Package ‘gridpattern’

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Type Package

Title 'grid' Pattern Grobs

Version 0.5.3

Description Provides 'grid' grobs that fill in a user-defined area with various patterns. Includes enhanced versions of the geometric and image-based patterns originally contained in the 'ggpattern' package as well as original 'pch', 'polygon_tiling', 'regular_polygon', 'rose', 'text', 'wave', and 'weave' patterns plus support for custom user-defined patterns.

URL https://trevorldavis.com/R/gridpattern/,
      https://github.com/trevorld/gridpattern

BugReports https://github.com/trevorld/gridpattern/issues

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alphaMaskGrob | Mask grob using another grob to specify the (alpha) mask

Description

alphaMaskGrob() masks a grob using another grob to specify the (alpha) mask.

Usage

alphaMaskGrob(
  maskee,
  masker,
  use_R4.1_masks =getOption("ggpattern_use_R4.1_masks",
    getOption("ggpattern_use_R4.1_features")),
  png_device = NULL,
  res = getOption("ggpattern_res", 72),
  name = NULL,
  gp = gpar(),
  )
alphaMaskGrob

\[
vp = \text{NULL}
\]

**Arguments**

- **maskee**
  - Grob to be masked
- **masker**
  - Grob that defines masking region
- **use.R4.1.masks**
  - If TRUE use the grid mask feature introduced in R v4.1.0. If FALSE do a rasterGrob approximation. If NULL try to guess an appropriate choice. Note not all graphic devices support the grid mask feature.
- **png_device**
  - "png" graphics device to save intermediate raster data with if use.R4.1.masks is FALSE. If NULL and suggested package ragg is available and versions are high enough we directly capture masked raster via ragg::agg_capture(). Otherwise we will use png_device (default ragg::agg_png() if available else grDevices::png()) and png::readPNG() to manually compute a masked raster.
- **res**
  - Resolution of desired rasterGrob in pixels per inch if use.R4.1.masks is FALSE.
- **name**
  - A character identifier.
- **gp**
  - An object of class "gpar", typically the output from a call to the function gpar. This is basically a list of graphical parameter settings.
- **vp**
  - A Grid viewport object (or NULL).

**Value**

A grid grob

**Examples**

```r
if (capabilities("png") && require("grid")) {
  maskee <- patternGrob("circle", gp = gpar(col = "black", fill = "yellow"),
    spacing = 0.1, density = 0.5)
  angle <- seq(2 * pi / 4, by = 2 * pi / 6, length.out = 7)
  x_hex_outer <- 0.5 + 0.5 * cos(angle)
  y_hex_outer <- 0.5 + 0.5 * sin(angle)
  x_hex_inner <- 0.5 + 0.25 * cos(rev(angle))
  y_hex_inner <- 0.5 + 0.25 * sin(rev(angle))
  gp <- gpar(lwd = 0, col = NA, fill = "white")
  masker <- grid::pathGrob(x = c(x_hex_outer, x_hex_inner),
    y = c(y_hex_outer, y_hex_inner),
    id = rep(1:2, each = 7),
    rule = "evenodd", gp = gp)
  masked <- alphaMaskGrob(maskee, masker, use.R4.1.masks = FALSE)
  grid.newpage()
  grid.draw(masked)

  maskee_transparent <- rectGrob(gp = gpar(col = NA, fill = "blue"))
  gp <- gpar(lwd = 20, col = "black", fill = grDevices::rgb(0, 0, 0, 0.5))
  masker_transparent <- editGrob(masker, gp = gp)
  masked_transparent <- alphaMaskGrob(maskee_transparent,
```
clippingPathGrob

Clip grob using another grob to specify the clipping path

Description
clippingPathGrob() clips a grob using another grob to specify the clipping path

Usage
clippingPathGrob(
  clippee,
  clipper,
  use_R4.1_clipping = getOption("ggpattern_use_R4.1_clipping",
    getOption("ggpattern_use_R4.1_features")),
  png_device = NULL,
  res = getOption("ggpattern_res", 72),
  name = NULL,
  gp = gpar(),
  vp = NULL
)

Arguments
clippee  Grob to be clipped
clipper  Grob that defines clipping region
use_R4.1_clipping  If TRUE use the grid clipping path feature introduced in R v4.1.0. If FALSE do a rasterGrob approximation. If NULL try to guess an appropriate choice. Note not all graphic devices support the grid clipping path feature and the grid clipping path feature does not nest.
png_device  "png" graphics device to use if use_R4.1_clipping is FALSE. If NULL (default) will use ragg::agg_png() if the suggested package ragg is available else grDevices::png()
res  Resolution of desired rasterGrob in pixels per inch if use_R4.1_clipping is FALSE.
name  A character identifier.
gp  An object of class "gpar", typically the output from a call to the function gpar. This is basically a list of graphical parameter settings.
vp  A Grid viewport object (or NULL).
Value

A grid grob

Examples

```r
if (capabilities("png") && require("grid")) {
  clippee <- patternGrob("circle", gp = gpar(col = "black", fill = "yellow"),
                        spacing = 0.1, density = 0.5)
  angle <- seq(2 * pi / 4, by = 2 * pi / 6, length.out = 7)
  x_hex_outer <- 0.5 + 0.5 * cos(angle)
  y_hex_outer <- 0.5 + 0.5 * sin(angle)
  x_hex_inner <- 0.5 + 0.25 * cos(rev(angle))
  y_hex_inner <- 0.5 + 0.25 * sin(rev(angle))
  clipper <- grid::pathGrob(x = c(x_hex_outer, x_hex_inner),
                           y = c(y_hex_outer, y_hex_inner),
                           id = rep(1:2, each = 7),
                           rule = "evenodd")
  clipped <- clippingPathGrob(clippee, clipper, use.R4.1.clipping = FALSE)
  grid.newpage()
  grid.draw(clipped)
}
```

grid.pattern

Create patterned grobs

description

grid.pattern() draws patterned shapes onto the graphic device. patternGrob() returns the grid grob objects. names_pattern is a character vector of builtin patterns.

