rtables`'s generalized partitioning. These functions accept a (sub)set of incoming data, a split object, and return 'splits' of that data.

Custom Splitting Function Details

User-defined custom split functions can perform any type of computation on the incoming data provided that they meet the contract for generating 'splits' of the incoming data 'based on' the split object.

Split functions are functions that accept:

df data.frame of incoming data to be split

spl a Split object. this is largely an internal detail custom functions will not need to worry about, but `obj_name(spl)`, for example, will give the name of the split as it will appear in paths in the resulting table

vals Any pre-calculated values. If given non-null values, the values returned should match these. Should be NULL in most cases and can likely be ignored

labels Any pre-calculated value labels. Same as above for values

trim If TRUE, resulting splits that are empty should be removed

(Optional) .spl_context a data.frame describing previously performed splits which collectively arrived at `df`

The function must then output a named `list` with the following elements:

values The vector of all values corresponding to the splits of `df`

datasplit a list of `data.frame`s representing the groupings of the actual observations from `df`.

labels a character vector giving a string label for each value listed in the `values` element above

(Optional) extras If present, extra arguments to be passed to summary and analysis functions whenever they are executed on the corresponding element of `datasplit` or a subset thereof

One way to generate custom splitting functions is to wrap existing split functions and modify either the incoming data before they are called, or their outputs.

`df_to_tt`

Create ElementaryTable from data.frame

Description

Create `ElementaryTable` from `data.frame`

Usage

```
df_to_tt(df)
```

Arguments

`df` `data.frame`.

Value

an `ElementaryTable` object with unnested columns corresponding to `names(df)` and row labels corresponding to `row.names(df)`

Examples

```
df_to_tt(mtcars)
```

`do_base_split`

Apply Basic Split (For Use In Custom Split Functions)

Description

This function is intended for use inside custom split functions. It applies the current split *as if it had no custom splitting function* so that those default splits can be further manipulated.

Usage

```
do_base_split(spl, df, vals = NULL, labels = NULL, trim = FALSE)
```

Arguments

spl	A Split object defining a partitioning or analysis/tabulation of the data.
df	dataset (data.frame or tibble)
vals	ANY. Already calculated/known values of the split. Generally should be left as NULL.
labels	character. Labels associated with vals. Should be NULL when vals is, which should almost always be the case.
trim	logical(1). Should groups corresponding to empty data subsets be removed. Defaults to FALSE.

Value

the result of the split being applied as if it had no custom split function, see [custom_split_funs](#)

Examples

```
uneven_splfun <-function(df, spl, vals = NULL, labels = NULL, trim = FALSE) {
  ret <- do_base_split(spl, df, vals, labels, trim)
  if(NROW(df) == 0)
    ret <- lapply(ret, function(x) x[1])
  ret
}

lyt <- basic_table() %>%
  split_cols_by("ARM") %>%
  split_cols_by_multivar(c("USUBJID", "AESEQ", "BMRKR1"),
    varlabels = c("N", "E", "BMR1"),
    split_fun = uneven_splfun) %>%
  analyze_colvars(list(USUBJID = function(x, ...) length(unique(x)),
    AESEQ = max,
    BMRKR1 = mean))

build_table(lyt, subset(ex_adae, as.numeric(ARM) <= 2))
```

ElementaryTable-class *TableTree* classes

Description

TableTree classes

Table Constructors and Classes

Usage

```

ElementaryTable(
  kids = list(),
  name = "",
  lev = 1L,
  label = "",
  labelrow = LabelRow(lev = lev, label = label, vis = !isTRUE(iscontent) &&
    !is.na(label) && nzchar(label)),
  rspan = data.frame(),
  cinfo = NULL,
  iscontent = NA,
  var = NA_character_,
  format = NULL,
  indent_mod = 0L,
  title = "",
  subtitles = character(),
  main_footer = character(),
  prov_footer = character(),
  hsep = default_hsep()
)

TableTree(
  kids = list(),
  name = if (!is.na(var)) var else "",
  cont = EmptyElTable,
  lev = 1L,
  label = name,
  labelrow = LabelRow(lev = lev, label = label, vis = nrow(cont) == 0 && !is.na(label)
    && nzchar(label)),
  rspan = data.frame(),
  iscontent = NA,
  var = NA_character_,
  cinfo = NULL,
  format = NULL,
  indent_mod = 0L,
  title = "",
  subtitles = character(),
  main_footer = character(),
  prov_footer = character(),
  page_title = NA_character_,
  hsep = default_hsep()
)

```

Arguments

kids	list. List of direct children.
name	character(1). Name of the split/table/row being created. Defaults to same as the corresponding llabel, but is not required to be.

lev	integer. Nesting level (roughly, indentation level in practical terms).
label	character(1). A label (not to be confused with the name) for the object/structure.
labelrow	LabelRow. The LabelRow object to assign to this Table. Constructed from label by default if not specified.
rspans	data.frame. Currently stored but otherwise ignored.
cinfo	InstantiatedColumnInfo (or NULL). Column structure for the object being created.
iscontent	logical. Is the TableTree/ElementaryTable being constructed the content table for another TableTree.
var	string, variable name
format	FormatSpec. Format associated with this split. Formats can be declared via strings ("xx.x") or function. In cases such as analyze calls, they can character vectors or lists of functions.
indent_mod	numeric. Modifier for the default indent position for the structure created by this function(subtable, content table, or row) <i>and all of that structure's children</i> . Defaults to 0, which corresponds to the unmodified default behavior.
title	character(1). Main title. Ignored for subtables.
subtitles	character. Subtitles. Ignored for subtables.
main_footer	character. Main global (non-referential) footer materials.
prov_footer	character. Provenance-related global footer materials. Generally should not be modified by hand.
hsep	character(1). Set of character(s) to be repeated as the separator between the header and body of the table when rendered as text. Defaults to a connected horizontal line (unicode 2014) in locals that use a UTF charset, and to - elsewhere (with a once per session warning).
cont	ElementaryTable. Content table.
page_title	character. Page specific title(s).

Value

A formal object representing a populated table.

Author(s)

Gabriel Becker

Gabriel Becker

EmptyColInfo

Empty table, column, split objects

Description

Empty objects of various types to compare against efficiently.

 export_as_pdf

Export as PDF

Description

The PDF output is based on the ASCII output created with `toString`

Usage

```
export_as_pdf(
  tt,
  file,
  width = 11.7,
  height = 8.3,
  margins = c(4, 4, 4, 4),
  fontsize = 8,
  paginate = TRUE,
  lpp = NULL,
  hsep = "-",
  indent_size = 2,
  ...
)
```

Arguments

<code>tt</code>	TableTree (or related class). A TableTree object representing a populated table.
<code>file</code>	file to write, must have .pdf extension
<code>width</code>	the width and height of the graphics region in inches
<code>height</code>	the width and height of the graphics region in inches
<code>margins</code>	A numeric vector interpreted in the same way as <code>par(mar)</code> in base graphics.
<code>fontsize</code>	the size of text (in points)
<code>paginate</code>	logical(1). Should <code>tt</code> be paginated before writing the file.
<code>lpp</code>	numeric. Maximum lines per page including (re)printed header and context rows
<code>hsep</code>	character(1). Set of character(s) to be repeated as the separator between the header and body of the table when rendered as text. Defaults to a connected horizontal line (unicode 2014) in locals that use a UTF charset, and to - elsewhere (with a once per session warning).
<code>indent_size</code>	numeric(1). Number of spaces to use per indent level. Defaults to 2
<code>...</code>	arguments passed on to <code>paginate_table</code>

See Also

`export_as_txt`

Examples

```

lyt <- basic_table() %>%
  split_cols_by("ARM") %>%
  analyze(c("AGE", "BMRKR2", "COUNTRY"))

tbl <- build_table(lyt, ex_adsl)

## Not run:
tf <- tempfile(fileext = ".pdf")
export_as_pdf(tbl, file = tf, height = 4)
tf <- tempfile(fileext = ".pdf")
export_as_pdf(tbl, file = tf, lpp = 8)

## End(Not run)

```

export_as_tsv

Create Enriched flat value table with paths

Description

This function creates a flat tabular file of cell values and corresponding paths via [path_enriched_df](#). I then writes that data.frame out as a tsv file.

Usage

```

export_as_tsv(
  tt,
  file = NULL,
  path_fun = collapse_path,
  value_fun = collapse_values
)

import_from_tsv(file)

```

Arguments

tt	TableTree (or related class). A TableTree object representing a populated table.
file	character(1). The path of the file to written to or read from.
path_fun	function. Function to transform paths into single-string row/column names.
value_fun	function. Function to transform cell values into cells of the data.frame. Defaults to collapse_values which creates strings where multi-valued cells are collapsed together, separated by .

Details

By default (ie when value_func is not specified, List columns where at least one value has length > 1 are collapsed to character vectors by collapsing the list element with "|".

Value

NULL silently for `export_as_tsv`, a `data.frame` with re-constituted list values for `export_as_tsv`.

Note

There is currently no round-trip capability for this type of export. You can read values exported this way back in via `import_from_tsv` but you will receive only the `data.frame` version back, NOT a `TableTree`.

<code>export_as_txt</code>	<i>Export as plain text with page break symbol</i>
----------------------------	--

Description

Export as plain text with page break symbol

Usage

```
export_as_txt(
  tt,
  file = NULL,
  paginate = FALSE,
  ...,
  page_break = "\\s\\n",
  hsep = default_hsep(),
  indent_size = 2
)
```

Arguments

<code>tt</code>	TableTree (or related class). A TableTree object representing a populated table.
<code>file</code>	character(1). File to write.
<code>paginate</code>	logical(1). Should <code>tt</code> be paginated before writing the file.
<code>...</code>	Passed directly to paginate_table
<code>page_break</code>	character(1). Page break symbol (defaults to outputting " <code>\s</code> ").
<code>hsep</code>	character(1). Set of character(s) to be repeated as the separator between the header and body of the table when rendered as text. Defaults to a connected horizontal line (unicode 2014) in locals that use a UTF charset, and to <code>-</code> elsewhere (with a once per session warning).
<code>indent_size</code>	numeric(1). Number of spaces to use per indent level. Defaults to 2

Value

`file` (this function is called for the side effect of writing the file).

See Also

export_as_pdf

Examples

```

lyt <- basic_table() %>%
  split_cols_by("ARM") %>%
  analyze(c("AGE", "BMRKR2", "COUNTRY"))

tbl <- build_table(lyt, ex_adsl)

cat(export_as_txt(tbl, file = NULL, paginate = TRUE, lpp = 8))

## Not run:
tf <- tempfile(fileext = ".txt")
export_as_txt(tbl, file = tf)
system2("cat", tf)

## End(Not run)

```

format_rcell

*Format rcell***Description**

This is a wrapper around `formatters::format_value` for use with `CellValue` objects

Usage

```

format_rcell(
  x,
  format,
  output = c("ascii", "html"),
  na_str = obj_na_str(x) %||% "NA"
)

```

Arguments

<code>x</code>	an object of class <code>CellValue</code> , or a raw value.
<code>format</code>	character(1) or function. The format label (string) or formatter function to apply to <code>x</code> .
<code>output</code>	character(1). output type
<code>na_str</code>	character(1). String that should be displayed when the value of <code>x</code> is missing. Defaults to "NA".

Value

formatted text representing the cell

Examples

```
c11 <- CellValue(pi, format = "xx.xxx")
format_rcell(c11)
```

gen_args

General Argument Conventions

Description

General Argument Conventions

Usage

```
gen_args(  
  df,  
  alt_counts_df,  
  spl,  
  pos,  
  tt,  
  tr,  
  verbose,  
  colwidths,  
  obj,  
  x,  
  value,  
  object,  
  path,  
  label,  
  label_pos,  
  cvar,  
  topleft,  
  page_prefix,  
  hsep,  
  indent_size,  
  ...  
)
```

Arguments

df dataset (data.frame or tibble)

alt_counts_df dataset (data.frame or tibble). Alternative full data the rtables framework will use (*only*) when calculating column counts.

spl	A Split object defining a partitioning or analysis/tabulation of the data.
pos	numeric. Which top-level set of nested splits should the new layout feature be added to. Defaults to the current
tt	TableTree (or related class). A TableTree object representing a populated table.
tr	TableRow (or related class). A TableRow object representing a single row within a populated table.
verbose	logical(1). Should extra debugging messages be shown. Defaults to FALSE.
colwidths	numeric vector. Column widths for use with vertical pagination. Currently ignored.
obj	ANY. The object for the accessor to access or modify
x	An object
value	The new value
object	The object to modify in-place
path	character. A vector path for a position within the structure of a tabletree. Each element represents a subsequent choice amongst the children of the previous choice.
label	character(1). A label (not to be confused with the name) for the object/structure.
label_pos	character(1). Location the variable label should be displayed, Accepts hidden (default for non-analyze row splits), visible, topleft, and - for analyze splits only - default. For analyze calls, default indicates that the variable should be visible if and only if multiple variables are analyzed at the same level of nesting.
cvar	character(1). The variable, if any, which the content function should accept. Defaults to NA.
topleft	character. Override values for the "top left" material to be displayed during printing.
page_prefix	character(1). Prefix, to be appended with the split value, when forcing pagination between the children of this split/table
hsep	character(1). Set of character(s) to be repeated as the separator between the header and body of the table when rendered as text. Defaults to a connected horizontal line (unicode 2014) in locals that use a UTF charset, and to - elsewhere (with a once per session warning).
indent_size	numeric(1). Number of spaces to use per indent level. Defaults to 2
...	Passed on to methods or tabulation functions.

Value

NULL (this is an argument template dummy function)

See Also

Other conventions: [compat_args\(\)](#), [constr_args\(\)](#), [lyt_args\(\)](#), [sf_args\(\)](#)

get_formatted_cells *get formatted cells*

Description

get formatted cells

Usage

```
get_formatted_cells(obj, shell = FALSE)

## S4 method for signature 'TableTree'
get_formatted_cells(obj, shell = FALSE)

## S4 method for signature 'ElementaryTable'
get_formatted_cells(obj, shell = FALSE)

## S4 method for signature 'TableRow'
get_formatted_cells(obj, shell = FALSE)

## S4 method for signature 'LabelRow'
get_formatted_cells(obj, shell = FALSE)

get_cell_aligns(obj)

## S4 method for signature 'TableTree'
get_cell_aligns(obj)

## S4 method for signature 'ElementaryTable'
get_cell_aligns(obj)

## S4 method for signature 'TableRow'
get_cell_aligns(obj)

## S4 method for signature 'LabelRow'
get_cell_aligns(obj)
```

Arguments

obj	ANY. The object for the accessor to access or modify
shell	logical(1). Should the formats themselves be returned instead of the values with formats applied. Defaults to FALSE.

Value

the formatted print-strings for all (body) cells in obj.

Examples

```

library(dplyr)

iris2 <- iris %>%
  group_by(Species) %>%
  mutate(group = as.factor(rep_len(c("a", "b"), length.out = n()))) %>%
  ungroup()

tbl <- basic_table() %>%
  split_cols_by("Species") %>%
  split_cols_by("group") %>%
  analyze(c("Sepal.Length", "Petal.Width"), afun = list_wrap_x(summary) , format = "xx.xx") %>%
  build_table(iris2)

get_formatted_cells(tbl)

```

horizontal_sep	<i>Access or recursively set header-body separator for tables</i>
----------------	---

Description

Access or recursively set header-body separator for tables

Usage

```

horizontal_sep(obj)

## S4 method for signature 'VTableTree'
horizontal_sep(obj)

horizontal_sep(obj) <- value

## S4 replacement method for signature 'VTableTree'
horizontal_sep(obj) <- value

## S4 replacement method for signature 'TableRow'
horizontal_sep(obj) <- value

```

Arguments

obj	ANY. The object for the accessor to access or modify
value	character(1). String to use as new header/body separator.

Value

for horizontal_sep the string acting as the header separator. for horizontal_sep<-, the obj, with the new header separator applied recursively to it and all its subtables.

indent

Change indentation of all rows in an rtable

Description

Change indentation of all rows in an rtable

Usage

```
indent(x, by = 1)
```

Arguments

x [rtable](#) object

by integer to increase indentation of rows. Can be negative. If final indentation is smaller than 0 then the indentation is set to 0.

Value

x with its indent modifier incremented by by.

Examples

```
is_setosa <- iris$Species == "setosa"
mtbl <- rtable(
  header = rheader(
    row(row.name = NULL, rcell("Sepal.Length", colspan = 2), rcell("Petal.Length", colspan=2)),
    rrow(NULL, "mean", "median", "mean", "median")
  ),
  rrow(
    row.name = "All Species",
    mean(iris$Sepal.Length), median(iris$Sepal.Length),
    mean(iris$Petal.Length), median(iris$Petal.Length),
    format = "xx.xx"
  ),
  rrow(
    row.name = "Setosa",
    mean(iris$Sepal.Length[is_setosa]), median(iris$Sepal.Length[is_setosa]),
    mean(iris$Petal.Length[is_setosa]), median(iris$Petal.Length[is_setosa]),
    format = "xx.xx"
  )
)
indent(mtbl)
indent(mtbl, 2)
```

indent_string	<i>Indent Strings</i>
---------------	-----------------------

Description

Used in rtables to indent row names for the ASCII output.

Usage

```
indent_string(x, indent = 0, incr = 2, including_newline = TRUE)
```

Arguments

x	a character vector
indent	a vector of length length(x) with non-negative integers
incr	non-negative integer: number of spaces per indent level
including_newline	boolean: should newlines also be indented

Value

x indented by left-padding with codeindent*incr white-spaces.

Examples

```
indent_string("a", 0)
indent_string("a", 1)
indent_string(letters[1:3], 0:2)
indent_string(paste0(letters[1:3], "\n", LETTERS[1:3]), 0:2)
```

insert_row_at_path	<i>Insert Row at Path</i>
--------------------	---------------------------

Description

Insert a row into an existing table directly before or directly after an existing data (i.e., non-content and non-label) row, specified by its path.

Usage

```
insert_row_at_path(tt, path, value, after = FALSE)
```

```
## S4 method for signature 'VTableTree,DataRow'
insert_row_at_path(tt, path, value, after = FALSE)
```

```
## S4 method for signature 'VTableTree,ANY'
insert_row_at_path(tt, path, value)
```

Arguments

tt	TableTree (or related class). A TableTree object representing a populated table.
path	character. A vector path for a position within the structure of a tabletree. Each element represents a subsequent choice amongst the children of the previous choice.
value	The new value
after	logical(1). Should value be added as a row directly before (FALSE, the default) or after (TRUE) the row specified by path.

