

# Package ‘SimpleUpset’

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**Type** Package

**Title** Create Upset Plots

**Version** 0.1.2

**Description** Create Upset plots using a combination of 'ggplot2' and 'patchwork'.

**URL** <https://github.com/smped/SimpleUpset>

**BugReports** <https://github.com/smped/SimpleUpset/issues>

**License** GPL-3

**Encoding** UTF-8

**Depends** ggplot2 (>= 4.0.0), patchwork (>= 1.3.2), R (>= 4.1.0),

**Imports** dplyr, methods, rlang (>= 1.1.6), S7, scales, tidyr,  
tidyselect

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**Config/testthat/edition** 3

**VignetteBuilder** knitr

**NeedsCompilation** no

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**Repository** CRAN

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default\_set\_layers     *Define default layers for individual UpSet components*

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## Description

Define and modify default layers for individual UpSet components

## Usage

```
default_set_layers(  
  ...,  
  fill = NULL,  
  labels = "size",  
  f = comma,  
  expand = c(0.2, 0),  
  hjust = 1.1,  
  label_size = 3.5,  
  name = "Set Size",  
  dry_run = FALSE  
)  
  
default_intersect_layers(  
  ...,  
  fill = NULL,  
  labels = "size",  
  f = comma,  
  expand = c(0, 0.05),  
  vjust = -0.5,  
  label_size = 3.5,  
  name = "Intersection Size",  
  dry_run = FALSE  
)  
  
default_grid_layers(  
  ...,  
  colour = NULL,  
  fill = NULL,  
  light = "grey80",  
  dark = "grey23",  
  shape = 19,  
  size = 4,  
  name = NULL,  
  dry_run = FALSE  
)
```

**Arguments**

|              |   |
|--------------|---|
| ...          | additional layers to include alongside default layers. Will be added after the default layers   |
| fill         | Column to fill set bars by. Can be 'set' or another column within the main data object  |
| labels       | Choose either size or prop to label bars with totals or the proportion of all intersections   |
| f            | Function for labelling set or intersection sizes  |
| expand       | Multiplicative axis expansion passed to <code>ggplot2::expansion()</code>   |
| hjust, vjust | Passed to respective elements for simple adjustment of either set or intersection sizes   |
| label_size   | Passed to labels for sets and intersections   |
| name         | Main axis title   |
| dry_run      | Set as TRUE to view the unevaluated layers which are defined as the defaults. Additional layers passed through the ellipsis will not be included as part of a dry_run |
| colour       | Primarily used for highlighting points and segments in the intersections matrix   |
| light, dark  | default colours for empty intersections (light) and for both non-empty intersections and segments (dark)  |
| shape, size  | Point shape/size passed to the intersections matrix   |

**Details**

These functions define the default layers for inclusion on UpSet plots.

The returned object is a list with a series of layers, scales, themes etc which represent the default plotting layers for each of the sets, intersections and intersections matrix (grid) panels.

A series of common arguments have been defined to enable common modifications without recreating the list from scratch. These include modifying the mapping to fill, axis expansion to better accommodate labels, labelling functions for set/intersection sizes, and axis titles.

Additional layers, such as `scale_fill_*` elements, guides or themes, can be simply included by passing to the function, without any requirement for naming, and are handled by the ellipsis.

The entire command used to create default layers can be shown by calling each function using the argument `dry_run = TRUE`. This can be helpful for creating custom layers, by starting with then modifying the defaults.

The returned object is a simple list, and are easily modifiable using simple list operations. Each list of default layers is described clearly below. If passing additional scales, themes, layers or guides using the ellipsis, these additional elements will automatically be placed after the defaults. Importantly, these will be created as lists, then can be re-ordered using standard list manipulation.