Usage

grid.pattern(
  pattern = "stripe",
  x = c(0, 0, 1, 1),
  y = c(1, 0, 0, 1),
  id = 1L,
  ..., 
  legend = FALSE,
  prefix = "pattern_",
  default.units = "npc",
  name = NULL,
  gp = gpar(),
  draw = TRUE,
  vp = NULL
)

names_pattern
patternGrob(
  pattern = "stripe",
  x = c(0, 0, 1, 1),
  y = c(1, 0, 0, 1),
  id = 1L,
  ...,
  legend = FALSE,
  prefix = "pattern_",
  default.units = "npc",
  name = NULL,
  gp = gpar(),
  draw = TRUE,
  vp = NULL
)

Arguments

pattern  Name of pattern. See Details section for a list of supported patterns.
x        A numeric vector or unit object specifying x-locations of the pattern boundary.
y        A numeric vector or unit object specifying y-locations of the pattern boundary.
id        A numeric vector used to separate locations in x, y into multiple boundaries. All locations within the same id belong to the same boundary.
...    Pattern parameters.
legend   Whether this is intended to be drawn in a legend or not.
prefix   Prefix to prepend to the name of each of the pattern parameters in .... For compatibility with ggpattern most underlying functions assume parameters beginning with pattern_.
default.units A string indicating the default units to use if x or y are only given as numeric vectors.
name     A character identifier.
gp       An object of class "gpar", typically the output from a call to the function gpar. This is basically a list of graphical parameter settings.
draw     A logical value indicating whether graphics output should be produced.
vp        A Grid viewport object (or NULL).

Format

An object of class character of length 17.

Details

Here is a list of the various patterns supported:

ambient Noise array patterns onto the graphic device powered by the ambient package. See grid.pattern_ambient() for more information.
circle Circle geometry patterns. See grid.pattern_circle() for more information.
crosshatch Crosshatch geometry patterns. See grid.pattern_crosshatch() for more information.
gradients Gradient array/geometry patterns. See grid.pattern_gradient() for more information.
image Image array patterns. See grid.pattern_image() for more information.
imagick imagemagick array patterns. See grid.pattern_imagick() for more information.
none Does nothing. See grid::grid.null() for more information.
pch Plotting character geometry patterns. See grid.pattern_pch() for more information.
placeholder Placeholder image array patterns. See grid.pattern_placeholder() for more information.
plasma Plasma array patterns. See grid.pattern_plasma() for more information.
polygon_tiling Polygon tiling patterns. See grid.pattern_polygon_tiling() for more information.
regular_polygon Regular polygon patterns. See grid.pattern_regular_polygon() for more information.
rose Rose array/geometry patterns. See grid.pattern_rose() for more information.
stripes Stripe array/geometry patterns. See grid.pattern_stripe() for more information.
text Text array/geometry patterns. See grid.pattern_text() for more information.
waves Wave geometry patterns. See grid.pattern_wave() for more information.
weaves Weave array/geometry patterns. See grid.pattern_weave() for more information.

Custom geometry-based patterns See https://trevorldavis.com/R/gridpattern/dev/articles/developing-patterns.html for more information.

Custom array-based patterns See https://trevorldavis.com/R/gridpattern/dev/articles/developing-patterns.html for more information.

Value

A grid grob object (invisibly in the case of grid.pattern()). If draw is TRUE then grid.pattern() also draws to the graphic device as a side effect.

See Also


Examples

print(names_pattern)
if (require("grid")) {
  x_hex <- 0.5 + 0.5 * cos(seq(2 * pi / 4, by = 2 * pi / 6, length.out = 6))
  y_hex <- 0.5 + 0.5 * sin(seq(2 * pi / 4, by = 2 * pi / 6, length.out = 6))

  # geometry-based patterns
# 'stripe' pattern
grid.newpage()
grid.pattern("stripe", x_hex, y_hex,
  colour="black", fill=c("yellow", "blue"), density = 0.5)

# Can alternatively use "gpar()" to specify colour and line attributes
grid.newpage()
grid.pattern("stripe", x_hex, y_hex, gp = gpar(col="blue", fill="red", lwd=2))

# 'weave' pattern
grid.newpage()
grid.pattern("weave", x_hex, y_hex, type = "satin",
  colour = "black", fill = "lightblue", fill2 = "yellow",
  density = 0.3)

# 'regular_polygon' pattern
grid.newpage()
grid.pattern_regular_polygon(x_hex, y_hex, colour = "black",
  fill = c("blue", "yellow", "red"), shape = c("convex4", "star8", "circle"),
  density = c(0.45, 0.42, 0.4), spacing = 0.08, angle = 0)

# can be used to achieve a variety of 'tiling' effects
grid.newpage()
grid.pattern_regular_polygon(x_hex, y_hex, color = "transparent",
  fill = c("white", "grey", "black"),
  density = 1.0, spacing = 0.1,
  shape = "convex6", grid = "hex")

if (require("magick")) {
  # array-based patterns
  # 'image' pattern
  logo_filename <- system.file("img", "Rlogo.png", package="png")
  grid.newpage()
  grid.pattern("image", x_hex, y_hex, filename=logo_filename, type="fit")

  # 'plasma' pattern
  grid.newpage()
  grid.pattern("plasma", x_hex, y_hex, fill="green")
}

---

grid.pattern_ambient  Ambient patterned grobs

**Description**

grid.pattern_ambient() draws noise patterns onto the graphic device powered by the ambient package.
grid.pattern_ambient