See Also

DataRow rrow

Examples

```
lyt <- basic_table() %>%
  split_rows_by("COUNTRY", split_fun = keep_split_levels(c("CHN", "USA"))) %>%
  analyze("AGE")

tab <- build_table(lyt, DM)

tab2 <- insert_row_at_path(tab, c("COUNTRY", "CHN", "AGE", "Mean"),
  rrow("new row", 555))

tab2
tab2 <- insert_row_at_path(tab2, c("COUNTRY", "CHN", "AGE", "Mean"),
  rrow("new row redux", 888),
  after = TRUE)

tab2
```

insert_rrow

[DEPRECATED] insert rrows at (before) a specific location

Description

This function is deprecated and will be removed in a future release of rtables. Please use [insert_row_at_path](#) or [label_at_path](#) instead.

Usage

```
insert_rrow(tbl, rrow, at = 1, ascentent = FALSE)
```

Arguments

tbl	rtable
rrow	rrow to append to rtable
at	position into which to put the rrow, defaults to beginning (ie 1)
ascentent	logical. Currently ignored.

Value

A TableTree of the same specific class as tbl

Note

Label rows (ie a row with no data values, only a row.name) can only be inserted at positions which do not already contain a label row when there is a non-trivial nested row structure in tbl

Examples

```
o <- options(warn = 0)
tbl <- basic_table() %>%
  split_cols_by("Species") %>%
  analyze("Sepal.Length") %>%
  build_table(iris)

insert_rrow(tbl, rrow("Hello World"))
insert_rrow(tbl, rrow("Hello World"), at = 2)

tbl2 <- basic_table() %>%
  split_cols_by("Species") %>%
  split_rows_by("Species") %>%
  analyze("Sepal.Length") %>%
  build_table(iris)

insert_rrow(tbl2, rrow("Hello World"))
insert_rrow(tbl2, rrow("Hello World"), at = 2)
insert_rrow(tbl2, rrow("Hello World"), at = 4)

insert_rrow(tbl2, rrow("new row", 5, 6, 7))

insert_rrow(tbl2, rrow("new row", 5, 6, 7), at = 3)

options(o)
```

InstantiatedColumnInfo-class

InstantiatedColumnInfo

Description

InstantiatedColumnInfo

Usage

```
InstantiatedColumnInfo(
  treelyt = LayoutColTree(),
  csubs = list(expression(TRUE)),
  extras = list(list()),
```

```

cnts = NA_integer_,
total_cnt = NA_integer_,
dispcounts = FALSE,
countformat = "(N=xx)",
topleft = character()
)

```

Arguments

treelyt	LayoutColTree.
csubs	list. List of subsetting expressions
extras	list. Extra arguments associated with the columns
cnts	integer. Counts.
total_cnt	integer(1). Total observations represented across all columns.
dispcounts	logical. Should the counts be displayed as header info when the associated table is printed.
countformat	string. Format for the counts if they are displayed
topleft	character. Override values for the "top left" material to be displayed during printing.

Value

an InstantiateColumnInfo object.

internal_methods	<i>combine SplitVector objects</i>
------------------	------------------------------------

Description

These are internal methods that are documented only to satisfy R CMD check. End users should pay no attention to this documentation.

Usage

```

## S4 method for signature 'SplitVector'
c(x, ...)

split_rows(lyt = NULL, spl, pos, cmpnd_fun = AnalyzeMultiVars)

## S4 method for signature '`NULL`'
split_rows(lyt = NULL, spl, pos, cmpnd_fun = AnalyzeMultiVars)

## S4 method for signature 'PreDataRowLayout'
split_rows(lyt = NULL, spl, pos, cmpnd_fun = AnalyzeMultiVars)

```

```
## S4 method for signature 'SplitVector'  
split_rows(lyt = NULL, spl, pos, cmpnd_fun = AnalyzeMultiVars)  
  
## S4 method for signature 'PreDataTableLayouts'  
split_rows(lyt, spl, pos)  
  
## S4 method for signature 'ANY'  
split_rows(lyt, spl, pos)  
  
cmpnd_last_rowsplit(lyt, spl, constructor)  
  
## S4 method for signature ``NULL``  
cmpnd_last_rowsplit(lyt, spl, constructor)  
  
## S4 method for signature 'PreDataRowLayout'  
cmpnd_last_rowsplit(lyt, spl, constructor)  
  
## S4 method for signature 'SplitVector'  
cmpnd_last_rowsplit(lyt, spl, constructor)  
  
## S4 method for signature 'PreDataTableLayouts'  
cmpnd_last_rowsplit(lyt, spl, constructor)  
  
## S4 method for signature 'ANY'  
cmpnd_last_rowsplit(lyt, spl, constructor)  
  
split_cols(lyt = NULL, spl, pos)  
  
## S4 method for signature ``NULL``  
split_cols(lyt = NULL, spl, pos)  
  
## S4 method for signature 'PreDataColLayout'  
split_cols(lyt = NULL, spl, pos)  
  
## S4 method for signature 'SplitVector'  
split_cols(lyt = NULL, spl, pos)  
  
## S4 method for signature 'PreDataTableLayouts'  
split_cols(lyt = NULL, spl, pos)  
  
## S4 method for signature 'ANY'  
split_cols(lyt = NULL, spl, pos)  
  
.add_row_summary(  
  lyt,  
  label,  
  cfun,  
  child_labels = c("default", "visible", "hidden"),
```

```
cformat = NULL,  
indent_mod = 0L,  
cvar = "",  
extra_args = list()  
)  
  
## S4 method for signature 'PreDataTableLayouts'  
.add_row_summary(  
  lyt,  
  label,  
  cfun,  
  child_labels = c("default", "visible", "hidden"),  
  cformat = NULL,  
  indent_mod = 0L,  
  cvar = "",  
  extra_args = list()  
)  
  
## S4 method for signature 'PreDataRowLayout'  
.add_row_summary(  
  lyt,  
  label,  
  cfun,  
  child_labels = c("default", "visible", "hidden"),  
  cformat = NULL,  
  indent_mod = 0L,  
  cvar = "",  
  extra_args = list()  
)  
  
## S4 method for signature 'SplitVector'  
.add_row_summary(  
  lyt,  
  label,  
  cfun,  
  child_labels = c("default", "visible", "hidden"),  
  cformat = NULL,  
  indent_mod = 0L,  
  cvar = "",  
  extra_args = list()  
)  
  
## S4 method for signature 'Split'  
.add_row_summary(  
  lyt,  
  label,  
  cfun,  
  child_labels = c("default", "visible", "hidden"),
```



```
    cformat = NULL,  
    indent_mod = 0L,  
    cvar = "",  
    extra_args = list()  
  )  
  
  fix_dyncuts(spl, df)  
  
  ## S4 method for signature 'Split'  
  fix_dyncuts(spl, df)  
  
  ## S4 method for signature 'VarDynCutSplit'  
  fix_dyncuts(spl, df)  
  
  ## S4 method for signature 'VTableTree'  
  fix_dyncuts(spl, df)  
  
  ## S4 method for signature 'PreDataRowLayout'  
  fix_dyncuts(spl, df)  
  
  ## S4 method for signature 'PreDataColLayout'  
  fix_dyncuts(spl, df)  
  
  ## S4 method for signature 'SplitVector'  
  fix_dyncuts(spl, df)  
  
  ## S4 method for signature 'PreDataTableLayouts'  
  fix_dyncuts(spl, df)  
  
  summarize_rows_inner(obj, depth = 0, indent = 0)  
  
  ## S4 method for signature 'TableTree'  
  summarize_rows_inner(obj, depth = 0, indent = 0)  
  
  ## S4 method for signature 'ElementaryTable'  
  summarize_rows_inner(obj, depth = 0, indent = 0)  
  
  ## S4 method for signature 'TableRow'  
  summarize_rows_inner(obj, depth = 0, indent = 0)  
  
  ## S4 method for signature 'LabelRow'  
  summarize_rows_inner(obj, depth = 0, indent = 0)  
  
  table_structure_inner(obj, depth = 0, indent = 0, print_indent = 0)  
  
  ## S4 method for signature 'TableTree'  
  table_structure_inner(obj, depth = 0, indent = 0, print_indent = 0)
```

```
## S4 method for signature 'ElementaryTable'
table_structure_inner(obj, depth = 0, indent = 0, print_indent = 0)

## S4 method for signature 'TableRow'
table_structure_inner(obj, depth = 0, indent = 0, print_indent = 0)

## S4 method for signature 'LabelRow'
table_structure_inner(obj, depth = 0, indent = 0, print_indent = 0)

next_rpos(obj, nested = TRUE, for_analyze = FALSE)

## S4 method for signature 'PreDataTableLayouts'
next_rpos(obj, nested = TRUE, for_analyze = FALSE)

## S4 method for signature 'PreDataRowLayout'
next_rpos(obj, nested = TRUE, for_analyze = FALSE)

## S4 method for signature 'ANY'
next_rpos(obj, nested)

next_cpos(obj, nested = TRUE)

## S4 method for signature 'PreDataTableLayouts'
next_cpos(obj, nested = TRUE)

## S4 method for signature 'PreDataColLayout'
next_cpos(obj, nested = TRUE)

## S4 method for signature 'ANY'
next_cpos(obj, nested = TRUE)

last_rowsplit(obj)

## S4 method for signature '`NULL`'
last_rowsplit(obj)

## S4 method for signature 'SplitVector'
last_rowsplit(obj)

## S4 method for signature 'PreDataRowLayout'
last_rowsplit(obj)

## S4 method for signature 'PreDataTableLayouts'
last_rowsplit(obj)

rlayout(obj)

## S4 method for signature 'PreDataTableLayouts'
```

```
rlayout(obj)

## S4 method for signature 'ANY'
rlayout(obj)

rlayout(object) <- value

## S4 replacement method for signature 'PreDataTableLayouts'
rlayout(object) <- value

tree_pos(obj)

## S4 method for signature 'VLayoutNode'
tree_pos(obj)

pos_subset(obj)

## S4 method for signature 'TreePos'
pos_subset(obj)

## S4 method for signature 'VLayoutNode'
pos_subset(obj)

pos_splits(obj)

## S4 method for signature 'TreePos'
pos_splits(obj)

## S4 method for signature 'VLayoutNode'
pos_splits(obj)

pos_splvals(obj)

## S4 method for signature 'TreePos'
pos_splvals(obj)

## S4 method for signature 'VLayoutNode'
pos_splvals(obj)

pos_splval_labels(obj)

## S4 method for signature 'TreePos'
pos_splval_labels(obj)

spl_payload(obj)

## S4 method for signature 'Split'
spl_payload(obj)
```

```
spl_payload(obj) <- value

## S4 replacement method for signature 'Split'
spl_payload(obj) <- value

spl_label_var(obj)

## S4 method for signature 'VarLevelSplit'
spl_label_var(obj)

## S4 method for signature 'Split'
spl_label_var(obj)

tt_labelrow(obj)

## S4 method for signature 'VTableTree'
tt_labelrow(obj)

tt_labelrow(obj) <- value

## S4 replacement method for signature 'VTableTree,LabelRow'
tt_labelrow(obj) <- value

labelrow_visible(obj)

## S4 method for signature 'VTableTree'
labelrow_visible(obj)

## S4 method for signature 'LabelRow'
labelrow_visible(obj)

## S4 method for signature 'VAnalyzeSplit'
labelrow_visible(obj)

labelrow_visible(obj) <- value

## S4 replacement method for signature 'VTableTree'
labelrow_visible(obj) <- value

## S4 replacement method for signature 'LabelRow'
labelrow_visible(obj) <- value

## S4 replacement method for signature 'VAnalyzeSplit'
labelrow_visible(obj) <- value

label_kids(spl)
```

```
## S4 method for signature 'Split'
label_kids(spl)

label_kids(spl) <- value

## S4 replacement method for signature 'Split,character'
label_kids(spl) <- value

## S4 replacement method for signature 'Split,logical'
label_kids(spl) <- value

vis_label(spl)

## S4 method for signature 'Split'
vis_label(spl)

label_position(spl)

## S4 method for signature 'Split'
label_position(spl)

## S4 method for signature 'VAnalyzeSplit'
label_position(spl)

label_position(spl) <- value

## S4 replacement method for signature 'Split'
label_position(spl) <- value

content_fun(obj)

## S4 method for signature 'Split'
content_fun(obj)

content_fun(object) <- value

## S4 replacement method for signature 'Split'
content_fun(object) <- value

analysis_fun(obj)

## S4 method for signature 'AnalyzeVarSplit'
analysis_fun(obj)

## S4 method for signature 'AnalyzeColVarSplit'
analysis_fun(obj)

split_fun(obj)
```

```
## S4 method for signature 'CustomizableSplit'
split_fun(obj)

## S4 method for signature 'Split'
split_fun(obj)

split_fun(obj) <- value

## S4 replacement method for signature 'CustomizableSplit'
split_fun(obj) <- value

## S4 replacement method for signature 'Split'
split_fun(obj) <- value

content_extra_args(obj)

## S4 method for signature 'Split'
content_extra_args(obj)

content_extra_args(object) <- value

## S4 replacement method for signature 'Split'
content_extra_args(object) <- value

content_var(obj)

## S4 method for signature 'Split'
content_var(obj)

content_var(object) <- value

## S4 replacement method for signature 'Split'
content_var(object) <- value

avar_inclNAs(obj)

## S4 method for signature 'VAnalyzeSplit'
avar_inclNAs(obj)

avar_inclNAs(obj) <- value

## S4 replacement method for signature 'VAnalyzeSplit'
avar_inclNAs(obj) <- value

spl_labelvar(obj)

## S4 method for signature 'VarLevelSplit'
```

```
spl_labelvar(obj)

spl_child_order(obj)

## S4 method for signature 'VarLevelSplit'
spl_child_order(obj)

spl_child_order(obj) <- value

## S4 replacement method for signature 'VarLevelSplit'
spl_child_order(obj) <- value

## S4 method for signature 'ManualSplit'
spl_child_order(obj)

## S4 method for signature 'MultiVarSplit'
spl_child_order(obj)

## S4 method for signature 'AllSplit'
spl_child_order(obj)

## S4 method for signature 'VarStaticCutSplit'
spl_child_order(obj)

root_spl(obj)

## S4 method for signature 'PreDataAxisLayout'
root_spl(obj)

root_spl(obj) <- value

## S4 replacement method for signature 'PreDataAxisLayout'
root_spl(obj) <- value

spanned_values(obj)

## S4 method for signature 'TableRow'
spanned_values(obj)

## S4 method for signature 'LabelRow'
spanned_values(obj)

spanned_cells(obj)

## S4 method for signature 'TableRow'
spanned_cells(obj)

## S4 method for signature 'LabelRow'
```

```
spanned_cells(obj)

spanned_values(obj) <- value

## S4 replacement method for signature 'TableRow'
spanned_values(obj) <- value

## S4 replacement method for signature 'LabelRow'
spanned_values(obj) <- value

set_format_recursive(obj, format, override = FALSE)

## S4 method for signature 'TableRow'
set_format_recursive(obj, format, override = FALSE)

## S4 method for signature 'LabelRow'
set_format_recursive(obj, format, override = FALSE)

content_format(obj)

## S4 method for signature 'Split'
content_format(obj)

content_format(obj) <- value

## S4 replacement method for signature 'Split'
content_format(obj) <- value

row_cspans(obj)

## S4 method for signature 'TableRow'
row_cspans(obj)

## S4 method for signature 'LabelRow'
row_cspans(obj)

row_cspans(obj) <- value

## S4 replacement method for signature 'TableRow'
row_cspans(obj) <- value

## S4 replacement method for signature 'LabelRow'
row_cspans(obj) <- value

cell_cspan(obj)

## S4 method for signature 'CellValue'
cell_cspan(obj)
```



```
cell_cspan(obj) <- value

## S4 replacement method for signature 'CellValue'
cell_cspan(obj) <- value

cell_align(obj)

## S4 method for signature 'CellValue'
cell_align(obj)

cell_align(obj) <- value

## S4 replacement method for signature 'CellValue'
cell_align(obj) <- value

tt_level(obj)

## S4 method for signature 'VNodeInfo'
tt_level(obj)

tt_level(obj) <- value

## S4 replacement method for signature 'VNodeInfo'
tt_level(obj) <- value

## S4 replacement method for signature 'VTableTree'
tt_level(obj) <- value

indent_mod(obj)

## S4 method for signature 'Split'
indent_mod(obj)

## S4 method for signature 'VTableNodeInfo'
indent_mod(obj)

## S4 method for signature 'ANY'
indent_mod(obj)

## S4 method for signature 'RowsVerticalSection'
indent_mod(obj)

indent_mod(obj) <- value

## S4 replacement method for signature 'Split'
indent_mod(obj) <- value
```

```
## S4 replacement method for signature 'VTableNodeInfo'
indent_mod(obj) <- value

## S4 replacement method for signature 'CellValue'
indent_mod(obj) <- value

## S4 replacement method for signature 'RowsVerticalSection'
indent_mod(obj) <- value

content_indent_mod(obj)

## S4 method for signature 'Split'
content_indent_mod(obj)

## S4 method for signature 'VTableNodeInfo'
content_indent_mod(obj)

content_indent_mod(obj) <- value

## S4 replacement method for signature 'Split'
content_indent_mod(obj) <- value

## S4 replacement method for signature 'VTableNodeInfo'
content_indent_mod(obj) <- value

rawvalues(obj)

## S4 method for signature 'ValueWrapper'
rawvalues(obj)

## S4 method for signature 'LevelComboSplitValue'
rawvalues(obj)

## S4 method for signature 'list'
rawvalues(obj)

## S4 method for signature 'ANY'
rawvalues(obj)

## S4 method for signature 'CellValue'
rawvalues(obj)

## S4 method for signature 'TreePos'
rawvalues(obj)

## S4 method for signature 'RowsVerticalSection'
rawvalues(obj)
```

```
value_names(obj)

## S4 method for signature 'ANY'
value_names(obj)

## S4 method for signature 'TreePos'
value_names(obj)

## S4 method for signature 'list'
value_names(obj)

## S4 method for signature 'ValueWrapper'
value_names(obj)

## S4 method for signature 'LevelComboSplitValue'
value_names(obj)

## S4 method for signature 'RowsVerticalSection'
value_names(obj)

value_labels(obj)

## S4 method for signature 'ANY'
value_labels(obj)

## S4 method for signature 'TreePos'
value_labels(obj)

## S4 method for signature 'list'
value_labels(obj)

## S4 method for signature 'RowsVerticalSection'
value_labels(obj)

## S4 method for signature 'ValueWrapper'
value_labels(obj)

## S4 method for signature 'LevelComboSplitValue'
value_labels(obj)

## S4 method for signature 'MultiVarSplit'
value_labels(obj)

spl_varlabels(obj)

## S4 method for signature 'MultiVarSplit'
spl_varlabels(obj)
```

```
spl_varlabels(object) <- value

## S4 replacement method for signature 'MultiVarSplit'
spl_varlabels(object) <- value

splv_extra(obj)

## S4 method for signature 'SplitValue'
splv_extra(obj)

splv_extra(obj) <- value

## S4 replacement method for signature 'SplitValue'
splv_extra(obj) <- value

split_exargs(obj)

## S4 method for signature 'Split'
split_exargs(obj)

split_exargs(obj) <- value

## S4 replacement method for signature 'Split'
split_exargs(obj) <- value

col_extra_args(obj, df = NULL)

## S4 method for signature 'InstantiatedColumnInfo'
col_extra_args(obj, df = NULL)

## S4 method for signature 'PreDataTableLayouts'
col_extra_args(obj, df = NULL)

## S4 method for signature 'PreDataColLayout'
col_extra_args(obj, df = NULL)

## S4 method for signature 'LayoutColTree'
col_extra_args(obj, df = NULL)

## S4 method for signature 'LayoutColLeaf'
col_extra_args(obj, df = NULL)

disp_ccounts(obj)

## S4 method for signature 'VTableTree'
disp_ccounts(obj)

## S4 method for signature 'InstantiatedColumnInfo'
```

```
disp_ccounts(obj)

## S4 method for signature 'PreDataTableLayouts'
disp_ccounts(obj)

## S4 method for signature 'PreDataColLayout'
disp_ccounts(obj)

disp_ccounts(obj) <- value

## S4 replacement method for signature 'VTableTree'
disp_ccounts(obj) <- value

## S4 replacement method for signature 'InstantiatedColumnInfo'
disp_ccounts(obj) <- value

## S4 replacement method for signature 'PreDataColLayout'
disp_ccounts(obj) <- value

## S4 replacement method for signature 'LayoutColTree'
disp_ccounts(obj) <- value

## S4 replacement method for signature 'PreDataTableLayouts'
disp_ccounts(obj) <- value

colcount_format(obj)

## S4 method for signature 'InstantiatedColumnInfo'
colcount_format(obj)

## S4 method for signature 'VTableNodeInfo'
colcount_format(obj)

## S4 method for signature 'PreDataColLayout'
colcount_format(obj)

## S4 method for signature 'PreDataTableLayouts'
colcount_format(obj)

colcount_format(obj) <- value

## S4 replacement method for signature 'InstantiatedColumnInfo'
colcount_format(obj) <- value

## S4 replacement method for signature 'VTableNodeInfo'
colcount_format(obj) <- value

## S4 replacement method for signature 'PreDataColLayout'
```

```
colcount_format(obj) <- value

## S4 replacement method for signature 'PreDataTableLayouts'
colcount_format(obj) <- value

spl_cuts(obj)

## S4 method for signature 'VarStaticCutSplit'
spl_cuts(obj)

spl_cutlabels(obj)

## S4 method for signature 'VarStaticCutSplit'
spl_cutlabels(obj)

spl_cutfun(obj)

## S4 method for signature 'VarDynCutSplit'
spl_cutfun(obj)

spl_cutlabelfun(obj)

## S4 method for signature 'VarDynCutSplit'
spl_cutlabelfun(obj)

spl_is_cmlcuts(obj)

## S4 method for signature 'VarDynCutSplit'
spl_is_cmlcuts(obj)

spl_varnames(obj)

## S4 method for signature 'MultiVarSplit'
spl_varnames(obj)

spl_varnames(object) <- value

## S4 replacement method for signature 'MultiVarSplit'
spl_varnames(object) <- value

## S4 method for signature 'VTableTree'
print(x, ...)

## S4 method for signature 'VTableTree'
show(object)
```