**Default Layers For Sets:****ggplot2 element**

```
aes(y = set)
```

```
geom_bar(bar_aes)
geom_text(aes(x = size, label = f(size)), hjust = hjust, size = label_size)
scale_x_reverse(expand = c(expand, 0, 0, 0), name = name, labels = f)
scale_y_discrete(position = "right", name = NULL, labels = NULL)
theme(axis.text.y.right = element_text(hjust = 0.5), axis.ticks.y.right = element_blank(), margins = margin(5.5, 5.5, 0, 0))
```

### Default Layers For Intersections:

#### ggplot2 element

```
aes(x = intersect)
geom_bar(bar_aes)
geom_text(aes(y = size, label = f(size)), vjust = vjust, size = label_size)
scale_x_discrete(name = NULL, labels = NULL)
scale_y_continuous(name = name, expand = c(0, 0, expand, 0), labels = f)
theme(axis.ticks.x.bottom = element_blank(), margins = margin(5.5, 5.5, 0, 0))
```

#### Comment

Intersections are placed along the x-axis.  
If fill = NULL, bar\_aes is the fill aesthetic.  
Adds intersection totals using geom\_text().  
Tidies up the x-axis, hiding intersection labels.  
Standard y-axis with name and labels.  
Ensures margins and tick marks are consistent.

### Default Layers For Intersections Matrix (i.e. Grid):

#### ggplot2 element

```
aes(x = intersect, y = set)
if (!is.null(colour)) geom_point(mapping = points_aes, size = size, shape = shape) else geom_point(mapping = points_aes, size = size, shape = shape, colour = light)
geom_point(size = size, shape = shape, colour = light)
if (!is.null(colour)) geom_segment(segment_aes) else geom_segment(segment_aes, colour = dark)
scale_y_discrete(name = NULL)
scale_x_discrete(name = name, labels = NULL)
guides(colour = guide_none())
theme(margins = margin(5.5, 5.5, 5.5, 0), axis.text.y = element_text(hjust = 0.5), axis.ticks = element_blank())
```

### Panel Internals:

Internally, the supplied data.frame has the additional columns 'intersect', 'degree' added, along with the optional 'highlight' column. This object is used to directly create bars using geom\_bar() and as such, any of the additional columns can be passed to geom\_bar() as mapping aesthetics, along with all original columns.

For both the sets and intersection totals (i.e. labels), separate tables are created specifically for printing totals at the top (or left) of each bar, and these tables are specifically passed to those layers. Totals are included as 'size' and the proportion of all intersections is also included as the column 'prop' for both the sets and intersections panel. Whilst default labels are added using 'size', changing this to 'prop' and using scales::percent() will work and is supported.

### Value

List of ggplot2 elements

### Examples

```
# View the un-evaluated list of default layers for the sets
```

```

default_set_layers(dry_run = TRUE)

# Create set layers colouring by set name, and hiding the legend
set_list <- default_set_layers(
  fill = "set", scale_fill_brewer(palette = "Set1"), guides(fill = guide_none())
)
sapply(set_list, is)

```

---

simpleUpSet

*Make simple UpSet plots*


---

### Description

Make simple UpSet plots using ggplot2 and patchwork

### Usage

```

simpleUpSet(
  x,
  sets = NULL,
  sort_sets = size,
  sort_intersect = list(desc(size), degree, set),
  n_intersect = 20,
  min_size = 0,
  min_degree = 1,
  max_degree = length(sets),
  set_layers = default_set_layers(),
  intersect_layers = default_intersect_layers(),
  grid_layers = default_grid_layers(),
  highlight = NULL,
  highlight_levels = NULL,
  annotations = list(),
  width = 0.75,
  height = 0.75,
  vjust_ylab = 0.8,
  stripe_colours = c("grey90", "white"),
  guides = "keep",
  top_left = NULL,
  ...,
  na.rm = TRUE
)