Usage

grid.pattern_ambient(
  x = c(0, 0, 1, 1),
  y = c(1, 0, 0, 1),
  id = 1L,
  ...
  type = "simplex",
  fill = gp$fill %||% "grey80",
  fill2 = "#4169E1",
  frequency = 0.01,
  interpolator = "quintic",
  fractal = switch(type, worley = "none", "fbm"),
  octaves = 3,
  lacunarity = 2,
  gain = 0.5,
  pertubation = "none",
  pertubation_amplitude = 1,
  value = "cell",
  distance_ind = c(1, 2),
  jitter = 0.45,
  res = getOption("ggpattern_res", 72),
  alpha = NA_real_,
  default.units = "npc",
  name = NULL,
  gp = gpar(),
  draw = TRUE,
  vp = NULL
)

Arguments

- **x**: A numeric vector or unit object specifying x-locations of the pattern boundary.
- **y**: A numeric vector or unit object specifying y-locations of the pattern boundary.
- **id**: A numeric vector used to separate locations in x, y into multiple boundaries. All locations within the same id belong to the same boundary.
- **type**: Either cubic, perlin, simplex, value, white, or worley
- **fill**: Fill colour
- **fill2**: Second colour
- **frequency**: Determines the granularity of the features in the noise.
- **interpolator**: How should values between sampled points be calculated? Either 'linear', 'hermite', or 'quintic' (default), ranging from lowest to highest quality.
- **fractal**: The fractal type to use. Either 'none', 'fbm' (default), 'billow', or 'rigid-multi'. It is suggested that you experiment with the different types to get a feel for how they behaves.
octaves
  The number of noise layers used to create the fractal noise. Ignored if fractal = 'none'. Defaults to 3.

lacunarity
  The frequency multiplier between successive noise layers when building fractal noise. Ignored if fractal = 'none'. Defaults to 2.

gain
  The relative strength between successive noise layers when building fractal noise. Ignored if fractal = 'none'. Defaults to 0.5.

perturbation
  The perturbation to use. Either 'none' (default), 'normal', or 'fractal'. Defines the displacement (warping) of the noise, with 'normal' giving a smooth warping and 'fractal' giving a more erratic warping.

perturbation_amplitude
  The maximal perturbation distance from the origin. Ignored if perturbation = 'none'. Defaults to 1.

value
  The noise value to return. Either
  • 'value' (default) A random value associated with the closest point
  • 'distance' The distance to the closest point
  • 'distance2' The distance to the nth closest point (n given by distance_ind[1])
  • 'distance2add' Addition of the distance to the nth and mth closest point given in distance_ind
  • 'distance2sub' Subtraction of the distance to the nth and mth closest point given in distance_ind
  • 'distance2mul' Multiplication of the distance to the nth and mth closest point given in distance_ind
  • 'distance2div' Division of the distance to the nth and mth closest point given in distance_ind

distance_ind
  Reference to the nth and mth closest points that should be used when calculating value.

jitter
  The maximum distance a point can move from its start position during sampling of cell points.

res
  Assumed resolution (in pixels per graphic device inch) to use when creating array pattern.

alpha
  Alpha (between 0 and 1) or NA (default, preserves colors' alpha value).

default.units
  A string indicating the default units to use if x or y are only given as numeric vectors.

name
  A character identifier.

gp
  An object of class "gpar", typically the output from a call to the function gpar. This is basically a list of graphical parameter settings.

draw
  A logical value indicating whether graphics output should be produced.

vp
  A Grid viewport object (or NULL).

Value
  A grid grob object invisibly. If draw is TRUE then also draws to the graphic device as a side effect.
See Also

For more information about the noise types please see the relevant ambient documentation: ambient::noise_cubic(), ambient::noise_perlin(), ambient::noise_simplex(), ambient::noise_value(), ambient::noise_white(), and ambient::noise_worley(). grid.pattern_plasma() provides an alternative noise pattern that depends on magick.

Examples

```r
if (requireNamespace("ambient")) {
  x_hex <- 0.5 + 0.5 * cos(seq(2 * pi / 4, by = 2 * pi / 6, length.out = 6))
  y_hex <- 0.5 + 0.5 * sin(seq(2 * pi / 4, by = 2 * pi / 6, length.out = 6))
  grid.pattern_ambient(x_hex, y_hex, fill = "green", fill2 = "blue")
  grid::grid.newpage()
  grid.pattern_ambient(x_hex, y_hex, fill = "green", fill2 = "blue", type = "cubic")
}
```

grid.pattern_circle  Circle patterned grobs

Description

grid.pattern_circle() draws a circle pattern onto the graphic device.

Usage

```r
grid.pattern_circle(
  x = c(0, 0, 1, 1),
  y = c(1, 0, 0, 1),
  id = 1L,
  ...
  colour = gp$col || "grey20",
  fill = gp$fill || "grey80",
  angle = 30,
  density = 0.2,
  spacing = 0.05,
  xoffset = 0,
  yoffset = 0,
  alpha = gp$alpha || NA_real_,
  linetype = gp$lty || 1,
  size = gp$lwd || 1,
  grid = "square",
  type = NULL,
  subtype = NULL,
  default.units = "npc",
  name = NULL,
  gp = gpar(),
  draw = TRUE,
)```
grid.pattern_circle

vp = NULL
)

Arguments

x  A numeric vector or unit object specifying x-locations of the pattern boundary.
y  A numeric vector or unit object specifying y-locations of the pattern boundary.
id  A numeric vector used to separate locations in x, y into multiple boundaries. All locations within the same id belong to the same boundary.
...  Currently ignored
colour  Stroke colour
fill  Fill colour
angle  Rotation angle in degrees
density  Approx. fraction of area the pattern fills.
spacing  Spacing between repetitions of pattern ('snpc' units between 0 and 1).
xoffset  Shift pattern along x axis ('snpc' units between 0 and 1).
yoffset  Shift pattern along y axis ('snpc' units between 0 and 1).
alpha  Alpha (between 0 and 1) or NA (default, preserves colors' alpha value).
linetype  Stroke linetype
size  Stroke linewidth
grid  Adjusts placement and density of certain graphical elements. "square" (default) is a square grid. "hex" is a hexagonal grid suitable for hexagonal and triangular tiling. "hex_circle" is a hexagonal grid suitable for circle packing. "elongated_triangle" is a grid used for the "elongated triangle" tiling.
type  Adjusts the repeating of certain aesthetics such as color. Can use any type in names_hex, names_square, or names_weave. See for pattern_hex(), pattern_square(), and pattern_weave() for more information about supported type arguments.
subtype  See for pattern_hex(), pattern_square(), and pattern_weave() for more information about supported subtype arguments.
default.units  A string indicating the default units to use if x or y are only given as numeric vectors.
name  A character identifier.
gp  An object of class "gpar", typically the output from a call to the function gpar. This is basically a list of graphical parameter settings.
draw  A logical value indicating whether graphics output should be produced.
vp  A Grid viewport object (or NULL).

Value

A grid grob object invisibly. If draw is TRUE then also draws to the graphic device as a side effect.

See Also

See grid.pattern_regular_polygon() for a more general case of this pattern.
Examples