Arguments

x The object.

...	Splits or SplitVector objects
lyt	layout object pre-data used for tabulation
spl	Split. The split.
pos	numeric(1). Intended for internal use.
cmpnd_fun	function. Intended for internal use.
constructor	function.
label	character(1). A label (not to be confused with the name) for the object/structure.
cfun	list/function/NULL. tabulation function(s) for creating content rows. Must accept x or df as first parameter. Must accept labelstr as the second argument. Can optionally accept all optional arguments accepted by analysis functions. See analyze .
child_labels	string. One of "default", "visible", "hidden". What should the display behavior be for the labels (ie label rows) of the children of this split. Defaults to "default" which flags the label row as visible only if the child has 0 content rows.
cformat	format spec. Format for content rows
indent_mod	numeric. Modifier for the default indent position for the structure created by this function(subtable, content table, or row) <i>and all of that structure's children</i> . Defaults to 0, which corresponds to the unmodified default behavior.
cvar	character(1). The variable, if any, which the content function should accept. Defaults to NA.
extra_args	list. Extra arguments to be passed to the tabulation function. Element position in the list corresponds to the children of this split. Named elements in the child-specific lists are ignored if they do not match a formal argument of the tabulation function.
df	dataset (data.frame or tibble)
obj	The object.
depth	depth in tree
indent	indent
print_indent	indent for print
nested	boolean. Should this layout instruction be applied within the existing layout structure <i>if possible</i> (TRUE, the default) or as a new top-level element ('FALSE'). Ignored if it would nest a split underneath analyses, which is not allowed.
for_analyze	logical(1).
object	The object to modify in-place
value	The new value
format	FormatSpec. Format associated with this split. Formats can be declared via strings ("xx.x") or function. In cases such as analyze calls, they can character vectors or lists of functions.
override	logical(1).

Value

Various, but should be considered implementation details.

Examples

```
library(dplyr)

iris2 <- iris %>%
  group_by(Species) %>%
  mutate(group = as.factor(rep_len(c("a", "b"), length.out = n())) %>%
    ungroup())

l <- basic_table() %>%
  split_cols_by("Species") %>%
  split_cols_by("group") %>%
  analyze(c("Sepal.Length", "Petal.Width"), afun = list_wrap_x(summary) , format = "xx.xx")

tbl <- build_table(l, iris2)

summarize_rows(tbl)
indent_mod(tbl)
indent_mod(tbl) <- 1L
tbl
```

in_rows

Create multiple rows in analysis or summary functions

Description

define the cells that get placed into multiple rows in afun

Usage

```
in_rows(
  ...,
  .list = NULL,
  .names = NULL,
  .labels = NULL,
  .formats = NULL,
  .indent_mods = NULL,
  .cell_footnotes = list(NULL),
  .row_footnotes = list(NULL),
  .aligns = NULL,
  .format_na_strs = NULL
)
```


Arguments

<code>...</code>	single row defining expressions
<code>.list</code>	list. list cell content, usually <code>rcells</code> , the <code>.list</code> is concatenated to <code>...</code>
<code>.names</code>	character or NULL. Names of the returned list/structure.
<code>.labels</code>	character or NULL. labels for the defined rows
<code>.formats</code>	character or NULL. Formats for the values
<code>.indent_mods</code>	integer or NULL. Indent modifications for the defined rows.
<code>.cell_footnotes</code>	list. Referential footnote messages to be associated by name with <i>cells</i>
<code>.row_footnotes</code>	list. Referential footnotes messages to be associated by name with <i>rows</i>
<code>.aligns</code>	character or NULL. Alignments for the cells
<code>.format_na_strs</code>	character or NULL. NA strings for the cells

Value

an `RowsVerticalSection` object (or NULL). The details of this object should be considered an internal implementation detail.

See Also

`analyze`

Examples

```
in_rows(1, 2, 3, .names = c("a", "b", "c"))
in_rows(1, 2, 3, .labels = c("a", "b", "c"))
in_rows(1, 2, 3, .names = c("a", "b", "c"), .labels = c("AAA", "BBB", "CCC"))

in_rows(.list = list(a = 1, b = 2, c = 3))
in_rows(1, 2, .list = list(3), .names = c("a", "b", "c"))

basic_table() %>%
  split_cols_by("ARM") %>%
  analyze("AGE", afun = function(x) {
    in_rows(
      "Mean (sd)" = rcell(c(mean(x), sd(x)), format = "xx.xx (xx.xx)"),
      "Range" = rcell(range(x), format = "xx.xx - xx.xx")
    )
  }) %>%
  build_table(ex_adsl)
```

is_rtable	<i>Check if an object is a valid rtable</i>
-----------	---

Description

Check if an object is a valid rtable

Usage

```
is_rtable(x)
```

Arguments

x an object

Value

TRUE if x is a formal Table object, FALSE otherwise.

Examples

```
is_rtable(build_table(basic_table(), iris))
```

LabelRow	<i>Row classes and constructors</i>
----------	-------------------------------------

Description

Row classes and constructors

Row constructors and Classes

Usage

```
LabelRow(
  lev = 1L,
  label = "",
  name = label,
  vis = !is.na(label) && nzchar(label),
  cinfo = EmptyColInfo,
  indent_mod = 0L
)

.tablerow(
  vals = list(),
  name = "",
  lev = 1L,
```

```

    label = name,
    cspan = rep(1L, length(vals)),
    cinfo = EmptyColumnInfo,
    var = NA_character_,
    format = NULL,
    klass,
    indent_mod = 0L,
    footnotes = list()
)

```

```
DataRow(...)
```

```
ContentRow(...)
```

Arguments

lev	integer. Nesting level (roughly, indentation level in practical terms).
label	character(1). A label (not to be confused with the name) for the object/structure.
name	character(1). Name of the split/table/row being created. Defaults to same as the corresponding llabel, but is not required to be.
vis	logical. Should the row be visible (LabelRow only).
cinfo	InstantiatedColumnInfo (or NULL). Column structure for the object being created.
indent_mod	numeric. Modifier for the default indent position for the structure created by this function(subtable, content table, or row) <i>and all of that structure's children</i> . Defaults to 0, which corresponds to the unmodified default behavior.
vals	list. cell values for the row
cspan	integer. Column span. 1 indicates no spanning.
var	string, variable name
format	FormatSpec. Format associated with this split. Formats can be declared via strings ("xx.x") or function. In cases such as analyze calls, they can character vectors or lists of functions.
klass	Internal detail.
footnotes	list or NULL. Referential footnotes to be applied at current level
...	passed to shared constructor (. tablerow).

Value

A formal object representing a table row of the constructed type.

Author(s)

Gabriel Becker

label_at_path	<i>Label at Path</i>
---------------	----------------------

Description

Gets or sets the label at a path

Usage

```
label_at_path(tt, path)

label_at_path(tt, path) <- value
```

Arguments

tt	TableTree (or related class). A TableTree object representing a populated table.
path	character. A vector path for a position within the structure of a tabletree. Each element represents a subsequent choice amongst the children of the previous choice.
value	The new value

Details

If path resolves to a single row, the label for that row is retrieved or set. If, instead, path resolves to a subtable, the text for the row-label associated with that path is retrieved or set. In the subtable case, if the label text is set to a non-NA value, the labelrow will be set to visible, even if it was not before. Similarly, if the label row text for a subtable is set to NA, the label row will be set to non-visible, so the row will not appear at all when the table is printed.

Note

When changing the row labels for content rows, it is important to path all the way to the *row*. Paths ending in "@content" will not exhibit the behavior you want, and are thus an error. See [row_paths](#) for help determining the full paths to content rows.

Examples

```
lyt <- basic_table() %>%
  split_rows_by("COUNTRY", split_fun = keep_split_levels(c("CHN", "USA"))) %>%
  analyze("AGE")

tab <- build_table(lyt, DM)

label_at_path(tab, c("COUNTRY", "CHN"))

label_at_path(tab, c("COUNTRY", "USA")) <- "United States"
tab
```

length,CellValue-method
Length of a Cell value

Description

Length of a Cell value

Usage

```
## S4 method for signature 'CellValue'
length(x)
```

Arguments

x x.

Value

Always returns 1L

list_wrap_x *Returns a function that coerces the return values of f to a list*

Description

Returns a function that coerces the return values of f to a list

Usage

```
list_wrap_x(f)

list_wrap_df(f)
```

Arguments

f The function to wrap.

Details

list_wrap_x generates a wrapper which takes x as its first argument, while list_wrap_df generates an otherwise identical wrapper function whose first argument is named df.

We provide both because when using the functions as tabulation in [analyze](#), functions which take df as their first argument are passed the full subset dataframe, while those which accept anything else notably including x are passed only the relevant subset of the variable being analyzed.

Value

A function which calls `f` and converts the result to a list of `CellValue` objects.

Author(s)

Gabriel Becker

Examples

```
summary(iris$Sepal.Length)

f <- list_wrap_x(summary)
f(x = iris$Sepal.Length)

f2 <- list_wrap_df(summary)
f2(df = iris$Sepal.Length)
```

lyt_args

Layouting Function Arg Conventions

Description

Layouting Function Arg Conventions

Usage

```
lyt_args(  
  lyt,  
  var,  
  vars,  
  label,  
  labels_var,  
  varlabels,  
  varnames,  
  split_format,  
  nested,  
  format,  
  cfun,  
  cformat,  
  split_fun,  
  split_name,  
  split_label,  
  afun,  
  inclNAs,  
  valorder,  
  ref_group,
```

```

    compfun,
    label_fstr,
    child_labels,
    extra_args,
    name,
    cuts,
    cutlabels,
    cutfun,
    cutlabelfun,
    cumulative,
    indent_mod,
    show_labels,
    label_pos,
    var_labels,
    cvar,
    table_names,
    topleft,
    align,
    page_by,
    page_prefix,
    format_na_str
)

```

Arguments

lyt	layout object pre-data used for tabulation
var	string, variable name
vars	character vector. Multiple variable names.
label	character(1). A label (not to be confused with the name) for the object/structure.
labels_var	string, name of variable containing labels to be displayed for the values of var
varlabels	character vector. Labels for vars
varnames	character vector. Names for vars which will appear in pathing. When vars are all unique this will be the variable names. If not, these will be variable names with suffixes as necessary to enforce uniqueness.
split_format	FormatSpec. Default format associated with the split being created.
nested	boolean. Should this layout instruction be applied within the existing layout structure <i>if possible</i> (TRUE, the default) or as a new top-level element ('FALSE'). Ignored if it would nest a split underneath analyses, which is not allowed.
format	FormatSpec. Format associated with this split. Formats can be declared via strings ("xx.x") or function. In cases such as analyze calls, they can character vectors or lists of functions.
cfun	list/function/NULL. tabulation function(s) for creating content rows. Must accept x or df as first parameter. Must accept labelstr as the second argument. Can optionally accept all optional arguments accepted by analysis functions. See analyze .
cformat	format spec. Format for content rows

split_fun	function/NULL. custom splitting function See custom_split_funs
split_name	string. Name associated with this split (for pathing, etc)
split_label	string. Label string to be associated with the table generated by the split. Not to be confused with labels assigned to each child (which are based on the data and type of split during tabulation).
afun	function. Analysis function, must take x or df as its first parameter. Can optionally take other parameters which will be populated by the tabulation framework. See Details in analyze .
inclNAs	boolean. Should observations with NA in the var variable(s) be included when performing this analysis. Defaults to FALSE
valorder	character vector. Order that the split children should appear in resulting table.
ref_group	character. Value of var to be taken as the ref_group/control to be compared against.
compfun	function/string. The comparison function which accepts the analysis function outputs for two different partitions and returns a single value. Defaults to subtraction. If a string, taken as the name of a function.
label_fstr	string. An sprintf style format string containing. For non-comparison splits, it can contain up to one "%s" which takes the current split value and generates the row/column label. Comparison-based splits it can contain up to two "%s".
child_labels	string. One of "default", "visible", "hidden". What should the display behavior be for the labels (ie label rows) of the children of this split. Defaults to "default" which flags the label row as visible only if the child has 0 content rows.
extra_args	list. Extra arguments to be passed to the tabulation function. Element position in the list corresponds to the children of this split. Named elements in the child-specific lists are ignored if they do not match a formal argument of the tabulation function.
name	character(1). Name of the split/table/row being created. Defaults to same as the corresponding llabel, but is not required to be.
cuts	numeric. Cuts to use
cutlabels	character (or NULL). Labels for the cuts
cutfun	function. Function which accepts the <i>full vector</i> of var values and returns cut points to be used (via cut) when splitting data during tabulation
cutlabelfun	function. Function which returns either labels for the cuts or NULL when passed the return value of cutfun
cumulative	logical. Should the cuts be treated as cumulative. Defaults to FALSE
indent_mod	numeric. Modifier for the default indent position for the structure created by this function(subtable, content table, or row) <i>and all of that structure's children</i> . Defaults to 0, which corresponds to the unmodified default behavior.
show_labels	character(1). Should the variable labels for corresponding to the variable(s) in vars be visible in the resulting table.

label_pos	character(1). Location the variable label should be displayed, Accepts hidden (default for non-analyze row splits), visible, topleft, and - for analyze splits only - default. For analyze calls, default indicates that the variable should be visible if and only if multiple variables are analyzed at the same level of nesting.
var_labels	character. Variable labels for 1 or more variables
cvar	character(1). The variable, if any, which the content function should accept. Defaults to NA.
table_names	character. Names for the tables representing each atomic analysis. Defaults to var.
topleft	character. Override values for the "top left" material to be displayed during printing.
align	character(1). Alignment the value should be rendered with. See rtables_aligns for currently supported alignments.
page_by	logical(1). Should pagination be forced between different children resulting from this split.
page_prefix	character(1). Prefix, to be appended with the split value, when forcing pagination between the children of this split/table
format_na_str	character(1). String which should be displayed when formatted if this cell's value(s) are all NA.