```

### Arguments

|      |   |
|------|---|
| x    | Input data frame                              |
| sets | Character vector listing columns of x to plot |

|                        |   |
|------------------------|---|
| sort_sets              | <data-masking> specification for set order, using variables such as size, desc(size) or NULL. Passed internally to <code>dplyr::arrange()</code> . The only possible options are size, desc(size) or NULL (for sets in the order passed)  |
| sort_intersect         | list of <data-masking> specifications for intersection order. Passed internally to <code>dplyr::arrange()</code> . The available columns are size, degree and set, along with highlight if specified. Any other column names will cause an error. The default order is in descending sizes, using degree and set to break ties. |
| n_intersect            | Maximum number of intersections to show   |
| min_size               | Only show intersections larger than this value  |
| min_degree, max_degree | Only show intersections within this range   |
| set_layers             | List of ggplot2 layers, scales and themes to define the appearance of the sets panel. Can be obtained and extended using <code>default_set_layers()</code>  |
| intersect_layers       | List of ggplot2 layers, scales and themes to define the appearance of the intersections panel. Can be obtained and extended using <code>default_intersect_layers()</code>   |
| grid_layers            | List of ggplot2 layers, scales & themes   |
| highlight              | <code>dplyr::case_when()</code> statement defining all intersections to highlight using <code>geom_intersect</code> and <code>scale_fill/colour_intersect</code> . Will add a column named highlight which can be called from any geom passed to the intersections barplot or matrix  |
| highlight_levels       | Given the highlight column will be coerced to a factor when setting colours etc, levels can be manually set here for finer control.   |
| annotations            | list where each element is a list of ggplot2 layers. Each element will be added as an upper annotation panel above the intersections plot. All layer types (geom, scale, aes, stat, labs etc) can be passed with the exception of facets.   |
| width, height          | Proportional width and height of the intersection panel   |
| vjust_ylab             | Used to nudge the y-axis labels closer to the axis  |
| stripe_colours         | Colours for background stripes in the lower two panels. For no stripes, set as NULL   |
| guides                 | Passed to <code>patchwork::plot_layout()</code>   |
| top_left               | Optional ggplot object to show in the top left panel. Will default to an empty ggplot object  |
| ...                    | Not used  |
| na.rm                  | NA handling   |

## Details

Taking a subset of columns from a data.frame, create an UpSet plot showing all intersections as specified. Columns chosen for the sets and intersections must contain logical values or be strictly 0/1 values.

Internally, data objects will have the variables set and intersect which can be referred to when passing custom aes() mappings to various layers. If specifying highlights, the column highlight

will also be added as a column to the data.frame containing intersections data, following the case\_when output provided as the argument. Scales can be passed to the intersections and grid panels, taking this structure into account.

Any additional layers passed using annotations() will have layers added after an initial, internal call to ggplot(data, aes(x = intersect)). Additional columns can be used where appropriate for creating boxplots etc.

A list of ggplot2 layers, scales, guides and themes is expected in each of the set\_layers, intersect\_layers or grid\_layers arguments, with defaults generated by calls to default\_set\_layers(), default\_intersect\_layers() or default\_grid\_layers(). These can be used as templates to full customisation by creating a custom list object, or modified directly using the ellipsis

## Value

Object of class 'patchwork' containing multiple ggplot panels

## Examples

```
## Use a modified version of the movies data provided with the package UpSetR
library(tidyverse)
theme_set(theme_bw())
sets <- c("Action", "Comedy", "Drama", "Thriller", "Romance")
movies <- system.file("extdata", "movies.tsv.gz", package = "SimpleUpset") %>%
  read_tsv() %>%
  mutate(
    Decade = fct_inorder(Decade) %>% fct_rev()
  )
simpleUpSet(movies, sets)

## Add a detailed upper plot
simpleUpSet(
  movies, sets, n_intersect = 10,
  annotations = list(
    list(
      aes(y = AvgRating),
      geom_jitter(aes(colour = Decade), height = 0, width = 0.3, alpha = 0.5),
      geom_violin(fill = NA, quantiles = 0.5, quantile.linetype = 1),
      scale_colour_brewer(palette = "Paired"),
      guides(colour = guide_legend(nrow = 2, reverse = TRUE))
    )
  ), guides = "collect"
) &
  theme(legend.position = "bottom")

## Modify set colours
set_cols <- c(
  Action = "red", Comedy = "grey23", Drama = "red",
  Romance = "grey23", Thriller = "grey23"
)
simpleUpSet(
  movies, sets,
  set_layers = default_set_layers(
```

```
    fill = "set", scale_fill_manual(values = set_cols), guides(fill = guide_none())  
  )  
)
```



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