```r
if (require("grid")) {
  x_hex <- 0.5 + 0.5 * cos(seq(2 * pi / 4, by = 2 * pi / 6, length.out = 6))
  y_hex <- 0.5 + 0.5 * sin(seq(2 * pi / 4, by = 2 * pi / 6, length.out = 6))
  grid.pattern.circle(x_hex, y_hex, fill = c("blue", "yellow"), density = 0.5)
  grid.newpage()
  grid.pattern.circle(x_hex, y_hex, density = 0.8, grid = "hex_circle",
                      gp = gpar(fill = c("blue", "yellow", "red")))
  grid.newpage()
  grid.pattern.circle(x_hex, y_hex, density = 1.2, grid = "hex_circle",
                      gp = gpar(fill = c("blue", "yellow", "red")))

  # using a "twill_zigzag" 'weave' pattern
  grid.newpage()
  grid.pattern.circle(x_hex, y_hex, fill = "blue", density = 0.5, type = "twill_zigzag")
}
```

grid.pattern.crosshatch

Crosshatch patterned grobs

Description

`grid.pattern.crosshatch()` draws a crosshatch pattern onto the graphic device.

Usage

```r
grid.pattern.crosshatch(
  x = c(0, 0, 1, 1),
  y = c(1, 0, 0, 1),
  id = 1L,
  ..., colour = gp$col || "grey20",
  fill = gp$fill || "grey80",
  fill2 = fill,
  angle = 30,
  density = 0.2,
  spacing = 0.05,
  xoffset = 0,
  yoffset = 0,
  alpha = gp$alpha || NA_real_,
  linetype = gp$lty || 1,
  size = gp$lwd || 1,
  grid = "square",
  default.units = "npc",
  name = NULL,
  gp = gpar(),
  draw = TRUE,
)```
vp = NULL
)

Arguments

x A numeric vector or unit object specifying x-locations of the pattern boundary.
y A numeric vector or unit object specifying y-locations of the pattern boundary.
id A numeric vector used to separate locations in x, y into multiple boundaries. All locations within the same id belong to the same boundary.
... Currently ignored
colour Stroke colour
fill Fill colour
fill2 The fill colour for the “top” crosshatch lines.
angle Rotation angle in degrees
density Approx. fraction of area the pattern fills.
spacing Spacing between repetitions of pattern (‘snpc’ units between 0 and 1).
xoffset Shift pattern along x axis (‘snpc’ units between 0 and 1).
yoffset Shift pattern along y axis (‘snpc’ units between 0 and 1).
alpha Alpha (between 0 and 1) or NA (default, preserves colors’ alpha value).
linetype Stroke linetype
size Stroke linewidth
grid Adjusts placement and density of certain graphical elements. "square" (default) is a square grid. "hex" is a hexagonal grid suitable for hexagonal and triangular tiling. "hex_circle" is a hexagonal grid suitable for circle packing. "elongated_triangle" is a grid used for the "elongated triangle" tiling.
default.units A string indicating the default units to use if x or y are only given as numeric vectors.
name A character identifier.
gp An object of class "gpar", typically the output from a call to the function gpar. This is basically a list of graphical parameter settings.
draw A logical value indicating whether graphics output should be produced.
vp A Grid viewport object (or NULL).

Value

A grid grob object invisibly. If draw is TRUE then also draws to the graphic device as a side effect.

See Also

grid.pattern_weave() which interweaves two sets of lines. For a single set of lines use grid.pattern_stripe().
Examples

```r
if (require("grid")) {
  x_hex <- 0.5 + 0.5 * cos(seq(2 * pi / 4, by = 2 * pi / 6, length.out = 6))
  y_hex <- 0.5 + 0.5 * sin(seq(2 * pi / 4, by = 2 * pi / 6, length.out = 6))
  grid.pattern_crosshatch(x_hex, y_hex, colour = "black", fill = "blue",
                          fill2 = "yellow", density = 0.5)
  grid.newpage()
  grid.pattern_crosshatch(x_hex, y_hex, density = 0.3,
                          gp = gpar(col = "blue", fill = "yellow"))
}
```

---

**grid.pattern_gradient**  Gradient patterned grobs

Description

`grid.pattern_gradient()` draws a gradient pattern onto the graphic device.