Value

NULL (this is an argument template dummy function)

See Also

Other conventions: [compat_args\(\)](#), [constr_args\(\)](#), [gen_args\(\)](#), [sf_args\(\)](#)

main_title, VTitleFooter-method
Titles and Footers

Description

Get or set the titles and footers on an object

Usage

```
## S4 method for signature 'VTitleFooter'
main_title(obj)

## S4 replacement method for signature 'VTitleFooter'
main_title(obj) <- value

## S4 method for signature 'VTitleFooter'
```

```
subtitles(obj)

## S4 replacement method for signature 'VTitleFooter'
subtitles(obj) <- value

## S4 method for signature 'VTitleFooter'
main_footer(obj)

## S4 replacement method for signature 'VTitleFooter'
main_footer(obj) <- value

## S4 method for signature 'VTitleFooter'
prov_footer(obj)

## S4 replacement method for signature 'VTitleFooter'
prov_footer(obj) <- value
```

Arguments

obj	ANY. The object for the accessor to access or modify
value	The new value

make_afun

Create custom analysis function wrapping existing function

Description

Create custom analysis function wrapping existing function

Usage

```
make_afun(
  fun,
  .stats = NULL,
  .formats = NULL,
  .labels = NULL,
  .indent_mods = NULL,
  .ungroup_stats = NULL,
  .format_na_strs = NULL,
  ...,
  .null_ref_cells = ".in_ref_col" %in% names(formals(fun))
)
```

Arguments

<code>fun</code>	function. The function to be wrapped in a new customized analysis fun. Should return named list.
<code>.stats</code>	character. Names of elements to keep from fun's full output.
<code>.formats</code>	ANY. vector/list of formats to override any defaults applied by fun.
<code>.labels</code>	character. Vector of labels to override defaults returned by fun
<code>.indent_mods</code>	integer. Named vector of indent modifiers for the generated rows.
<code>.ungroup_stats</code>	character. Vector of names, which must match elements of <code>.stats</code>
<code>.format_na_strs</code>	ANY. vector/list of na strings to override any defaults applied by fun.
<code>...</code>	dots. Additional arguments to fun which effectively become new defaults. These can still be overridden by extra args within a split.
<code>.null_ref_cells</code>	logical(1). Should cells for the reference column be NULL-ed by the returned analysis function. Defaults to TRUE if fun accepts <code>.in_ref_col</code> as a formal argument. Note this argument occurs after <code>...</code> so it must be <i>fully</i> specified by name when set.

Value

A function suitable for use in [analyze](#) with element selection, reformatting, and relabeling performed automatically.

Note

setting `.ungroup_stats` to non-null changes the *structure* of the value(s) returned by fun, rather than just labeling (`.labels`), formatting (`.formats`), and selecting amongst (`.stats`) them. This means that subsequent `make_afun` calls to customize the output further both can and must operate on the new structure, *NOT* the original structure returned by fun. See the final pair of examples below.

See Also

[analyze\(\)](#)

Examples

```
s_summary <- function(x) {
  stopifnot(is.numeric(x))

  list(
    n = sum(!is.na(x)),
    mean_sd = c(mean = mean(x), sd = sd(x)),
    min_max = range(x)
  )
}
```

```

s_summary(iris$Sepal.Length)

a_summary <- make_afun(
  fun = s_summary,
  .formats = c(n = "xx", mean_sd = "xx.xx (xx.xx)", min_max = "xx.xx - xx.xx"),
  .labels = c(n = "n", mean_sd = "Mean (sd)", min_max = "min - max")
)

a_summary(x = iris$Sepal.Length)

a_summary2 <- make_afun(a_summary, .stats = c("n", "mean_sd"))

a_summary2(x = iris$Sepal.Length)

a_summary3 <- make_afun(a_summary, .formats = c(mean_sd = "(xx.xxx, xx.xxx)"))

s_foo <- function(df, .N_col, a = 1, b = 2) {
  list(
    nrow_df = nrow(df),
    .N_col = .N_col,
    a = a,
    b = b
  )
}

s_foo(iris, 40)

a_foo <- make_afun(s_foo, b = 4,
  .formats = c(nrow_df = "xx.xx", ".N_col" = "xx.", a = "xx", b = "xx.x"),
  .labels = c(nrow_df = "Nrow df", ".N_col" = "n in cols", a = "a value", b = "b value"),
  .indent_mods = c(nrow_df = 2L, a = 1L)
)

a_foo(iris, .N_col = 40)
a_foo2 <- make_afun(a_foo, .labels = c(nrow_df = "Number of Rows"))
a_foo(iris, .N_col = 40)

#grouping and further customization
s_grp <- function(df, .N_col, a = 1, b = 2) {
  list(
    nrow_df = nrow(df),
    .N_col = .N_col,
    letters = list(a = a,
                  b = b)
  )
}

a_grp <- make_afun(s_grp, b = 3, .labels = c(nrow_df = "row count", .N_col = "count in column"),
  .formats = c(nrow_df = "xx.", .N_col = "xx."),
  .indent_mod = c(letters = 1L),
  .ungroup_stats = "letters")

```

```

a_grp(iris, 40)
a_aftergrp <- make_afun(a_grp, .stats = c("nrow_df", "b"), .formats = c(b = "xx."))
a_aftergrp(iris, 40)

s_ref <- function(x, .in_ref_col, .ref_group) {
  list(
    mean_diff = mean(x) - mean(.ref_group)
  )
}

a_ref <- make_afun(s_ref, .labels = c(mean_diff = "Mean Difference from Ref"))
a_ref(iris$Sepal.Length, .in_ref_col = TRUE, 1:10)
a_ref(iris$Sepal.Length, .in_ref_col = FALSE, 1:10)

```

make_row_df

Column Layout Summary

Description

Used for Pagination

Usage

```

## S4 method for signature 'VTableTree'
make_row_df(
  tt,
  colwidths = NULL,
  visible_only = TRUE,
  rownum = 0,
  indent = 0L,
  path = character(),
  incontent = FALSE,
  repr_ext = 0L,
  repr_inds = integer(),
  sibpos = NA_integer_,
  nsibs = NA_integer_
)

## S4 method for signature 'TableRow'
make_row_df(
  tt,
  colwidths = NULL,
  visible_only = TRUE,
  rownum = 0,
  indent = 0L,
  path = "root",

```

```

    incontent = FALSE,
    repr_ext = 0L,
    repr_inds = integer(),
    sibpos = NA_integer_,
    nsibs = NA_integer_
  )

  ## S4 method for signature 'LabelRow'
  make_row_df(
    tt,
    colwidths = NULL,
    visible_only = TRUE,
    rownum = 0,
    indent = 0L,
    path = "root",
    incontent = FALSE,
    repr_ext = 0L,
    repr_inds = integer(),
    sibpos = NA_integer_,
    nsibs = NA_integer_
  )

  make_col_df(tt, visible_only = TRUE)

```

Arguments

<code>tt</code>	ANY. Object representing the table-like object to be summarized.
<code>colwidths</code>	numeric. Internal detail do not set manually.
<code>visible_only</code>	logical(1). Should only visible aspects of the table structure be reflected in this summary. Defaults to TRUE. May not be supported by all methods.
<code>rownum</code>	numeric(1). Internal detail do not set manually.
<code>indent</code>	integer(1). Internal detail do not set manually.
<code>path</code>	character. Path to the (sub)table represented by <code>tt</code> . Defaults to <code>character()</code> @details When <code>visible_only</code> is TRUE (the default), methods should return a <code>data.frame</code> with exactly one row per visible row in the table-like object. This is useful when reasoning about how a table will print, but does not reflect the full pathing space of the structure (though the paths which are given will all work as is). If supported, when <code>visible_only</code> is FALSE, every structural element of the table (in row-space) will be reflected in the returned <code>data.frame</code> , meaning the full pathing-space will be represented but some rows in the layout summary will not represent printed rows in the table as it is displayed. Most arguments beyond <code>tt</code> and <code>visible_only</code> are present so that ‘ <code>make_row_df</code> ’ methods can call ‘ <code>make_row_df</code> ’ recursively and retain information, and should not be set during a top-level call
<code>incontent</code>	logical(1). Internal detail do not set manually.

repr_ext	integer(1). Internal detail do not set manually.
repr_inds	integer. Internal detail do not set manually.
sibpos	integer(1). Internal detail do not set manually.
nsibs	integer(1). Internal detail do not set manually.

Value

a data.frame of row/column-structure information used by the pagination machinery.

Note

the technically present root tree node is excluded from the summary returned by both `make_row_df` and `make_col_df`, as it is simply the row/column structure of `tt` and thus not useful for pathing or pagination.

ManualSplit	<i>Manually defined split</i>
-------------	-------------------------------

Description

Manually defined split

Usage

```
ManualSplit(
  levels,
  label,
  name = "manual",
  extra_args = list(),
  indent_mod = 0L,
  cindent_mod = 0L,
  cvar = "",
  cextra_args = list(),
  label_pos = "visible",
  page_prefix = NA_character_
)
```

Arguments

levels	character. Levels of the split (ie the children of the manual split)
label	character(1). A label (not to be confused with the name) for the object/structure.
name	character(1). Name of the split/table/row being created. Defaults to same as the corresponding <code>l</code> label, but is not required to be.
extra_args	list. Extra arguments to be passed to the tabulation function. Element position in the list corresponds to the children of this split. Named elements in the child-specific lists are ignored if they do not match a formal argument of the tabulation function.

indent_mod	numeric. Modifier for the default indent position for the structure created by this function(subtable, content table, or row) <i>and all of that structure's children</i> . Defaults to 0, which corresponds to the unmodified default behavior.
cindent_mod	numeric(1). The indent modifier for the content tables generated by this split.
cvar	character(1). The variable, if any, which the content function should accept. Defaults to NA.
cextra_args	list. Extra arguments to be passed to the content function when tabulating row group summaries.
label_pos	character(1). Location the variable label should be displayed, Accepts hidden (default for non-analyze row splits), visible, topleft, and - for analyze splits only - default. For analyze calls, default indicates that the variable should be visible if and only if multiple variables are analyzed at the same level of nesting.
page_prefix	character(1). Prefix, to be appended with the split value, when forcing pagination between the children of this split/table

Value

A ManualSplit object.

Author(s)

Gabriel Becker

manual_cols	<i>Manual column declaration</i>
-------------	----------------------------------

Description

Manual column declaration

Usage

```
manual_cols(..., .lst = list(...))
```

Arguments

...	One or more vectors of levels to appear in the column space. If more than one set of levels is given, the values of the second are nested within each value of the first, and so on.
.lst	A list of sets of levels, by default populated via <code>list(...)</code> .

Value

An InstantiatedColumnInfo object, suitable for use declaring the column structure for a manually constructed table.

Author(s)

Gabriel Becker

Examples

```
# simple one level column space
rows = lapply(1:5, function(i) {
  DataRow(rep(i, times = 3))})
tab = TableTree(kids = rows, cinfo = manual_cols(split = c("a", "b", "c")))
tab

# manually declared nesting
tab2 = TableTree(kids = list(DataRow(as.list(1:4))),
                 cinfo = manual_cols(Arm = c("Arm A", "Arm B"),
                                     Gender = c("M", "F")))

tab2
```

matrix_form, VTableTree-method

Transform rtable to a list of matrices which can be used for outputting

Description

Although rtables are represented as a tree data structure when outputting the table to ASCII or HTML it is useful to map the rtable to an in between state with the formatted cells in a matrix form.

Usage

```
## S4 method for signature 'VTableTree'
matrix_form(obj, indent_rownames = FALSE, indent_size = 2)
```

Arguments

obj	ANY. The object for the accessor to access or modify
indent_rownames	logical(1), if TRUE the column with the row names in the strings matrix of has indented row names (strings pre-fixed)
indent_size	numeric(1). Number of spaces to use per indent level. Defaults to 2

Details

The strings in the return object are defined as follows: row labels are those determined by `summarize_rows` and cell values are determined using `get_formatted_cells`. (Column labels are calculated using a non-exported internal function).

Value

A list with the following elements:

strings The content, as it should be printed, of the top-left material, column headers, row labels , and cell values of tt

spans The column-span information for each print-string in the strings matrix

aligns The text alignment for each print-string in the strings matrix

display Whether each print-string in the strings matrix should be printed or not.

row_info the data.frame generated by summarize_rows(tt)

With an additional nrow_header attribute indicating the number of pseudo "rows" the column structure defines.

Examples

```
library(dplyr)

iris2 <- iris %>%
  group_by(Species) %>%
  mutate(group = as.factor(rep_len(c("a", "b"), length.out = n()))) %>%
  ungroup()

l <- basic_table() %>%
  split_cols_by("Species") %>%
  split_cols_by("group") %>%
  analyze(c("Sepal.Length", "Petal.Width"), afun = list_wrap_x(summary) , format = "xx.xx")

l

tbl <- build_table(l, iris2)

matrix_form(tbl)
```

MultiVarSplit

Split between two or more different variables

Description

Split between two or more different variables

Usage

```
MultiVarSplit(
  vars,
  split_label = "",
  varlabels = NULL,
  varnames = NULL,
```

```

    cfun = NULL,
    cformat = NULL,
    split_format = NULL,
    split_name = "multivars",
    child_labels = c("default", "visible", "hidden"),
    extra_args = list(),
    indent_mod = 0L,
    cindent_mod = 0L,
    cvar = "",
    cextra_args = list(),
    label_pos = "visible",
    split_fun = NULL,
    page_prefix = NA_character_
  )

```

Arguments

vars	character vector. Multiple variable names.
split_label	string. Label string to be associated with the table generated by the split. Not to be confused with labels assigned to each child (which are based on the data and type of split during tabulation).
varlabels	character vector. Labels for vars
varnames	character vector. Names for vars which will appear in pathing. When vars are all unique this will be the variable names. If not, these will be variable names with suffixes as necessary to enforce uniqueness.
cfun	list/function/NULL. tabulation function(s) for creating content rows. Must accept x or df as first parameter. Must accept labelstr as the second argument. Can optionally accept all optional arguments accepted by analysis functions. See analyze .
cformat	format spec. Format for content rows
split_format	FormatSpec. Default format associated with the split being created.
split_name	string. Name associated with this split (for pathing, etc)
child_labels	string. One of "default", "visible", "hidden". What should the display behavior be for the labels (ie label rows) of the children of this split. Defaults to "default" which flags the label row as visible only if the child has 0 content rows.
extra_args	list. Extra arguments to be passed to the tabulation function. Element position in the list corresponds to the children of this split. Named elements in the child-specific lists are ignored if they do not match a formal argument of the tabulation function.
indent_mod	numeric. Modifier for the default indent position for the structure created by this function(subtable, content table, or row) <i>and all of that structure's children</i> . Defaults to 0, which corresponds to the unmodified default behavior.
cindent_mod	numeric(1). The indent modifier for the content tables generated by this split.
cvar	character(1). The variable, if any, which the content function should accept. Defaults to NA.

cextra_args	list. Extra arguments to be passed to the content function when tabulating row group summaries.
label_pos	character(1). Location the variable label should be displayed, Accepts hidden (default for non-analyze row splits), visible, topleft, and - for analyze splits only - default. For analyze calls, default indicates that the variable should be visible if and only if multiple variables are analyzed at the same level of nesting.
split_fun	function/NULL. custom splitting function See custom_split_funs
page_prefix	character(1). Prefix, to be appended with the split value, when forcing pagination between the children of this split/table

Value

A MultiVarSplit object.

Author(s)

Gabriel Becker

names, VTableNodeInfo-method

Names of a TableTree

Description

Names of a TableTree

Usage

```
## S4 method for signature 'VTableNodeInfo'
names(x)

## S4 method for signature 'InstantiatedColumnInfo'
names(x)

## S4 method for signature 'LayoutColTree'
names(x)

## S4 method for signature 'VTableTree'
row.names(x)
```

Arguments

x the object.

Details

For TableTrees with more than one level of splitting in columns, the names are defined to be the top-level split values repped out across the columns that they span.

Value

The column names of x, as defined in the details above.

no_colinfo	<i>Exported for use in tern</i>
------------	---------------------------------

Description

Does the table/row/InstantiatedColumnInfo object contain no column structure information?

Usage

```
no_colinfo(obj)

## S4 method for signature 'VTableNodeInfo'
no_colinfo(obj)

## S4 method for signature 'InstantiatedColumnInfo'
no_colinfo(obj)
```

Arguments

obj ANY. The object for the accessor to access or modify

Value

TRUE if the object has no/empty instantiated column information, FALSE otherwise.

nrow, VTableTree-method	<i>Table Dimensions</i>
-------------------------	-------------------------

Description

Table Dimensions

Usage

```
## S4 method for signature 'VTableTree'
nrow(x)

## S4 method for signature 'TableRow'
nrow(x)

## S4 method for signature 'VTableNodeInfo'
```

```
ncol(x)

## S4 method for signature 'TableRow'
ncol(x)

## S4 method for signature 'LabelRow'
ncol(x)

## S4 method for signature 'InstantiatedColumnInfo'
ncol(x)

## S4 method for signature 'VTableNodeInfo'
dim(x)
```

Arguments

x TableTree or ElementaryTable object

Value

the number of rows (nrow), columns (ncol) or both (dim) of the object.

Examples

```
tbl <- basic_table() %>%
  split_cols_by("ARM") %>%
  analyze(c("SEX", "AGE")) %>%
  build_table(ex_adsl)

dim(tbl)
nrow(tbl)
ncol(tbl)

NROW(tbl)
NCOL(tbl)
```

obj_avar

Row attribute accessors

Description

Row attribute accessors

Usage

```

obj_avar(obj)

## S4 method for signature 'TableRow'
obj_avar(obj)

## S4 method for signature 'ElementaryTable'
obj_avar(obj)

row_cells(obj)

## S4 method for signature 'TableRow'
row_cells(obj)

row_cells(obj) <- value

## S4 replacement method for signature 'TableRow'
row_cells(obj) <- value

row_values(obj)

## S4 method for signature 'TableRow'
row_values(obj)

row_values(obj) <- value

## S4 replacement method for signature 'TableRow'
row_values(obj) <- value

## S4 replacement method for signature 'LabelRow'
row_values(obj) <- value

```

Arguments

```

obj          ANY. The object for the accessor to access or modify
value       The new value

```

Value

various, depending on the accessor called.

obj_name, VNodeInfo-method

Label, Name and Format accessor generics Getters and setters for basic, relatively universal attributes of "table-like" objects

Description

Label, Name and Format accessor generics

Getters and setters for basic, relatively universal attributes of "table-like" objects"

Usage

```
## S4 method for signature 'VNodeInfo'
obj_name(obj)

## S4 method for signature 'Split'
obj_name(obj)

## S4 replacement method for signature 'VNodeInfo'
obj_name(obj) <- value

## S4 replacement method for signature 'Split'
obj_name(obj) <- value

## S4 method for signature 'Split'
obj_label(obj)

## S4 method for signature 'TableRow'
obj_label(obj)

## S4 method for signature 'VTableTree'
obj_label(obj)

## S4 method for signature 'ValueWrapper'
obj_label(obj)

## S4 replacement method for signature 'Split'
obj_label(obj) <- value

## S4 replacement method for signature 'TableRow'
obj_label(obj) <- value

## S4 replacement method for signature 'ValueWrapper'
obj_label(obj) <- value

## S4 replacement method for signature 'VTableTree'
obj_label(obj) <- value

## S4 method for signature 'VTableNodeInfo'
obj_format(obj)

## S4 method for signature 'CellValue'
obj_format(obj)
```



```
## S4 method for signature 'Split'
obj_format(obj)

## S4 replacement method for signature 'VTableNodeInfo'
obj_format(obj) <- value

## S4 replacement method for signature 'Split'
obj_format(obj) <- value

## S4 replacement method for signature 'CellValue'
obj_format(obj) <- value

obj_na_str(obj)

obj_na_str(obj) <- value

## S4 replacement method for signature 'CellValue'
obj_na_str(obj) <- value

## S4 method for signature 'ANY'
obj_na_str(obj)
```

Arguments

obj	ANY. The object.
value	character(1). The new label

Value

the name, format or label of obj for getters, or obj after modification for setters.