Usage

```r
grid.pattern_gradient(
  x = c(0, 0, 1, 1),
  y = c(1, 0, 0, 1),
  id = 1L,
  ...
  fill = gp$fill %||% "grey80",
  fill2 = "#4169E1",
  orientation = "vertical",
  alpha = gp$alpha %||% NA_real_,
  use_R4.1_gradients =getOption("ggpattern_use_R4.1_gradients",
    getOption("ggpattern_use_R4.1_features")),
  aspect_ratio = 1,
  key_scale_factor = 1,
  res = getOption("ggpattern_res", 72),
  default.units = "npc",
  name = NULL,
  gp = gpar(),
  draw = TRUE,
  vp = NULL
)
```

Arguments

- `x` A numeric vector or unit object specifying x-locations of the pattern boundary.
- `y` A numeric vector or unit object specifying y-locations of the pattern boundary.
- `id` A numeric vector used to separate locations in x, y into multiple boundaries. All locations within the same id belong to the same boundary.
grid.pattern_image

... Currently ignored
fill Fill colour
fill2 Second colour
orientation vertical, horizontal, or radial
alpha Alpha (between 0 and 1) or NA (default, preserves colors’ alpha value).
use.R4.1.gradients Whether to use the gradient feature introduced in R v4.1 or use a rasterGrob approximation. Note not all graphic devices support the grid gradient feature.
aspect_ratio Override aspect ratio
key_scale_factor Additional scale factor for legend
res Assumed resolution (in pixels per graphic device inch) to use when creating array pattern.
default.units A string indicating the default units to use if x or y are only given as numeric vectors.
name A character identifier.
gp An object of class "gpar", typically the output from a call to the function gpar. This is basically a list of graphical parameter settings.
draw A logical value indicating whether graphics output should be produced.
vp A Grid viewport object (or NULL).

Value
A grid grob object invisibly. If draw is TRUE then also draws to the graphic device as a side effect.

Examples
if (require("grid") && require("magick") && capabilities("png")) {
  x_hex <- 0.5 + 0.5 * cos(seq(2 * pi / 4, by = 2 * pi / 6, length.out = 6))
  y_hex <- 0.5 + 0.5 * sin(seq(2 * pi / 4, by = 2 * pi / 6, length.out = 6))
  grid.pattern_gradient(x_hex, y_hex, fill = "green")
  grid.newpage()
  grid.pattern_gradient(x_hex, y_hex, fill = "green", orientation = "radial")
}

grid.pattern_image Image patterned grobs

Description
grid.pattern_image() draws an image pattern onto the graphic device.
Usage

grid.pattern_image(
  x = c(0, 0, 1, 1),
  y = c(1, 0, 0, 1),
  id = 1L,
  filename = "",
  type = "fit",
  scale = 1,
  gravity = switch(type, tile = "southwest", "center"),
  filter = "lanczos",
  alpha = gp$alpha %||% NA_real,
  aspect_ratio = 1,
  key_scale_factor = 1,
  res = getOption("ggpattern_res", 72),
  default.units = "npc",
  name = NULL,
  gp = gpar(),
  draw = TRUE,
  vp = NULL
)

Arguments

x A numeric vector or unit object specifying x-locations of the pattern boundary.
y A numeric vector or unit object specifying y-locations of the pattern boundary.
id A numeric vector used to separate locations in x, y into multiple boundaries. All
locations within the same id belong to the same boundary.
... Currently ignored
filename Image of filename or URL
type Image scaling type
scale Extra scaling
gravity Position of image within area. magick::gravity_types() returns a vector of
supported values.
filter Filter to use when scaling. magick::filter_types() returns a vector of sup-
ported values.
alpha Alpha (between 0 and 1) or NA (default, preserves colors’ alpha value).
aspect_ratio Override aspect ratio
key_scale_factor Additional scale factor for legend
res Assumed resolution (in pixels per graphic device inch) to use when creating
array pattern.
default.units A string indicating the default units to use if x or y are only given as numeric
vectors.
name  A character identifier.
gp    An object of class "gpar", typically the output from a call to the function \texttt{gpar}. This is basically a list of graphical parameter settings.
draw  A logical value indicating whether graphics output should be produced.
vp    A Grid viewport object (or NULL).

Details

Here is a description of the \texttt{type} arguments:

- \textbf{expand}  Scale the image beyond the bounding box and crop it such that the image fully covers the width and the height of the region.
- \textbf{fit}    Scale the image such that either the width or the height of the image fits in the bounding box. Affected by \texttt{gravity}
- \textbf{none}    Position a single image in the region without attempting to scale to the bounding box size. Affected by \texttt{scale} and \texttt{gravity}.
- \textbf{squish}  Distort the image to cover the bounding box of the region.
- \textbf{tile}    Repeat the image to cover the bounding box. Affected by \texttt{tile}.

Value

A grid grob object invisibly. If \texttt{draw} is \texttt{TRUE} then also draws to the graphic device as a side effect.

See Also

\texttt{grid.pattern_placeholder()} is an image pattern that uses images downloaded from the internet.

Examples

```r
if (require("magick")) {
  x_hex <- 0.5 + 0.5 * cos(seq(2 * pi / 4, by = 2 * pi / 6, length.out = 6))
  y_hex <- 0.5 + 0.5 * sin(seq(2 * pi / 4, by = 2 * pi / 6, length.out = 6))
  logo_filename <- system.file("img", "Rlogo.png", package = "png")
  grid.pattern_image(x_hex, y_hex, filename = logo_filename, type = "fit")

  # "tile" 'type' image pattern depends on 'magick' functionality
  # which is not reliable across platforms
  grid::grid.newpage()
  try(grid.pattern_image(x_hex, y_hex, filename = logo_filename,
                         type = "tile"))
}
```
grid.pattern_magick

Magick patterned grobs

Description

grid.pattern_magick() draws a imagemagick pattern onto the graphic device. names_magick, names_magick_intensity, and names_magick_stripe are character vectors of supported type values plus subsets for shaded intensity and stripes.

Usage

grid.pattern_magick(
  x = c(0, 0, 1, 1),
  y = c(1, 0, 0, 1),
  id = 1L,
  ...
)

Arguments

x A numeric vector or unit object specifying x-locations of the pattern boundary.
y A numeric vector or unit object specifying y-locations of the pattern boundary.
id A numeric vector used to separate locations in x, y into multiple boundaries. All locations within the same id belong to the same boundary.
... Currently ignored
grid.pattern_magick

type Magick pattern types. names_magick, names_magick_intensity, and names_magick_stripe are character vectors of supported type values plus subsets for shaded intensity and stripes.

fill Fill colour

scale Extra scaling

filter Filter to use when scaling. magick::filter_types() returns a vector of supported values.

alpha Alpha (between 0 and 1) or NA (default, preserves colors' alpha value).

aspect_ratio Override aspect ratio

key_scale_factor Additional scale factor for legend

res Assumed resolution (in pixels per graphic device inch) to use when creating array pattern.

default.units A string indicating the default units to use if x or y are only given as numeric vectors.

name A character identifier.

gp An object of class "gpar". typically the output from a call to the function gpar. This is basically a list of graphical parameter settings.

draw A logical value indicating whether graphics output should be produced.

vp A Grid viewport object (or NULL).