See Also

with_label

Description

Pagination of a TableTree

Usage

```
pag_tt_indices(
  tt,
  lpp = 15,
  min_siblings = 2,
  nosplitin = character(),
  colwidths = NULL,
  verbose = FALSE
)

paginate_table(
  tt,
  lpp = 15,
  min_siblings = 2,
  nosplitin = character(),
  colwidths = NULL,
  verbose = FALSE
)

vpaginate_table(tt, cpp = 40, verbose = FALSE)
```

Arguments

<code>tt</code>	TableTree (or related class). A TableTree object representing a populated table.
<code>lpp</code>	numeric. Maximum lines per page including (re)printed header and context rows
<code>min_siblings</code>	numeric. Minimum sibling rows which must appear on either side of pagination row for a mid-subtable split to be valid. Defaults to 2.
<code>nosplitin</code>	character. List of names of sub-tables where page-breaks are not allowed, regardless of other considerations. Defaults to none.
<code>colwidths</code>	numeric vector. Column widths for use with vertical pagination. Currently ignored.
<code>verbose</code>	logical(1). Should extra debugging messages be shown. Defaults to FALSE.
<code>cpp</code>	numeric(1). Number of columns per page

Value

for `pag_tt_indices` a list of paginated-groups of row-indices of `tt`. For `paginate_table`, The subtables defined by subsetting by the indices defined by `pag_tt_indices`.

Note

This is our first take on pagination. We will refine pagination in subsequent releases. Currently only pagination in the row space work. Pagination in the column space will be added in the future.

Examples

```

s_summary <- function(x) {
  if (is.numeric(x)) {
    in_rows(
      "n" = rcell(sum(!is.na(x)), format = "xx"),
      "Mean (sd)" = rcell(c(mean(x, na.rm = TRUE), sd(x, na.rm = TRUE)),
        format = "xx.xx (xx.xx)"),
      "IQR" = rcell(IQR(x, na.rm = TRUE), format = "xx.xx"),
      "min - max" = rcell(range(x, na.rm = TRUE), format = "xx.xx - xx.xx")
    )
  } else if (is.factor(x)) {

    vs <- as.list(table(x))
    do.call(in_rows, lapply(vs, rcell, format = "xx"))

  } else (
    stop("type not supported")
  )
}

lyt <- basic_table() %>%
split_cols_by(var = "ARM") %>%
  analyze(c("AGE", "SEX", "BEP01FL", "BMRKR1", "BMRKR2", "COUNTRY"), afun = s_summary)

tbl <- build_table(lyt, ex_adsl)
tbl

nrow(tbl)

row_paths_summary(tbl)

tbls <- paginate_table(tbl)
mf <- matrix_form(tbl, indent_rownames = TRUE)
w_tbls <- propose_column_widths(mf) # so that we have the same column widths

tmp <- lapply(tbls, print, widths = w_tbls)

tmp <- lapply(tbls, function(tbli) {
  cat(toString(tbli, widths = w_tbls))
  cat("\n\n")
  cat("~~~~~ PAGE BREAK ~~~~~")
  cat("\n\n")
})

```

Description

Transform TableTree object to Path-Enriched data.frame

Usage

```
path_enriched_df(tt, path_fun = collapse_path, value_fun = collapse_values)
```

Arguments

tt	TableTree (or related class). A TableTree object representing a populated table.
path_fun	function. Function to transform paths into single-string row/column names.
value_fun	function. Function to transform cell values into cells of the data.frame. Defaults to collapse_values which creates strings where multi-valued cells are collapsed together, separated by .

Value

A data frame of tt's cell values (processed by value_fun, with columns named by the full column paths (processed by path_fun and an additional row_path column with the row paths (processed by path_fun).

Examples

```
lyt <- basic_table() %>%
  split_cols_by("ARM") %>%
  analyze(c("AGE", "BMRKR2"))

tbl <- build_table(lyt, ex_adsl)
path_enriched_df(tbl)
```

prune_table

Recursively prune a TableTree

Description

Recursively prune a TableTree

Usage

```
prune_table(
  tt,
  prune_func = prune_empty_level,
  stop_depth = NA_real_,
  depth = 0
)
```

Arguments

tt	TableTree (or related class). A TableTree object representing a populated table.
prune_func	function. A Function to be called on each subtree which returns TRUE if the entire subtree should be removed.
stop_depth	numeric(1). The depth after which subtrees should not be checked for pruning. Defaults to NA which indicates pruning should happen at all levels
depth	numeric(1). Used internally, not intended to be set by the end user.

Value

A TableTree pruned via recursive application of prune_func.

See Also

[prune_empty_level\(\)](#)

rbindl_rtables	<i>rbind TableTree and related objects</i>
----------------	--

Description

rbind TableTree and related objects

Usage

```
rbindl_rtables(x, gap = 0, check_headers = TRUE)

## S4 method for signature 'VTableNodeInfo'
rbind(..., deparse.level = 1)

## S4 method for signature 'VTableNodeInfo,missing'
rbind2(x, y)

## S4 method for signature 'VTableNodeInfo,ANY'
rbind2(x, y)
```

Arguments

x	VTableNodeInfo. TableTree, ElementaryTable or TableRow object.
gap	deprecated. Ignored.
check_headers	deprecated. Ignored.
...	ANY. Elements to be stacked.
deparse.level	numeric(1). Currently Ignored.
y	VTableNodeInfo. TableTree, ElementaryTable or TableRow object.

Value

A formal table object.

Examples

```
mtbl <- rtable(
  header = rheader(
    row(row.name = NULL, rcell("Sepal.Length", colspan = 2), rcell("Petal.Length", colspan=2)),
    rrow(NULL, "mean", "median", "mean", "median")
  ),
  rrow(
    row.name = "All Species",
    mean(iris$Sepal.Length), median(iris$Sepal.Length),
    mean(iris$Petal.Length), median(iris$Petal.Length),
    format = "xx.xx"
  )
)

mtbl2 <- with(subset(iris, Species == 'setosa'), rtable(
  header = rheader(
    row(row.name = NULL, rcell("Sepal.Length", colspan = 2), rcell("Petal.Length", colspan=2)),
    rrow(NULL, "mean", "median", "mean", "median")
  ),
  rrow(
    row.name = "Setosa",
    mean(Sepal.Length), median(Sepal.Length),
    mean(Petal.Length), median(Petal.Length),
    format = "xx.xx"
  )
))

rbind(mtbl, mtbl2)
rbind(mtbl, rrow(), mtbl2)
rbind(mtbl, rrow("aaa"), indent(mtbl2))
```

rcell

Cell value constructors

Description

Construct a cell value and associate formatting, labeling, indenting, and column spanning information with it.

Usage

```
rcell(
  x,
  format = NULL,
  colspan = 1L,
```

```

    label = NULL,
    indent_mod = NULL,
    footnotes = NULL,
    align = NULL,
    format_na_str = NULL
)

non_ref_rcell(
  x,
  is_ref,
  format = NULL,
  colspan = 1L,
  label = NULL,
  indent_mod = NULL,
  refval = NULL,
  align = "center",
  format_na_str = NULL
)

```

Arguments

x	ANY. Cell value
format	if FUN does not return a formatted <code>rcell</code> then the format is applied
colspan	integer(1). Columnspan value.
label	character(1). Label or Null. If non-null, it will be looked at when determining row labels.
indent_mod	numeric. Modifier for the default indent position for the structure created by this function(subtable, content table, or row) <i>and all of that structure's children</i> . Defaults to 0, which corresponds to the unmodified default behavior.
footnotes	list or NULL. Referential footnote messages for the cell.
align	character(1). Alignment the value should be rendered with. See <code>rtables_aligns</code> for currently supported alignments.
format_na_str	character(1). String which should be displayed when formatted if this cell's value(s) are all NA.
is_ref	logical(1). Are we in the reference column (ie <code>.in_ref_col</code> should be passed to this argument)
refval	ANY. Value to use when in the reference column. Defaults to NULL

Details

`non_ref_rcell` provides the common *blank for cells in the reference column, this value otherwise*, and should be passed the value of `.in_ref_col` when it is used.

Value

An object representing the value within a single cell within a populated table. The underlying structure of this object is an implementation detail and should not be relied upon beyond calling accessors for the class.

Note

currently column spanning is only supported for defining header structure.

remove_split_levels *Split functions*

Description

Split functions

Usage

```
remove_split_levels(excl)

keep_split_levels(only, reorder = TRUE)

drop_split_levels(df, spl, vals = NULL, labels = NULL, trim = FALSE)

drop_and_remove_levels(excl)

reorder_split_levels(neworder, newlabels = neworder, drlevels = TRUE)

trim_levels_in_group(innervar, drop_outlevs = TRUE)
```

Arguments

excl	character. Levels to be excluded (they will not be reflected in the resulting table structure regardless of presence in the data).
only	character. Levels to retain (all others will be dropped).
reorder	logical(1). Should the order of only be used as the order of the children of the split. defaults to TRUE
df	dataset (data.frame or tibble)
spl	A Split object defining a partitioning or analysis/tabulation of the data.
vals	ANY. For internal use only.
labels	character. Labels to use for the remaining levels instead of the existing ones.
trim	logical(1). Should splits corresponding with 0 observations be kept when tabulating.
neworder	character. New order or factor levels.
newlabels	character. Labels for (new order of) factor levels
drlevels	logical(1). Should levels in the data which do not appear in neworder be dropped. Defaults to TRUE
innervar	character(1). Variable whose factor levels should be trimmed (e.g., empty levels dropped) <i>separately within each grouping defined at this point in the structure</i>
drop_outlevs	logical(1). Should empty levels in the variable being split on (ie the 'outer' variable, not innervar) be dropped? Defaults to TRUE

Value

a closure suitable for use as a splitting function (`splitfun`) when creating a table layout

Custom Splitting Function Details

User-defined custom split functions can perform any type of computation on the incoming data provided that they meet the contract for generating 'splits' of the incoming data 'based on' the split object.

Split functions are functions that accept:

df data.frame of incoming data to be split

spl a Split object. this is largely an internal detail custom functions will not need to worry about, but `obj_name(spl)`, for example, will give the name of the split as it will appear in paths in the resulting table

vals Any pre-calculated values. If given non-null values, the values returned should match these. Should be NULL in most cases and can likely be ignored

labels Any pre-calculated value labels. Same as above for values

trim If TRUE, resulting splits that are empty should be removed

(Optional) .spl_context a data.frame describing previously performed splits which collectively arrived at `df`

The function must then output a named list with the following elements:

values The vector of all values corresponding to the splits of `df`

datasplit a list of data.frames representing the groupings of the actual observations from `df`.

labels a character vector giving a string label for each value listed in the `values` element above

(Optional) extras If present, extra arguments to be passed to summary and analysis functions whenever they are executed on the corresponding element of `datasplit` or a subset thereof

One way to generate custom splitting functions is to wrap existing split functions and modify either the incoming data before they are called, or their outputs.

Examples

```
l <- basic_table() %>%
  split_cols_by("ARM") %>%
  split_rows_by("COUNTRY", split_fun = remove_split_levels(c("USA", "CAN", "CHE", "BRA"))) %>%
  analyze("AGE")
```

```
build_table(l, DM)
```

```
l <- basic_table() %>%
  split_cols_by("ARM") %>%
  split_rows_by("COUNTRY", split_fun = keep_split_levels(c("USA", "CAN", "BRA"))) %>%
  analyze("AGE")
```

```
build_table(l, DM)
```

```
l <- basic_table() %>%
```

```

split_cols_by("ARM") %>%
split_rows_by("SEX", split_fun = drop_split_levels) %>%
analyze("AGE")

build_table(l, DM)
l <- basic_table() %>%
  split_cols_by("ARM") %>%
  split_rows_by("SEX", split_fun = drop_and_remove_levels(c("M", "U"))) %>%
  analyze("AGE")

build_table(l, DM)

```

rheader

Create a header

Description

Create a header

Usage

```
rheader(..., format = "xx", .lst = NULL)
```

Arguments

...	row specifications (either as character vectors or the output from rrow or DataRow , LabelRow , etc.
format	if FUN does not return a formatted rcell then the format is applied
.lst	list. An already-collected list of arguments tot be used instead of the elements of ... Arguments passed via ... will be ignored if this is specified.

Value

a `InstantiatedColumnInfo` object.

See Also

Other compatability: [rrow1\(\)](#), [rrow\(\)](#), [rtable\(\)](#)

Examples

```

h1 <- rheader(c("A", "B", "C"))

h2 <- rheader(
  rrow(NULL, rcell("group 1", colspan = 2), rcell("group 2", colspan = 2)),
  rrow(NULL, "A", "B", "A", "B")
)

```

h1

h2

row_footnotes

Referential Footnote Accessors

Description

Get and set referential footnotes on aspects of a built table

Usage

```
row_footnotes(obj)
```

```
## S4 method for signature 'TableRow'
```

```
row_footnotes(obj)
```

```
## S4 method for signature 'RowsVerticalSection'
```

```
row_footnotes(obj)
```

```
row_footnotes(obj) <- value
```

```
## S4 replacement method for signature 'TableRow'
```

```
row_footnotes(obj) <- value
```

```
## S4 method for signature 'ElementaryTable'
```

```
row_footnotes(obj)
```

```
cell_footnotes(obj)
```

```
## S4 method for signature 'CellValue'
```

```
cell_footnotes(obj)
```

```
## S4 method for signature 'TableRow'
```

```
cell_footnotes(obj)
```

```
## S4 method for signature 'LabelRow'
```

```
cell_footnotes(obj)
```

```
## S4 method for signature 'ElementaryTable'
```

```
cell_footnotes(obj)
```

```
cell_footnotes(obj) <- value
```

```
## S4 replacement method for signature 'CellValue'
```

```
cell_footnotes(obj) <- value

## S4 replacement method for signature 'DataRow'
cell_footnotes(obj) <- value

## S4 replacement method for signature 'ContentRow'
cell_footnotes(obj) <- value

col_fnotes_here(obj)

## S4 method for signature 'LayoutColTree'
col_fnotes_here(obj)

## S4 method for signature 'LayoutColLeaf'
col_fnotes_here(obj)

col_fnotes_here(obj) <- value

## S4 replacement method for signature 'LayoutColTree'
col_fnotes_here(obj) <- value

## S4 replacement method for signature 'LayoutColLeaf'
col_fnotes_here(obj) <- value

ref_index(obj)

## S4 method for signature 'RefFootnote'
ref_index(obj)

ref_index(obj) <- value

## S4 replacement method for signature 'RefFootnote'
ref_index(obj) <- value

ref_msg(obj)

## S4 method for signature 'RefFootnote'
ref_msg(obj)

fnotes_at_path(obj, rowpath = NULL, colpath = NULL, reset_idx = TRUE) <- value

## S4 replacement method for signature 'VTableTree,character'
fnotes_at_path(obj, rowpath = NULL, colpath = NULL, reset_idx = TRUE) <- value

## S4 replacement method for signature 'VTableTree,`NULL`'
fnotes_at_path(obj, rowpath = NULL, colpath = NULL, reset_idx = TRUE) <- value
```

Arguments

obj	ANY. The object for the accessor to access or modify
value	The new value
rowpath	character or NULL. Path within row structure. NULL indicates the footnote should go on the column rather than cell.
colpath	character or NULL. Path within column structure. NULL indicates footnote should go on the row rather than cell
reset_idx	logical(1). Should the numbering for referential footnotes be immediately recalculated. Defaults to TRUE.

row_paths

Return List with Table Row/Col Paths

Description

Return List with Table Row/Col Paths

Usage

```
row_paths(x)
```

```
col_paths(x)
```

Arguments

x an rtable object

Value

a list of paths to each row/column within x

Examples

```
tbl <- basic_table() %>%
  split_cols_by("ARM") %>%
  analyze(c("SEX", "AGE")) %>%
  build_table(ex_adsl)

tbl

row_paths(tbl)
col_paths(tbl)

cell_values(tbl, c("AGE", "Mean"), c("ARM", "B: Placebo"))
```

row_paths_summary *Print Row/Col Paths Summary*

Description

Print Row/Col Paths Summary

Usage

```
row_paths_summary(x)
```

```
col_paths_summary(x)
```

Arguments

x an rtable object

Value

A data.frame summarizing the row- or column-structure of x.

Examples

```
library(dplyr)

ex_adsl_MF <- ex_adsl %>% filter(SEX %in% c("M", "F"))

tbl <- basic_table() %>%
  split_cols_by("ARM") %>%
  split_cols_by("SEX", split_fun = drop_split_levels) %>%
  analyze(c("AGE", "BMRKR2")) %>%
  build_table(ex_adsl_MF)

tbl

df <- row_paths_summary(tbl)

df

col_paths_summary(tbl)

# manually constructed table
tbl3 <- rtable(
  rheader(
    rrow("row 1", rcell("a", colspan = 2),
      rcell("b", colspan = 2)
    ),
    rrow("h2", "a", "b", "c", "d")),
  rrow("r1", 1, 2, 1, 2), rrow("r2", 3, 4, 2, 1)
```

```
)
col_paths_summary(tbl3)
```

rrow

rrow

Description

rrow

Usage

```
rrow(row.name = "", ..., format = NULL, indent = 0)
```

Arguments

row.name	if NULL then the FUN argument is deparsed and used as row.name of the rrow
...	cell values
format	if FUN does not return a formatted rcell then the format is applied
indent	deprecated.