Format

An object of class character of length 54.
An object of class character of length 21.
An object of class character of length 19.

Value

A grid grob object invisibly. If draw is TRUE then also draws to the graphic device as a side effect.

See Also

The imagemagick documentation http://www.imagemagick.org/script/formats.php for more information.

Examples

if (require("magick")) {
  x_hex <- 0.5 + 0.5 * cos(seq(2 * pi / 4, by = 2 * pi / 6, length.out = 6))
  y_hex <- 0.5 + 0.5 * sin(seq(2 * pi / 4, by = 2 * pi / 6, length.out = 6))
  grid.pattern_magick(x_hex, y_hex, type="octagons", fill="blue", scale=2)
}

# supported magick pattern names
print(names_magick)
grid.pattern_pch

Plotting character patterned grobs

Description

grid.pattern_pch() draws a plotting character pattern onto the graphic device.

Usage

grid.pattern_pch(
  x = c(0, 0, 1, 1),
  y = c(1, 0, 0, 1),
  id = 1L,
  ..., 
  colour = gp$col %||% "grey20",
  fill = gp$fill %||% "grey80",
  angle = 30,
  density = 0.2,
  spacing = 0.05,
  xoffset = 0,
  yoffset = 0,
  scale = 0.5,
  shape = 1L,
  grid = "square",
  type = NULL,
  subtype = NULL,
  rot = 0,
  alpha = gp$alpha %||% NA_real_,
  linetype = gp$lty %||% 1,
  size = gp$lwd %||% 1,
  default.units = "npc",
  name = NULL,
  gp = gpar(),
  draw = TRUE,
  vp = NULL
)

Arguments

x A numeric vector or unit object specifying x-locations of the pattern boundary.

y A numeric vector or unit object specifying y-locations of the pattern boundary.

id A numeric vector used to separate locations in x, y into multiple boundaries. All locations within the same id belong to the same boundary.

... Currently ignored

colour Stroke colour
fill Fill colour
angle Rotation angle in degrees
density Approx. fraction of area the pattern fills.
spacing Spacing between repetitions of pattern ("snpc" units between 0 and 1).
xoffset Shift pattern along x axis ("snpc" units between 0 and 1).
yoffset Shift pattern along y axis ("snpc" units between 0 and 1).
scale For star polygons, multiplier (between 0 and 1) applied to exterior radius to get interior radius.
shape An integer from 0 to 25 or NA. See graphics::points() for more details. Note we only support these shapes and do not support arbitrary ASCII / Unicode characters.
grid Adjusts placement and density of certain graphical elements. "square" (default) is a square grid. "hex" is a hexagonal grid suitable for hexagonal and triangular tiling. "hex_circle" is a hexagonal grid suitable for circle packing. "elongated_triangle" is a grid used for the "elongated triangle" tiling.
type Adjusts the repeating of certain aesthetics such as color. Can use any type in names_hex, names_square, or names_weave. See for pattern_hex(), pattern_square(), and pattern_weave() for more information about supported type arguments.
subtype See for pattern_hex(), pattern_square(), and pattern_weave() for more information about supported subtype arguments.
rot Angle to rotate regular polygon (degrees, counter-clockwise).
alpha Alpha (between 0 and 1) or NA (default, preserves colors’ alpha value).
linetype Stroke linetype
size Stroke linewidth
default.units A string indicating the default units to use if x or y are only given as numeric vectors.
name A character identifier.
gp An object of class "gpar", typically the output from a call to the function gpar. This is basically a list of graphical parameter settings.
draw A logical value indicating whether graphics output should be produced.
vp A Grid viewport object (or NULL).

Value
A grid grob object invisibly. If draw is TRUE then also draws to the graphic device as a side effect.

See Also
grid.pattern_regular_polygon() which is used to implement this pattern.
Examples

```r
if (require("grid")) {
  x_hex <- 0.5 + 0.5 * cos(seq(2 * pi / 4, by = 2 * pi / 6, length.out = 6))
  y_hex <- 0.5 + 0.5 * sin(seq(2 * pi / 4, by = 2 * pi / 6, length.out = 6))
  gp <- gpar(col = "black", fill = "lightblue")

  # pch 0-6 are simple shapes with no fill
  grid.pattern_pch(x_hex, y_hex, shape = 0:6, gp = gp,
                    spacing = 0.1, density = 0.4, angle = 0)

  # pch 7-14 are compound shapes with no fill
  grid.newpage()
  grid.pattern_pch(x_hex, y_hex, shape = 7:14, gp = gp,
                   spacing = 0.1, density = 0.4, angle = 0)

  # pch 15-20 are filled with 'col'
  grid.newpage()
  grid.pattern_pch(x_hex, y_hex, shape = 15:20, gp = gp,
                   spacing = 0.1, density = 0.4, angle = 0)

  # pch 21-25 are filled with 'fill'
  grid.newpage()
  grid.pattern_pch(x_hex, y_hex, shape = 21:25, gp = gp,
                   spacing = 0.1, density = 0.4, angle = 0)

  # using a 'basked' weave 'type' with two shapes
  grid.newpage()
  grid.pattern_pch(x_hex, y_hex, shape = c(1,4), gp = gp,
                   type = "basket",
                   spacing = 0.1, density = 0.4, angle = 0)
}
```

grid.pattern_placeholder

---

**Description**

`grid.pattern_placeholder()` draws a placeholder image pattern onto the graphic device. `names_placeholder` are character vectors of supported placeholder types.

**Usage**

```r
grid.pattern_placeholder(
  x = c(0, 0, 1, 1),
  y = c(1, 0, 0, 1),
  id = 1L,
  ...,
  type = "kitten",
)```
alpha = gp$alpha || NA_real_,
aspect_ratio = 1,
key_scale_factor = 1,
res =getOption("ggpattern_res", 72),
default.units = "npc",
name = NULL,
gp = gpar(),
draw = TRUE,
vp = NULL
)

Arguments

x A numeric vector or unit object specifying x-locations of the pattern boundary.
y A numeric vector or unit object specifying y-locations of the pattern boundary.
id A numeric vector used to separate locations in x, y into multiple boundaries. All locations within the same id belong to the same boundary.
... Currently ignored
type Image source. names_placeholder is a vector of supported values. If you would like only greyscale images append bw to the name.
alpha Alpha (between 0 and 1) or NA (default, preserves colors’ alpha value).
aspect_ratio Override aspect ratio
key_scale_factor Additional scale factor for legend
res Assumed resolution (in pixels per graphic device inch) to use when creating array pattern.
default.units A string indicating the default units to use if x or y are only given as numeric vectors.
name A character identifier.
gp An object of class "gpar", typically the output from a call to the function gpar. This is basically a list of graphical parameter settings.
draw A logical value indicating whether graphics output should be produced.
vp A Grid viewport object (or NULL).

Format

An object of class character of length 26.

Value

A grid grob object invisibly. If draw is TRUE then also draws to the graphic device as a side effect.
Examples

```r
if (require("magick")) {
  x_hex <- 0.5 + 0.5 * cos(seq(2 * pi / 4, by = 2 * pi / 6, length.out = 6))
  y_hex <- 0.5 + 0.5 * sin(seq(2 * pi / 4, by = 2 * pi / 6, length.out = 6))
  # requires internet connection to download from placeholder image websites
  try(grid.pattern_placeholder(x_hex, y_hex, type="bear"))
}

print(names_placeholder)
```

---

**grid.pattern_plasma**  
*Plasma patterned grobs*

**Description**

`grid.pattern_plasma()` draws a plasma pattern onto the graphic device.

**Usage**

```r
grid.pattern_plasma(
  x = c(0, 0, 1, 1),
  y = c(1, 0, 0, 1),
  id = 1L,
  ...,  
  fill = gp$fill %||% "grey80",
  scale = 1,
  alpha = gp$alpha %||% NA_real_,
  aspect_ratio = 1,
  key_scale_factor = 1,
  res =getOption("ggpattern_res", 72),
  default.units = "npc",
  name = NULL,
  gp = gpar(),
  draw = TRUE,
  vp = NULL
)
```

**Arguments**

- `x` A numeric vector or unit object specifying x-locations of the pattern boundary.
- `y` A numeric vector or unit object specifying y-locations of the pattern boundary.
- `id` A numeric vector used to separate locations in x, y into multiple boundaries. All locations within the same id belong to the same boundary.
- `...` Currently ignored
- `fill` Fill colour
- `scale` Extra scaling
grid.pattern_polygon_tiling

alpha       Alpha (between 0 and 1) or NA (default, preserves colors’ alpha value).
aspect_ratio Override aspect ratio
key_scale_factor Additional scale factor for legend
res         Assumed resolution (in pixels per graphic device inch) to use when creating array pattern.
default.units A string indicating the default units to use if x or y are only given as numeric vectors.
name        A character identifier.
gp          An object of class "gpar", typically the output from a call to the function gpar. This is basically a list of graphical parameter settings.
draw        A logical value indicating whether graphics output should be produced.
vp           A Grid viewport object (or NULL).

Value
A grid grob object invisibly. If draw is TRUE then also draws to the graphic device as a side effect.

See Also
grid.pattern_ambient() provides a noise pattern using the ambient package.

Examples
if (require("magick")) {
  x_hex <- 0.5 + 0.5 * cos(seq(2 * pi / 4, by = 2 * pi / 6, length.out = 6))
  y_hex <- 0.5 + 0.5 * sin(seq(2 * pi / 4, by = 2 * pi / 6, length.out = 6))
  grid.pattern_plasma(x_hex, y_hex, fill = "green")
}

grid.pattern_polygon_tiling

Polygon tiling patterned grobs

Description
grid.pattern_polygon_tiling() draws a specified polygon tiling pattern onto the graphic device. names_polygon_tiling lists all supported types.
Usage