Value

A row object of the context-appropriate type (label or data)

See Also

Other compatability: [rheader\(\)](#), [rrow1\(\)](#), [rtable\(\)](#)

Examples

```
rrow("ABC", c(1,2), c(3,2), format = "xx (xx.%)")
rrow("")
```

rrowl	<i>rrowl</i>
-------	--------------

Description

rrowl

Usage

```
rrowl(row.name, ..., format = NULL, indent = 0)
```

Arguments

row.name	if NULL then the FUN argument is deparsed and used as row.name of the rrow
...	values in vector/list form
format	if FUN does not return a formatted rcell then the format is applied
indent	deprecated.

Value

A row object of the context-appropriate type (label or data)

See Also

Other compatability: [rheader\(\)](#), [rrow\(\)](#), [rtable\(\)](#)

Examples

```
rrowl("a", c(1,2,3), format = "xx")
rrowl("a", c(1,2,3), c(4,5,6), format = "xx")

rrowl("N", table(iris$Species))
rrowl("N", table(iris$Species), format = "xx")

x <- tapply(iris$Sepal.Length, iris$Species, mean, simplify = FALSE)

rrow(row.name = "row 1", x)
rrow("ABC", 2, 3)

rrowl(row.name = "row 1", c(1, 2), c(3,4))
rrowl(row.name = "row 2", c(1, 2), c(3,4))
```

rtable	<i>Create a Table</i>
--------	-----------------------

Description

Create a Table

Usage

```
rtable(header, ..., format = NULL, hsep = default_hsep())
```

```
rtablel(header, ..., format = NULL, hsep = default_hsep())
```

Arguments

header	Information defining the header (column structure) of the table. This can be as row objects (legacy), character vectors or a <code>InstantiatedColumnInfo</code> object.
...	Rows to place in the table.
format	if FUN does not return a formatted <code>rcell</code> then the format is applied
hsep	character(1). Set of character(s) to be repeated as the separator between the header and body of the table when rendered as text. Defaults to a connected horizontal line (unicode 2014) in locals that use a UTF charset, and to - elsewhere (with a once per session warning).

Value

a formal table object of the appropriate type (`ElementaryTable` or `TableTree`)

See Also

Other compatability: `rheader()`, `rrowl()`, `rrow()`

Examples

```
rtable(
  header = LETTERS[1:3],
  rrow("one to three", 1, 2, 3),
  rrow("more stuff", rcell(pi, format = "xx.xx"), "test", "and more")
)
```

```
# Table with multirow header
sel <- iris$Species == "setosa"
mtbl <- rtable(
  header = rheader(
    rrow(row.name = NULL, rcell("Sepal.Length", colspan = 2),
      rcell("Petal.Length", colspan=2)),
```

```

    rrow(NULL, "mean", "median", "mean", "median")
  ),
  rrow(
    row.name = "All Species",
    mean(iris$Sepal.Length), median(iris$Sepal.Length),
    mean(iris$Petal.Length), median(iris$Petal.Length),
    format = "xx.xx"
  ),
  rrow(
    row.name = "Setosa",
    mean(iris$Sepal.Length[sel]), median(iris$Sepal.Length[sel]),
    mean(iris$Petal.Length[sel]), median(iris$Petal.Length[sel])
  )
)
)

mtbl

names(mtbl) # always first row of header

# Single row header

tbl <- rtable(
  header = c("Treatment\nN=100", "Comparison\nN=300"),
  format = "xx (xx.xx%)",
  rrow("A", c(104, .2), c(100, .4)),
  rrow("B", c(23, .4), c(43, .5)),
  rrow(""),
  rrow("this is a very long section header"),
  rrow("estimate", rcell(55.23, "xx.xx", colspan = 2)),
  rrow("95% CI", indent = 1, rcell(c(44.8, 67.4), format = "(xx.x, xx.x)", colspan = 2))
)
tbl

row.names(tbl)
names(tbl)

# Subsetting
tbl[1, ]
tbl[, 1]

tbl[1,2]
tbl[2, 1]

tbl[3,2]
tbl[5,1]
tbl[5,2]

# # Data Structure methods
dim(tbl)
nrow(tbl)
ncol(tbl)
names(tbl)

```

```
# Colspans

tbl2 <- rtable(
  c("A", "B", "C", "D", "E"),
  format = "xx",
  rrow("r1", 1, 2, 3, 4, 5),

  rrow("r2", rcell("sp2", colspan = 2), "sp1", rcell("sp2-2", colspan = 2))
)

tbl2
```

rtables_aligns	<i>Currently supported cell value alignments</i>
----------------	--

Description

Currently supported cell value alignments

Usage

```
rtables_aligns()
```

Value

a vector of alignments currently supported.

select_all_levels	<i>Add Combination Levels to split</i>
-------------------	--

Description

Add Combination Levels to split

Usage

```
select_all_levels
```

```
add_combo_levels(combosdf, trim = FALSE, first = FALSE, keep_levels = NULL)
```

Arguments

combosdf	data.frame/tbl_df. Columns valname, label, levelcombo, exargs. Of which levelcombo and exargs are list columns. Passing the select_all_levels object as a value in the comblevels column indicates that an overall/all-observations level should be created.
trim	logical(1). Should splits corresponding with 0 observations be kept when tabulating.
first	logical(1). Should the created split level be placed first in the levels (TRUE) or last (FALSE, the default).
keep_levels	character or NULL. If non-NULL, the levels to retain across both combination and individual levels.

Format

An object of class AllLevelsSentinel of length 0.

Value

a closure suitable for use as a splitting function (splfun) when creating a table layout

Note

Analysis or summary functions for which the order matters should never be used within the tabulation framework.

Examples

```
library(tibble)
combodf <- tribble(
  ~valname, ~label, ~levelcombo, ~exargs,
  "A_B", "Arms A+B", c("A: Drug X", "B: Placebo"), list(),
  "A_C", "Arms A+C", c("A: Drug X", "C: Combination"), list())

l <- basic_table() %>%
  split_cols_by("ARM", split_fun = add_combo_levels(combodf)) %>%
  add_colcounts() %>%
  analyze("AGE")

build_table(l, DM)

la <- basic_table() %>%
  split_cols_by("ARM", split_fun = add_combo_levels(combodf, keep_levels = c("A_B", "A_C"))) %>%
  add_colcounts() %>%
  analyze("AGE")

build_table(la, DM)

smallerDM <- droplevels(subset(DM, SEX %in% c("M", "F") &
  grepl("^(A|B)", ARM)))

l2 <- basic_table() %>%
```

```

split_cols_by("ARM", split_fun = add_combo_levels(combodf[1,])) %>%
split_cols_by("SEX", split_fun = add_overall_level("SEX_ALL", "All Genders")) %>%
add_colcounts() %>%
analyze("AGE")

l3 <- basic_table() %>%
  split_cols_by("ARM", split_fun = add_combo_levels(combodf)) %>%
  add_colcounts() %>%
  split_rows_by("SEX", split_fun = add_overall_level("SEX_ALL", "All Genders")) %>%
  summarize_row_groups() %>%
  analyze("AGE")

build_table(l3, smallerDM)

```

sf_args

Split Function Arg Conventions

Description

Split Function Arg Conventions

Usage

```
sf_args(trim, label, first)
```

Arguments

trim	logical(1). Should splits corresponding with 0 observations be kept when tabulating.
label	character(1). A label (not to be confused with the name) for the object/structure.
first	logical(1). Should the created split level be placed first in the levels (TRUE) or last (FALSE, the default).

Value

NULL (this is an argument template dummy function)

See Also

Other conventions: [compat_args\(\)](#), [constr_args\(\)](#), [gen_args\(\)](#), [lyt_args\(\)](#)

simple_analysis	<i>Default tabulation</i>
-----------------	---------------------------

Description

This function is used when [analyze](#) is invoked

Usage

```
simple_analysis(x, ...)  
  
## S4 method for signature 'numeric'  
simple_analysis(x, ...)  
  
## S4 method for signature 'logical'  
simple_analysis(x, ...)  
  
## S4 method for signature 'factor'  
simple_analysis(x, ...)  
  
## S4 method for signature 'ANY'  
simple_analysis(x, ...)
```

Arguments

x	the <i>already split</i> data being tabulated for a particular cell/set of cells
...	passed on directly

Details

This function has the following behavior given particular types of inputs:

numeric calls [mean](#) on x

logical calls [sum](#) on x

factor calls [length](#) on x

`in_rows` is called on the resulting value(s).

All other classes of input currently lead to an error.

Value

an `RowsVerticalSection` object (or `NULL`). The details of this object should be considered an internal implementation detail.

Author(s)

Gabriel Becker and Adrian Waddell

Examples

```
simple_analysis(1:3)
simple_analysis(iris$Species)
simple_analysis(iris$Species == "setosa")
```

sort_at_path	<i>Sort substructure of a TableTree at a particular Path in the Tree.</i>
--------------	---

Description

Sort substructure of a TableTree at a particular Path in the Tree.

Usage

```
sort_at_path(
  tt,
  path,
  scorefun,
  decreasing = NA,
  na.pos = c("omit", "last", "first")
)
```

Arguments

tt	TableTree (or related class). A TableTree object representing a populated table.
path	character. A vector path for a position within the structure of a tabletree. Each element represents a subsequent choice amongst the children of the previous choice.
scorefun	function. Scoring function, should accept the type of children directly under the position at path (either VTableTree, VTableRow, or VTableNodeInfo, which covers both) and return a numeric value to be sorted.
decreasing	logical(1). Should the the scores generated by scorefun be sorted in decreasing order. If unset (the default of NA), it is set to TRUE if the generated scores are numeric and FALSE if they are characters.
na.pos	character(1). What should be done with children (subtrees/rows) with NA scores. Defaults to "omit", which removes them, other allowed values are "last" and "first" which indicate where they should be placed in the order.

Details

The path here can include "*" as a step, which means taht each child at that step will be *separately* sorted based on scorefun and the remaining path entries. This can occur multiple times in a path.

Value

A TableTree with the same structure as tt with the exception that the requested sorting has been done at path

split_cols_by

*Declaring a column-split based on levels of a variable***Description**

Will generate children for each subset of a categorical variable

Usage

```
split_cols_by(
  lyt,
  var,
  labels_var = var,
  split_label = var,
  split_fun = NULL,
  format = NULL,
  nested = TRUE,
  child_labels = c("default", "visible", "hidden"),
  extra_args = list(),
  ref_group = NULL
)
```

Arguments

lyt	layout object pre-data used for tabulation
var	string, variable name
labels_var	string, name of variable containing labels to be displayed for the values of var
split_label	string. Label string to be associated with the table generated by the split. Not to be confused with labels assigned to each child (which are based on the data and type of split during tabulation).
split_fun	function/NULL. custom splitting function See custom_split_funs
format	FormatSpec. Format associated with this split. Formats can be declared via strings ("xx.x") or function. In cases such as analyze calls, they can character vectors or lists of functions.
nested	boolean. Should this layout instruction be applied within the existing layout structure <i>if possible</i> (TRUE, the default) or as a new top-level element ('FALSE'). Ignored if it would nest a split underneath analyses, which is not allowed.
child_labels	string. One of "default", "visible", "hidden". What should the display behavior be for the labels (ie label rows) of the children of this split. Defaults to "default" which flags the label row as visible only if the child has 0 content rows.
extra_args	list. Extra arguments to be passed to the tabulation function. Element position in the list corresponds to the children of this split. Named elements in the child-specific lists are ignored if they do not match a formal argument of the tabulation function.
ref_group	character(1) or NULL. Level of var which should be considered ref_group/reference

Value

A PreDataTableLayouts object suitable for passing to further layouting functions, and to `build_table`.

Custom Splitting Function Details

User-defined custom split functions can perform any type of computation on the incoming data provided that they meet the contract for generating 'splits' of the incoming data 'based on' the split object.

Split functions are functions that accept:

df data.frame of incoming data to be split

spl a Split object. this is largely an internal detail custom functions will not need to worry about, but `obj_name(spl)`, for example, will give the name of the split as it will appear in paths in the resulting table

vals Any pre-calculated values. If given non-null values, the values returned should match these. Should be NULL in most cases and can likely be ignored

labels Any pre-calculated value labels. Same as above for values

trim If TRUE, resulting splits that are empty should be removed

(Optional) .spl_context a data.frame describing previously performed splits which collectively arrived at df

The function must then output a named list with the following elements:

values The vector of all values corresponding to the splits of df

datasplit a list of data.frames representing the groupings of the actual observations from df.

labels a character vector giving a string label for each value listed in the values element above

(Optional) extras If present, extra arguments to be passed to summary and analysis functions whenever they are executed on the corresponding element of `datasplit` or a subset thereof

One way to generate custom splitting functions is to wrap existing split functions and modify either the incoming data before they are called, or their outputs.

Author(s)

Gabriel Becker

Examples

```
lyt <- basic_table() %>%
  split_cols_by("ARM") %>%
  analyze(c("AGE", "BMRKR2"))

build_table(lyt, ex_adsl)

# Let's look at the splits in more detail

l <- basic_table() %>% split_cols_by("ARM")
```

```

1

# add an analysis (summary)
l2 <- l %>%
  analyze(c("AGE", "COUNTRY"), afun = list_wrap_x(summary) , format = "xx.xx")
l2

build_table(l2, DM)

# By default sequentially adding layouts results in nesting
library(dplyr)
DM_MF <- DM %>% filter(SEX %in% c("M", "F")) %>% mutate(SEX = droplevels(SEX))

l3 <- basic_table() %>% split_cols_by("ARM") %>%
  split_cols_by("SEX") %>%
  analyze(c("AGE", "COUNTRY"), afun = list_wrap_x(summary), format = "xx.xx")
l3

  build_table(l3, DM_MF)

# nested=TRUE vs not
l4 <- basic_table() %>% split_cols_by("ARM") %>%
  split_rows_by("SEX", split_fun = drop_split_levels) %>%
  split_rows_by("RACE", split_fun = drop_split_levels) %>%
  analyze("AGE")

l4
build_table(l4, DM)

l5 <- basic_table() %>% split_cols_by("ARM") %>%
  split_rows_by("SEX", split_fun= drop_split_levels) %>%
  analyze("AGE") %>%
  split_rows_by("RACE", nested=FALSE, split_fun = drop_split_levels) %>%
  analyze("AGE")

l5
build_table(l5, DM)

```

split_cols_by_cuts *Split on static or dynamic cuts of the data*

Description

Create columns (or row splits) based on values (such as quartiles) of var.

Usage

```
split_cols_by_cuts(
```

```
    lyt,  
    var,  
    cuts,  
    cutlabels = NULL,  
    split_label = var,  
    nested = TRUE,  
    cumulative = FALSE  
  )
```

```
split_rows_by_cuts(  
  lyt,  
  var,  
  cuts,  
  cutlabels = NULL,  
  split_label = var,  
  nested = TRUE,  
  cumulative = FALSE,  
  label_pos = "hidden"  
)
```

```
split_cols_by_cutfun(  
  lyt,  
  var,  
  cutfun = qtile_cuts,  
  cutlabelfun = function(x) NULL,  
  split_label = var,  
  format = NULL,  
  nested = TRUE,  
  extra_args = list(),  
  cumulative = FALSE  
)
```

```
split_cols_by_quartiles(  
  lyt,  
  var,  
  split_label = var,  
  format = NULL,  
  nested = TRUE,  
  extra_args = list(),  
  cumulative = FALSE  
)
```

```
split_rows_by_quartiles(  
  lyt,  
  var,  
  split_label = var,  
  format = NULL,  
  nested = TRUE,
```

```

    child_labels = c("default", "visible", "hidden"),
    extra_args = list(),
    cumulative = FALSE,
    indent_mod = 0L,
    label_pos = "hidden"
  )

split_rows_by_cutfun(
  lyt,
  var,
  cutfun = qtile_cuts,
  cutlabelfun = function(x) NULL,
  split_label = var,
  format = NULL,
  nested = TRUE,
  child_labels = c("default", "visible", "hidden"),
  extra_args = list(),
  cumulative = FALSE,
  indent_mod = 0L,
  label_pos = "hidden"
)

```

Arguments

lyt	layout object pre-data used for tabulation
var	string, variable name
cuts	numeric. Cuts to use
cutlabels	character (or NULL). Labels for the cutst
split_label	string. Label string to be associated with the table generated by the split. Not to be confused with labels assigned to each child (which are based on the data and type of split during tabulation).
nested	boolean. Should this layout instruction be applied within the existing layout structure <i>if possible</i> (TRUE, the default) or as a new top-level element ('FALSE). Ignored if it would nest a split underneath analyses, which is not allowed.
cumulative	logical. Should the cuts be treated as cumulative. Defaults to FALSE
label_pos	character(1). Location the variable label should be displayed, Accepts hidden (default for non-analyze row splits), visible, topleft, and - for analyze splits only - default. For analyze calls, default indicates that the variable should be visible if and only if multiple variables are analyzed at the same level of nesting.
cutfun	function. Function which accepts the full vector of var values and returns cut points to be passed to cut.
cutlabelfun	function. Function which returns either labels for the cuts or NULL when passed the return value of cutfun
format	FormatSpec. Format associated with this split. Formats can be declared via strings ("xx.x") or function. In cases such as analyze calls, they can character vectors or lists of functions.

extra_args	list. Extra arguments to be passed to the tabulation function. Element position in the list corresponds to the children of this split. Named elements in the child-specific lists are ignored if they do not match a formal argument of the tabulation function.
child_labels	string. One of "default", "visible", "hidden". What should the display behavior be for the labels (ie label rows) of the children of this split. Defaults to "default" which flags the label row as visible only if the child has 0 content rows.
indent_mod	numeric. Modifier for the default indent position for the structure created by this function(subtable, content table, or row) <i>and all of that structure's children</i> . Defaults to 0, which corresponds to the unmodified default behavior.

Details

For dynamic cuts, the cut is transformed into a static cut by `build_table` based on the full dataset, before proceeding. Thus even when nested within another split in column/row space, the resulting split will reflect the overall values (e.g., quartiles) in the dataset, NOT the values for subset it is nested under.

Value

A `PreDataTableLayouts` object suitable for passing to further layouting functions, and to `build_table`.

Author(s)

Gabriel Becker

Examples

```
library(dplyr)

# split_cols_by_cuts
l <- basic_table() %>%
  split_cols_by("ARM") %>%
  split_cols_by_cuts("AGE", split_label = "Age",
                    cuts = c(0, 25, 35, 1000),
                    cutlabels = c("young", "medium", "old")) %>%
  analyze(c("BMRKR2", "STRATA2")) %>%
  append_topleft("counts")

build_table(l, ex_ads1)

# split_rows_by_cuts
l <- basic_table() %>%
  split_cols_by("ARM") %>%
  split_rows_by_cuts("AGE", split_label = "Age",
                    cuts = c(0, 25, 35, 1000),
                    cutlabels = c("young", "medium", "old")) %>%
  analyze(c("BMRKR2", "STRATA2")) %>%
  append_topleft("counts")
```

```

build_table(l, ex_adsl)

# split_cols_by_quartiles

l <- basic_table() %>%
  split_cols_by("ARM") %>%
  split_cols_by_quartiles("AGE", split_label = "Age") %>%
  analyze(c("BMRKR2", "STRATA2")) %>%
  append_topleft("counts")

build_table(l, ex_adsl)

# split_rows_by_quartiles
l <- basic_table() %>%
  split_cols_by("ARM") %>%
  add_colcounts() %>%
  split_rows_by_quartiles("AGE", split_label = "Age") %>%
  analyze("BMRKR2") %>%
  append_topleft(c("Age Quartiles", " Counts BMRKR2"))

build_table(l, ex_adsl)

```

```
split_cols_by_multivar
```

Associate Multiple Variables with Columns

Description

In some cases, the variable to be ultimately analyzed is most naturally defined on a column, not a row basis. When we need columns to reflect different variables entirely, rather than different levels of a single variable, we use `split_cols_by_multivar`

Usage

```

split_cols_by_multivar(
  lyt,
  vars,
  split_fun = NULL,
  varlabels = vars,
  varnames = NULL,
  nested = TRUE
)

```

Arguments

lyt	layout object pre-data used for tabulation
vars	character vector. Multiple variable names.
split_fun	function/NULL. custom splitting function See custom_split_funs
varlabels	character vector. Labels for vars
varnames	character vector. Names for vars which will appear in pathing. When vars are all unique this will be the variable names. If not, these will be variable names with suffixes as necessary to enforce uniqueness.
nested	boolean. Should this layout instruction be applied within the existing layout structure <i>if possible</i> (TRUE, the default) or as a new top-level element ('FALSE). Ignored if it would nest a split underneath analyses, which is not allowed.

Value

A PreDataTableLayouts object suitable for passing to further layouting functions, and to `build_table`.

Author(s)

Gabriel Becker

See Also

[analyze_colvars](#)

Examples

```
library(dplyr)
ANL <- DM %>% mutate(value = rnorm(n()), pctdiff = runif(n()))

## toy example where we take the mean of the first variable and the
## count of >.5 for the second.
colfuncs <- list(function(x) in_rows(mean = mean(x), .formats = "xx.x"),
                 function(x) in_rows("# x > 5" = sum(x > .5), .formats = "xx"))

l <- basic_table() %>%
  split_cols_by("ARM") %>%
  split_cols_by_multivar(c("value", "pctdiff")) %>%
  split_rows_by("RACE", split_label = "ethnicity", split_fun = drop_split_levels) %>%
  summarize_row_groups() %>%
  analyze_colvars(afun = colfuncs)

l

build_table(l, ANL)
```

split_rows_by

Add Rows according to levels of a variable

Description

Add Rows according to levels of a variable

Usage

```
split_rows_by(
  lyt,
  var,
  labels_var = var,
  split_label = var,
  split_fun = NULL,
  format = NULL,
  nested = TRUE,
  child_labels = c("default", "visible", "hidden"),
  label_pos = "hidden",
  indent_mod = 0L,
  page_by = FALSE,
  page_prefix = split_label
)
```

Arguments

lyt	layout object pre-data used for tabulation
var	string, variable name
labels_var	string, name of variable containing labels to be displayed for the values of var
split_label	string. Label string to be associated with the table generated by the split. Not to be confused with labels assigned to each child (which are based on the data and type of split during tabulation).
split_fun	function/NULL. custom splitting function See custom_split_funs
format	FormatSpec. Format associated with this split. Formats can be declared via strings ("xx.x") or function. In cases such as analyze calls, they can character vectors or lists of functions.
nested	boolean. Should this layout instruction be applied within the existing layout structure <i>if possible</i> (TRUE, the default) or as a new top-level element ('FALSE). Ignored if it would nest a split underneath analyses, which is not allowed.
child_labels	string. One of "default", "visible", "hidden". What should the display behavior be for the labels (ie label rows) of the children of this split. Defaults to "default" which flags the label row as visible only if the child has 0 content rows.

label_pos	character(1). Location the variable label should be displayed, Accepts hidden (default for non-analyze row splits), visible, topleft, and - for analyze splits only - default. For analyze calls, default indicates that the variable should be visible if and only if multiple variables are analyzed at the same level of nesting.
indent_mod	numeric. Modifier for the default indent position for the structure created by this function(subtable, content table, or row) <i>and all of that structure's children</i> . Defaults to 0, which corresponds to the unmodified default behavior.
page_by	logical(1). Should pagination be forced between different children resulting from this split.
page_prefix	character(1). Prefix, to be appended with the split value, when forcing pagination between the children of this split/table

Value

A PreDataTableLayouts object suitable for passing to further layouting functions, and to build_table.

Custom Splitting Function Details

User-defined custom split functions can perform any type of computation on the incoming data provided that they meet the contract for generating 'splits' of the incoming data 'based on' the split object.

Split functions are functions that accept:

df data.frame of incoming data to be split

spl a Split object. this is largely an internal detail custom functions will not need to worry about, but obj_name(spl), for example, will give the name of the split as it will appear in paths in the resulting table

vals Any pre-calculated values. If given non-null values, the values returned should match these. Should be NULL in most cases and can likely be ignored

labels Any pre-calculated value labels. Same as above for values

trim If TRUE, resulting splits that are empty should be removed

(Optional) .spl_context a data.frame describing previously performed splits which collectively arrived at df

The function must then output a named list with the following elements:

values The vector of all values corresponding to the splits of df

datasplit a list of data.frames representing the groupings of the actual observations from df.

labels a character vector giving a string label for each value listed in the values element above

(Optional) extras If present, extra arguments to be passed to summary and analysis functions whenever they are executed on the corresponding element of datasplit or a subset thereof

One way to generate custom splitting functions is to wrap existing split functions and modify either the incoming data before they are called, or their outputs.

Note

If `var` is a factor with empty unobserved levels and `labels_var` is specified, it must also be a factor with the same number of levels as `var`. Currently the error that occurs when this is not the case is not very informative, but that will change in the future.

Author(s)

Gabriel Becker

Examples

```
l <- basic_table() %>%
  split_cols_by("ARM") %>%
  split_rows_by("RACE", split_fun = drop_split_levels) %>%
  analyze("AGE", mean, var_labels = "Age", format = "xx.xx")

build_table(l, DM)

basic_table() %>%
  split_cols_by("ARM") %>%
  split_rows_by("RACE") %>%
  analyze("AGE", mean, var_labels = "Age", format = "xx.xx") %>%
  build_table(DM)

l <- basic_table() %>%
  split_cols_by("ARM") %>%
  split_cols_by("SEX") %>%
  summarize_row_groups(label_fstr = "Overall (N)") %>%
  split_rows_by("RACE", split_label = "Ethnicity", labels_var = "ethn_lab",
               split_fun = drop_split_levels) %>%
  summarize_row_groups("RACE", label_fstr = "%s (n)") %>%
  analyze("AGE", var_labels = "Age", afun = mean, format = "xx.xx")

l

library(dplyr)
DM2 <- DM %>%
  filter(SEX %in% c("M", "F")) %>%
  mutate(
    SEX = droplevels(SEX),
    gender_lab = c("F" = "Female", "M" = "Male",
                  "U" = "Unknown", "UNDIFFERENTIATED" = "Undifferentiated")[SEX],
    ethn_lab = c(
      "ASIAN" = "Asian",
      "BLACK OR AFRICAN AMERICAN" = "Black or African American",
      "WHITE" = "White",
      "AMERICAN INDIAN OR ALASKA NATIVE" = "American Indian or Alaska Native",
      "MULTIPLE" = "Multiple",
      "NATIVE HAWAIIAN OR OTHER PACIFIC ISLANDER" =
```

```

        "Native Hawaiian or Other Pacific Islander",
        "OTHER" = "Other", "UNKNOWN" = "Unknown"
    )[RACE]
)
build_table(1, DM2)

```

spl_context	<i>spl_context within analysis and split functions .spl_context in analysis and split functions</i>
-------------	---

Description

spl_context within analysis and split functions

.spl_context in analysis and split functions

.spl_context Details

The .spl_context data.frame gives information about the subsets of data corresponding to the splits within-which the current analyze action is nested. Taken together, these correspond to the path that the resulting (set of) rows the analysis function is creating, although the information is in a slightly different form. Each split (which correspond to groups of rows in the resulting table) is represented via the following columns:

split The name of the split (often the variable being split in the simple case)

value The string representation of the value at that split

full_parent_df a dataframe containing the full data (ie across all columns) corresponding to the path defined by the combination of split and value of this row *and all rows above this row*

all_cols_n the number of observations corresponding to this row grouping (union of all columns)

(row-split and analyze contexts only) <1 column for each column in the table structure These list columns (named the same as names(col_exprs(tab))) contain logical vectors corresponding to the subset of this row's full_parent_df corresponding to that column

cur_col_subset List column containing logical vectors indicating the subset of that row's full_parent_df for the column currently being created by the analysis function

cur_col_n integer column containing the observation counts for that split

note Within analysis functions that accept .spl_context, the all_cols_n and cur_col_n columns of the dataframe will contain the 'true' observation counts corresponding to the row-group and row-group x column subsets of the data. These numbers will not, and currently cannot, reflect alternate column observation counts provided by the alt_counts_df, col_counts or col_total arguments to build_table

summarize_rows	<i>summarize_rows</i>
----------------	-----------------------

Description

summarize_rows

Usage

```
summarize_rows(obj)
```

Arguments

obj VTableTree.

Value

A data.frame summarizing the rows in obj.

summarize_row_groups	<i>Add a content row of summary counts</i>
----------------------	--

Description

Add a content row of summary counts

Usage

```
summarize_row_groups(
  lyt,
  var = "",
  label_fstr = "%s",
  format = "xx (xx.x%)",
  cfun = NULL,
  indent_mod = 0L,
  extra_args = list()
)
```

Arguments

lyt	layout object pre-data used for tabulation
var	string, variable name
label_fstr	string. An sprintf style format string containing. For non-comparison splits, it can contain up to one "%s" which takes the current split value and generates the row/column label. Comparison-based splits it can contain up to two "%s".

format	FormatSpec. Format associated with this split. Formats can be declared via strings ("xx.x") or function. In cases such as analyze calls, they can character vectors or lists of functions.
cfun	list/function/NULL. tabulation function(s) for creating content rows. Must accept x or df as first parameter. Must accept labelstr as the second argument. Can optionally accept all optional arguments accepted by analysis functions. See analyze .
indent_mod	numeric. Modifier for the default indent position for the structure created by this function(subtable, content table, or row) <i>and all of that structure's children</i> . Defaults to 0, which corresponds to the unmodified default behavior.
extra_args	list. Extra arguments to be passed to the tabulation function. Element position in the list corresponds to the children of this split. Named elements in the child-specific lists are ignored if they do not match a formal argument of the tabulation function.

Details

If format expects 1 value (i.e. it is specified as a format string and xx appears xx appears values (i.e. xx appears twice in the format string) or is specified as a function, then both raw and percent of column total counts are calculated. If format is a format string where xx appears only one time, only raw counts are used.

cfun must accept df as its first argument and will receive the subset data.frame corresponding with the row- and column-splitting for the cell being calculated. Must accept labelstr as the second parameter, which accepts the label of the level of the parent split currently being summarized. Can additionally take any optional argument supported by analysis functions. (see [analyze](#)).

Value

A PreDataTableLayouts object suitable for passing to further layouting functions, and to build_table.

Author(s)

Gabriel Becker

Examples

```
DM2 <- subset(DM, COUNTRY %in% c("USA", "CAN", "CHN"))

l <- basic_table() %>% split_cols_by("ARM") %>%
  split_rows_by("COUNTRY", split_fun = drop_split_levels) %>%
  summarize_row_groups(label_fstr = "%s (n)") %>%
  analyze("AGE", afun = list_wrap_x(summary), format = "xx.xx")
l

tbl <- build_table(l, DM2)

tbl
```

```

row_paths_summary(tbl) # summary count is a content table

## use a cfun and extra_args to customize summarization
## behavior
sfun <- function(x, labelstr, trim) {
  in_rows(
    c(mean(x, trim = trim), trim),
    .formats = "xx.x (xx.x%)",
    .labels = sprintf("%s (Trimmed mean and trim %%)",
                      labelstr)
  )
}

l2 <- basic_table() %>% split_cols_by("ARM") %>%
  split_rows_by("COUNTRY", split_fun = drop_split_levels) %>%
  add_colcounts() %>%
  summarize_row_groups("AGE", cfun = sfun,
                       extra_args = list(trim = .2)) %>%
  analyze("AGE", afun = list_wrap_x(summary), format = "xx.xx") %>%
  append_topleft(c("Country", " Age"))

tbl2 <- build_table(l2, DM2)
tbl2

```

table_shell

Table shells

Description

A table shell is a rendering of the table which maintains the structure, but does not display the values, rather displaying the formatting instructions for each cell.

Usage

```
table_shell(tt, widths = NULL, col_gap = 3, hsep = default_hsep())
```

```
table_shell_str(tt, widths = NULL, col_gap = 3, hsep = default_hsep())
```

Arguments

tt	TableTree (or related class). A TableTree object representing a populated table.
widths	widths of row.name and columns columns
col_gap	gap between columns
hsep	character to create line separator

Value

for `table_shell_str` the string representing the table shell, for `table_shell`, NULL, as the function is called for the side effect of printing the shell to the console

Examples

```
library(dplyr)

iris2 <- iris %>%
  group_by(Species) %>%
  mutate(group = as.factor(rep_len(c("a", "b"), length.out = n()))) %>%
  ungroup()

l <- basic_table() %>%
  split_cols_by("Species") %>%
  split_cols_by("group") %>%
  analyze(c("Sepal.Length", "Petal.Width"), afun = list_wrap_x(summary), format = "xx.xx")

tbl <- build_table(l, iris2)
table_shell(tbl)
```

table_structure	<i>Summarize Table</i>
-----------------	------------------------

Description

Summarize Table

Usage

```
table_structure(x, detail = c("subtable", "row"))
```

Arguments

x	a table object
detail	either row or subtable

Value

currently no return value. Called for the side-effect of printing a row- or subtable-structure summary of x.

Examples

```

library(dplyr)

iris2 <- iris %>%
  group_by(Species) %>%
  mutate(group = as.factor(rep_len(c("a", "b"), length.out = n()))) %>%
  ungroup()

l <- basic_table() %>%
  split_cols_by("Species") %>%
  split_cols_by("group") %>%
  analyze(c("Sepal.Length", "Petal.Width"), afun = list_wrap_x(summary) , format = "xx.xx")

tbl <- build_table(l, iris2)
tbl

row_paths(tbl)

table_structure(tbl)

table_structure(tbl, detail = "row")

```

top_left

Top Left Material (Experimental)

Description

A TableTree object can have *top left material* which is a sequence of strings which are printed in the area of the table between the column header display and the label of the first row. These functions access and modify that material.

Usage

```

top_left(obj)

## S4 method for signature 'VTableTree'
top_left(obj)

## S4 method for signature 'InstantiatedColumnInfo'
top_left(obj)

## S4 method for signature 'PreDataTableLayouts'
top_left(obj)

top_left(obj) <- value

## S4 replacement method for signature 'VTableTree'
top_left(obj) <- value

```



```
## S4 replacement method for signature 'InstantiatedColumnInfo'
top_left(obj) <- value

## S4 replacement method for signature 'PreDataTableLayouts'
top_left(obj) <- value
```

Arguments

obj ANY. The object for the accessor to access or modify
value The new value

Value

A character vector representing the top-left material of obj (or obj after modification, in the case of the setter).

tostring	<i>Convert an rtable object to a string</i>
----------	---

Description

Convert an rtable object to a string

Usage

```
## S4 method for signature 'VTableTree'
toString(
  x,
  widths = NULL,
  col_gap = 3,
  hsep = horizontal_sep(x),
  indent_size = 2
)
```

Arguments

x table object
widths widths of row.name and columns columns
col_gap gap between columns
hsep character to create line separator
indent_size numeric(1). Number of spaces to use per indent level. Defaults to 2

Value

a string representation of x as it appears when printed.

Examples

```

library(dplyr)

iris2 <- iris %>%
  group_by(Species) %>%
  mutate(group = as.factor(rep_len(c("a", "b"), length.out = n()))) %>%
  ungroup()

l <- basic_table() %>%
  split_cols_by("Species") %>%
  split_cols_by("group") %>%
  analyze(c("Sepal.Length", "Petal.Width"), afun = list_wrap_x(summary) , format = "xx.xx")

tbl <- build_table(l, iris2)

cat(toString(tbl, col_gap = 3))

```

tree_children	<i>Retrieve or set the direct children of a Tree-style object</i>
---------------	---

Description

Retrieve or set the direct children of a Tree-style object

Usage

```

tree_children(x)

## S4 method for signature 'VTree'
tree_children(x)

## S4 method for signature 'VTableTree'
tree_children(x)

## S4 method for signature 'VLeaf'
tree_children(x)

tree_children(x) <- value

## S4 replacement method for signature 'VTree'
tree_children(x) <- value

## S4 replacement method for signature 'VTableTree'
tree_children(x) <- value

```

Arguments

x	An object with a Tree structure
value	New list of children.

Value

List of direct children of x

trim_levels_to_map	<i>Trim Levels to map</i>
--------------------	---------------------------

Description

This split function constructor create a split function which trims levels of a variable to reflect restrictions on the possible combinations of two or more variables which are split by (along the same axis) within a layout.

Usage

```
trim_levels_to_map(map = NULL)
```

Arguments

map	data.frame. A data.frame defining allowed combinations of variables. Any combination at the level of this split not present in the map will be removed from the data, both for the variable being split and those present in the data but not associated with this split or any parents of it.
-----	--

Details

When splitting occurs, the map is subset to the values of all previously performed splits. The levels of the variable being split are then pruned to only those still present within this subset of the map representing the current hierarchical splitting context.

Splitting is then performed via the [keep_split_levels](#) split function.

Each resulting element of the partition is then further trimmed by pruning values of any remaining variables specified in the map to those values allowed under the combination of the previous and current split.

Value

a fun

See Also

[trim_levels_in_group](#)

Examples

```
map <- data.frame(
  LBCAT = c("CHEMISTRY", "CHEMISTRY", "CHEMISTRY", "IMMUNOLOGY"),
  PARAMCD = c("ALT", "CRP", "CRP", "IGA"),
  ANRIND = c("LOW", "LOW", "HIGH", "HIGH"),
  stringsAsFactors = FALSE
)

lyt <- basic_table() %>%
  split_rows_by("LBCAT") %>%
  split_rows_by("PARAMCD", split_fun = trim_levels_to_map(map = map)) %>%
  analyze("ANRIND")
tbl1 <- build_table(lyt, ex_adlb)
```

trim_rows

Trim rows from a populated table without regard for table structure

Description

Trim rows from a populated table without regard for table structure

Usage

```
trim_rows(tt, criteria = all_zero_or_na)
```

Arguments

tt	TableTree (or related class). A TableTree object representing a populated table.
criteria	function. Function which takes a TableRow object and returns TRUE if that row should be removed. Defaults to all_zero_or_na

Value

The table with rows that have only NA or 0 cell values removed

Note

Visible LabelRows are including in this trimming, which can lead to either all label rows being trimmed or label rows remaining when all data rows have been trimmed, depending on what criteria returns when called on a LabelRow object. To avoid this, use the structurally-aware [prune_table](#) machinery instead.

See Also

[prune_table\(\)](#)

trim_zero_rows	<i>Trim Zero Rows</i>
----------------	-----------------------

Description

Trim Zero Rows

Usage

```
trim_zero_rows(tbl)
```

Arguments

tbl table object

Value

an rtable object

tt_at_path	<i>Get or set table elements at specified path</i>
------------	--

Description

Get or set table elements at specified path

Usage

```
tt_at_path(tt, path, ...)

## S4 method for signature 'VTableTree'
tt_at_path(tt, path, ...)

tt_at_path(tt, path, ...) <- value

## S4 replacement method for signature 'VTableTree,ANY,VTableTree'
tt_at_path(tt, path, ...) <- value

## S4 replacement method for signature 'VTableTree,ANY,`NULL`'
tt_at_path(tt, path, ...) <- value

## S4 replacement method for signature 'VTableTree,ANY,TableRow'
tt_at_path(tt, path, ...) <- value
```

Arguments

tt	TableTree (or related class). A TableTree object representing a populated table.
path	character. A vector path for a position within the structure of a tabletree. Each element represents a subsequent choice amongst the children of the previous choice.
...	unused.
value	The new value

tt_to_flextable	<i>Create a FlexTable object representing an rtables TableTree</i>
-----------------	--

Description

Create a FlexTable object representing an rtables TableTree

Usage

```
tt_to_flextable(
  tt,
  paginate = FALSE,
  lpp = NULL,
  ...,
  colwidths = propose_column_widths(matrix_form(tt, indent_rownames = TRUE)),
  total_width = 10
)
```

Arguments

tt	TableTree (or related class). A TableTree object representing a populated table.
paginate	logical(1). Should tt be paginated and exported as multiple flextables. Defaults to FALSE
lpp	numeric. Maximum lines per page including (re)printed header and context rows
...	Passed on to methods or tabulation functions.
colwidths	numeric vector. Column widths for use with vertical pagination. Currently ignored.
total_width	numeric(1). Total width in inches for the resulting flextable(s). Defaults to 5.

Value

a flextable object

Examples

```
analysisfun <- function(x, ...) {
  in_rows(row1 = 5,
          row2 = c(1, 2),
          .row_footnotes = list(row1 = "row 1 - row footnote"),
          .cell_footnotes = list(row2 = "row 2 - cell footnote"))
}

lyt <- basic_table(title = "Title says Whaaaat", subtitles = "Oh, ok.",
                  main_footer = "ha HA! Footer!") %>%
split_cols_by("ARM") %>%
analyze("AGE", afun = analysisfun)

tbl <- build_table(lyt, ex_adsl)
ft <- tt_to_flextable(tbl)
ft
```

update_ref_indexing *Update footnote indexes on a built table*

Description

Re-indexes footnotes within a built table

Usage

```
update_ref_indexing(tt)
```

Arguments

tt TableTree (or related class). A TableTree object representing a populated table.

Details

After adding or removing referential footnotes manually, or after subsetting a table, the reference indexes (ie the number associated with specific footnotes) may be incorrect. This function recalculates these based on the full table.

Note

In the future this should not generally need to be called manually.

`value_formats`*Value Formats*

Description

Returns a matrix of formats for the cells in a table

Usage

```
value_formats(obj, default = obj_format(obj))

## S4 method for signature 'ANY'
value_formats(obj, default = obj_format(obj))

## S4 method for signature 'TableRow'
value_formats(obj, default = obj_format(obj))

## S4 method for signature 'LabelRow'
value_formats(obj, default = obj_format(obj))

## S4 method for signature 'VTableTree'
value_formats(obj, default = obj_format(obj))
```

Arguments

<code>obj</code>	A table or row object.
<code>default</code>	FormatSpec.

Value

Matrix (storage mode list) containing the effective format for each cell position in the table (including 'virtual' cells implied by label rows, whose formats are always NULL)

Examples

```
lyt <- basic_table() %>%
  split_rows_by("RACE", split_fun = keep_split_levels(c("ASIAN", "WHITE"))) %>%
  analyze("AGE")

tbl <- build_table(lyt, DM)
value_formats(tbl)
```

VarLevelSplit-class *Split on levels within a variable*

Description

Split on levels within a variable

Usage

```
VarLevelSplit(  
  var,  
  split_label,  
  labels_var = NULL,  
  cfun = NULL,  
  cformat = NULL,  
  split_fun = NULL,  
  split_format = NULL,  
  valorder = NULL,  
  split_name = var,  
  child_labels = c("default", "visible", "hidden"),  
  extra_args = list(),  
  indent_mod = 0L,  
  label_pos = c("topleft", "hidden", "visible"),  
  cindent_mod = 0L,  
  cvar = "",  
  cextra_args = list(),  
  page_prefix = NA_character_  
)
```

```
VarLevWBaselineSplit(  
  var,  
  ref_group,  
  labels_var = var,  
  split_label,  
  split_fun = NULL,  
  label_fstr = "%s - %s",  
  cfun = NULL,  
  cformat = NULL,  
  cvar = "",  
  split_format = NULL,  
  valorder = NULL,  
  split_name = var,  
  extra_args = list()  
)
```

Arguments

var string, variable name

split_label	string. Label string to be associated with the table generated by the split. Not to be confused with labels assigned to each child (which are based on the data and type of split during tabulation).
labels_var	string, name of variable containing labels to be displayed for the values of var
cfun	list/function/NULL. tabulation function(s) for creating content rows. Must accept x or df as first parameter. Must accept labelstr as the second argument. Can optionally accept all optional arguments accepted by analysis functions. See analyze .
cformat	format spec. Format for content rows
split_fun	function/NULL. custom splitting function See custom_split_funs
split_format	FormatSpec. Default format associated with the split being created.
valorder	character vector. Order that the split children should appear in resulting table.
split_name	string. Name associated with this split (for pathing, etc)
child_labels	string. One of "default", "visible", "hidden". What should the display behavior be for the labels (ie label rows) of the children of this split. Defaults to "default" which flags the label row as visible only if the child has 0 content rows.
extra_args	list. Extra arguments to be passed to the tabulation function. Element position in the list corresponds to the children of this split. Named elements in the child-specific lists are ignored if they do not match a formal argument of the tabulation function.
indent_mod	numeric. Modifier for the default indent position for the structure created by this function(subtable, content table, or row) <i>and all of that structure's children</i> . Defaults to 0, which corresponds to the unmodified default behavior.
label_pos	character(1). Location the variable label should be displayed, Accepts hidden (default for non-analyze row splits), visible, topleft, and - for analyze splits only - default. For analyze calls, default indicates that the variable should be visible if and only if multiple variables are analyzed at the same level of nesting.
cindent_mod	numeric(1). The indent modifier for the content tables generated by this split.
cvar	character(1). The variable, if any, which the content function should accept. Defaults to NA.
cextra_args	list. Extra arguments to be passed to the content function when tabulating row group summaries.
page_prefix	character(1). Prefix, to be appended with the split value, when forcing pagination between the children of this split/table
ref_group	character. Value of var to be taken as the ref_group/control to be compared against.
label_fstr	string. An sprintf style format string containing. For non-comparison splits, it can contain up to one "%s" which takes the current split value and generates the row/column label. Comparison-based splits it can contain up to two "%s".

Value

a VarLevelSplit object.

Author(s)

Gabriel Becker

`VarStaticCutSplit-class`*Splits for cutting by values of a numeric variable*

Description

Splits for cutting by values of a numeric variable

Create static cut or static cumulative cut split

Usage

```
make_static_cut_split(  
  var,  
  split_label,  
  cuts,  
  cutlabels = NULL,  
  cfun = NULL,  
  cformat = NULL,  
  split_format = NULL,  
  split_name = var,  
  child_labels = c("default", "visible", "hidden"),  
  extra_args = list(),  
  indent_mod = 0L,  
  cindent_mod = 0L,  
  cvar = "",  
  cextra_args = list(),  
  label_pos = "visible",  
  cumulative = FALSE,  
  page_prefix = NA_character_  
)
```

```
VarDynCutSplit(  
  var,  
  split_label,  
  cutfun,  
  cutlabelfun = function(x) NULL,  
  cfun = NULL,  
  cformat = NULL,  
  split_format = NULL,  
  split_name = var,  
  child_labels = c("default", "visible", "hidden"),  
  extra_args = list(),  
  cumulative = FALSE,
```

```

indent_mod = 0L,
cindent_mod = 0L,
cvar = "",
cextra_args = list(),
label_pos = "visible",
page_prefix = NA_character_
)

```

Arguments

var	string, variable name
split_label	string. Label string to be associated with the table generated by the split. Not to be confused with labels assigned to each child (which are based on the data and type of split during tabulation).
cuts	numeric. Cuts to use
cutlabels	character (or NULL). Labels for the cuts
cfun	list/function/NULL. tabulation function(s) for creating content rows. Must accept x or df as first parameter. Must accept labelstr as the second argument. Can optionally accept all optional arguments accepted by analysis functions. See analyze .
cformat	format spec. Format for content rows
split_format	FormatSpec. Default format associated with the split being created.
split_name	string. Name associated with this split (for pathing, etc)
child_labels	string. One of "default", "visible", "hidden". What should the display behavior be for the labels (ie label rows) of the children of this split. Defaults to "default" which flags the label row as visible only if the child has 0 content rows.
extra_args	list. Extra arguments to be passed to the tabulation function. Element position in the list corresponds to the children of this split. Named elements in the child-specific lists are ignored if they do not match a formal argument of the tabulation function.
indent_mod	numeric. Modifier for the default indent position for the structure created by this function(subtable, content table, or row) <i>and all of that structure's children</i> . Defaults to 0, which corresponds to the unmodified default behavior.
cindent_mod	numeric(1). The indent modifier for the content tables generated by this split.
cvar	character(1). The variable, if any, which the content function should accept. Defaults to NA.
cextra_args	list. Extra arguments to be passed to the content function when tabulating row group summaries.
label_pos	character(1). Location the variable label should be displayed, Accepts hidden (default for non-analyze row splits), visible, topleft, and - for analyze splits only - default. For analyze calls, default indicates that the variable should be visible if and only if multiple variables are analyzed at the same level of nesting.
cumulative	logical. Should the cuts be treated as cumulative. Defaults to FALSE

page_prefix	character(1). Prefix, to be appended with the split value, when forcing pagination between the children of this split/table
cutfun	function. Function which accepts the <i>full vector</i> of var values and returns cut points to be used (via cut) when splitting data during tabulation
cutlabelfun	function. Function which returns either labels for the cuts or NULL when passed the return value of cutfun

Value

a VarStaticCutSplit, CumulativeCutSplit object for make_static_cut_split, or a VarDynCutSplit object for VarDynCutSplit()

vars_in_layout	<i>List Variables required by a pre-data table layout</i>
----------------	---

Description

List Variables required by a pre-data table layout

Usage

```
vars_in_layout(lyt)

## S4 method for signature 'PreDataTableLayouts'
vars_in_layout(lyt)

## S4 method for signature 'PreDataAxisLayout'
vars_in_layout(lyt)

## S4 method for signature 'SplitVector'
vars_in_layout(lyt)

## S4 method for signature 'Split'
vars_in_layout(lyt)

## S4 method for signature 'CompoundSplit'
vars_in_layout(lyt)

## S4 method for signature 'ManualSplit'
vars_in_layout(lyt)
```

Arguments

lyt The Layout (or a component thereof)

Details

This will walk the layout declaration and return a vector of the names of the unique variables that are used in any of the following ways:

- Variable being split on (directly or via cuts)
- Element of a Multi-variable column split
- Content variable
- Value-label variable

Value

A character vector containing the unique variables explicitly used in the layout (see Notes).

Note

This function will not detect dependencies implicit in analysis or summary functions which accept `df` and then rely on the existence of particular variables not being split on/ analyzed.

The order these variable names appear within the return vector is undefined and should not be relied upon.

Examples

```
lyt <- basic_table() %>%
  split_cols_by("ARM") %>%
  split_cols_by("SEX") %>%
  summarize_row_groups(label_fstr = "Overall (N)") %>%
  split_rows_by("RACE", split_label = "Ethnicity", labels_var = "ethn_lab",
               split_fun = drop_split_levels) %>%
  summarize_row_groups("RACE", label_fstr = "%s (n)") %>%
  analyze("AGE", var_labels = "Age", afun = mean, format = "xx.xx")

vars_in_layout(lyt)
```

Viewer

Display an `rtable` object in the Viewer pane in RStudio or in a browser

Description

The table will be displayed using the bootstrap styling for tables.

Usage

```
Viewer(x, y = NULL, row.names.bold = FALSE, ...)
```

Arguments

x object of class `rtable` or `shiny.tag` (defined in `htmltools`)
y optional second argument of same type as x
row.names.bold `row.names.bold` boolean, make rownames bold
... arguments passed to `as_html`

Value

not meaningful. Called for the side effect of opening a browser or viewer pane.

Examples

```
if(interactive()) {
  s15 <- factor(iris$Sepal.Length > 5, levels = c(TRUE, FALSE),
    labels = c("S.L > 5", "S.L <= 5"))

  df <- cbind(iris, s15 = s15)

  tbl <- basic_table() %>%
    split_cols_by("s15") %>%
    analyze("Sepal.Length") %>%
    build_table(df)

  Viewer(tbl)
  Viewer(tbl, tbl)

  tbl2 <- htmltools::tags$div(
    class = "table-responsive",
    as_html(tbl, class_table = "table")
  )

  Viewer(tbl, tbl2)
}
```

[<-,VTableTree,ANY,ANY,list-method

retrieve and assign elements of a TableTree

Description

retrieve and assign elements of a `TableTree`

Usage

```

## S4 replacement method for signature 'VTableTree,ANY,ANY,list'
x[i, j, ...] <- value

## S4 replacement method for signature 'VTableTree,ANY,ANY,CellValue'
x[i, j, ...] <- value

## S4 method for signature 'VTableTree,logical,logical'
x[i, j, ..., drop = FALSE]

## S4 method for signature 'VTableTree,logical,ANY'
x[i, j, ..., drop = FALSE]

## S4 method for signature 'VTableTree,logical,missing'
x[i, j, ..., drop = FALSE]

## S4 method for signature 'VTableTree,ANY,logical'
x[i, j, ..., drop = FALSE]

## S4 method for signature 'VTableTree,ANY,missing'
x[i, j, ..., drop = FALSE]

## S4 method for signature 'VTableTree,missing,ANY'
x[i, j, ..., drop = FALSE]

## S4 method for signature 'VTableTree,ANY,character'
x[i, j, ..., drop = FALSE]

## S4 method for signature 'VTableTree,character,ANY'
x[i, j, ..., drop = FALSE]

## S4 method for signature 'VTableTree,character,character'
x[i, j, ..., drop = FALSE]

## S4 method for signature 'VTableTree,missing,numeric'
x[i, j, ..., drop = FALSE]

## S4 method for signature 'VTableTree,numeric,numeric'
x[i, j, ..., drop = FALSE]

## S4 method for signature 'VTableTree,list'
x[[i, j, ...]]

```

Arguments

x	TableTree
i	index
j	index

...	Includes
	keep_topleft logical(1) ([only) Should the 'top-left' material for the table be retained after subsetting. Defaults to NA, which retains the material if all rows are included (ie subsetting was by column), and drops it otherwise.
	keep_titles logical(1) Should title and non-referential footer information be retained. Defaults to FALSE
	reindex_refs logical(1). Should referential footnotes be re-indexed as if the resulting subset is the entire table. Defaults to TRUE
value	Replacement value (list, TableRow, or TableTree)
drop	logical(1). Should the value in the cell be returned if only one cell is selected by the combination of i and j. Defaults to FALSE

Value

a TableTree (or ElementaryTable) object, unless a single cell was selected with drop=TRUE, in which case the (possibly multi-valued) fully stripped raw value of the selected cell.

Examples

```
l <- basic_table() %>%
  split_cols_by("ARM") %>%
  analyze(c("SEX", "AGE"))

tbl <- build_table(l, DM)

tbl

tbl[1, ]
tbl[1:2, 2]

tbl[2, 1]
tbl[2, 1, drop = TRUE]

tbl[, 1]

tbl[-2, ]
tbl[, -1]

tbl[2, 1] <- rcell(999)
tbl[2, ] <- list(rrow("FFF", 888, 666, 777))
tbl[3, ] <- list(-111, -222, -333)
tbl
```

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