```
grid.pattern_polygon_tiling(
  x = c(0, 0, 1, 1),
  y = c(1, 0, 0, 1),
  id = 1L,
  ...
  colour = gp$col %||% "grey20",
  fill = gp$fill %||% "grey80",
  angle = 30,
  spacing = 0.05,
  xoffset = 0,
  yoffset = 0,
  type = "square",
  alpha = gp$alpha %||% NA_real_,
  linetype = gp$lty %||% 1,
  size = gp$lwd %||% 1,
  default.units = "npc",
  name = NULL,
  gp = gpar(),
  draw = TRUE,
  vp = NULL
)
```

names_polygon_tiling

Arguments

- **x**: A numeric vector or unit object specifying x-locations of the pattern boundary.
- **y**: A numeric vector or unit object specifying y-locations of the pattern boundary.
- **id**: A numeric vector used to separate locations in x, y into multiple boundaries. All locations within the same id belong to the same boundary.
- **...**: Currently ignored
- **colour**: Stroke colour
- **fill**: Fill colour
- **angle**: Rotation angle in degrees
- **spacing**: Spacing between repetitions of pattern (‘snpc’ units between 0 and 1).
- **xoffset**: Shift pattern along x axis (‘snpc’ units between 0 and 1).
- **yoffset**: Shift pattern along y axis (‘snpc’ units between 0 and 1).
- **type**: Name of polygon tiling to draw. See Details.
- **alpha**: Alpha (between 0 and 1) or NA (default, preserves colors’ alpha value). Not supported for all polygon tiling type.
- **linetype**: Stroke linetype
- **size**: Stroke linewidth
default.units  A string indicating the default units to use if x or y are only given as numeric vectors.

name  A character identifier.

gp  An object of class "gpar", typically the output from a call to the function gp. This is basically a list of graphical parameter settings.

draw  A logical value indicating whether graphics output should be produced.

vp  A Grid viewport object (or NULL).

Format

An object of class character of length 36.

Details

grid.pattern_polygon_tiling() supports 1, 2, or 3 fill colors with the first colors (weakly) covering a larger area. Size of the pattern is controlled by spacing. We support the following polygon tiling types:

- elongated_triangular  Creates an elongated triangular tiling made of squares and triangles.
- herringbone  Creates a herringbone tiling made of rectangles.
- hexagonal  Creates a hexagonal tiling made of hexagons.
- pythagorean  Creates a Pythagorean tiling made of squares of two different sizes.
- rhombille  Creates a rhombille tiling made of rhombi.
- rhombitrihexagonal  Creates a rhombitrihexagonal tiling made out of dodecagons, hexagons, and squares.
- snub_square  Creates a snub square tiling made of squares and triangles.
- snub_trihexagonal  Creates a snub trihexagonal tiling made of hexagons and triangles.
- square  Creates a square tiling made of squares.
- tetrakis_square  Creates a tetrakis square tiling made of isosceles right triangles.
- triangular  Creates a triangular tiling made of equilateral triangles.
- trihexagonal  Creates a trihexagonal tiling made of hexagons and triangles.
- truncated_square  Creates a truncated square tiling made of octagons and squares.
- truncated_hexagonal  Creates a truncated hexagonal tiling made of dodecagons and triangles.
- truncated_trihexagonal  Creates a truncated trihexagonal tiling made of hexagons, squares, and triangles.
- 2*2**2*2**  Creates a polygon tiling made of rhombi.
- 2**3**12*  Creates a polygon tiling made of rhombi, triangles, and twelve-pointed stars.
- 3.3*3**  Creates a polygon tiling made of triangles.
- 3.3*3.3**  Creates a regular (star) polygon tiling made of triangles and three-pointed stars.
- 3.3.3.12*3.3.12*  Creates a regular (star) polygon tiling made of triangles and twelve-pointed stars.
- 3.3.8*3.4.3.8*  Creates a regular (star) polygon tiling made of triangles, squares, and eight-pointed stars.
3.3.8*.4**.8* Creates a regular (star) polygon tiling made of triangles, four-pointed stars, and eight-pointed stars.

3.4.6.3.12* Creates a regular (star) polygon tiling made of triangles, squares, hexagons, and twelve-pointed stars.

3.4.8.3.8* Creates a regular (star) polygon tiling made of triangles, squares, octagons, and eight-pointed stars.

3.6*.6** Creates a regular (star) polygon tiling made of triangles and six-pointed stars.

4.2*.4.2** Creates a polygon tiling made of squares and rhombi.

4.4*.4** Creates a regular (star) polygon tiling made of squares and four-pointed stars.

4.6.4*.6 Creates a regular (star) polygon tiling made of squares, hexagons, and four-pointed stars.

4.6*.4.6*.4.6* Creates a regular (star) polygon tiling made of squares and six-pointed stars.

4.8*.4**.8* Creates a polygon tiling of squares and eight-pointed stars.

6.6*.6.6* Creates a regular (star) polygon tiling made of hexagons and six-pointed stars.

8.4*.8.4* Creates a regular (star) polygon tiling made of octagons and four-pointed stars.

9.3.9.3* Creates a regular (star) polygon tiling made of triangles, nonagons, and three-pointed stars.

12.3*.12.3* Creates a regular (star) polygon tiling made of dodecagons and three-pointed stars.

12.12.4* Creates a regular (star) polygon tiling made of dodecagons and four-pointed stars.

18.18.3* Creates a regular (star) polygon tiling made of eighteen-sided polygons and three-pointed stars.

Value

A grid grob object invisibly. If draw is TRUE then also draws to the graphic device as a side effect.

See Also

The tiling vignette vignette("tiling", package = "gridpattern") for more information about these tilings as well as more examples of polygon tiling using the grid.pattern_regular_polygon() function.

Examples

```r
print(names_polygon_tiling)
if (require("grid")) {
  x_hex <- 0.5 + 0.5 * cos(seq(2 * pi / 4, by = 2 * pi / 6, length.out = 6))
y_hex <- 0.5 + 0.5 * sin(seq(2 * pi / 4, by = 2 * pi / 6, length.out = 6))
gpl <- gpar(fill = "yellow", col = "black")
gp2 <- gpar(fill = c("yellow", "red"), col = "black")
gp3 <- gpar(fill = c("yellow", "red", "blue"), col = "black")

grid.pattern_polygon_tiling(x_hex, y_hex, type = "herringbone", gp = gpl)
grid.newpage()
grid.pattern_polygon_tiling(x_hex, y_hex, type = "hexagonal",
                           spacing = 0.2, gp = gp3)
```
grid.newpage()
grid.pattern_polygon_tiling(x_hex, y_hex, type = "pythagorean",
   spacing = 0.2, gp = gp2)

grid.newpage()
grid.pattern_polygon_tiling(x_hex, y_hex, type = "snub_trihexagonal",
   spacing = 0.2, gp = gp3)

grid.newpage()
grid.pattern_polygon_tiling(x_hex, y_hex, type = "rhombille",
   spacing = 0.2, gp = gp3)
}

grid.pattern_regular_polygon

Regular polygon patterned grobs

Description

grid.pattern_regular_polygon() draws a regular polygon pattern onto the graphic device.

Usage

grid.pattern_regular_polygon(
  x = c(0, 0, 1, 1),
  y = c(1, 0, 0, 1),
  id = 1L,
  ...,  
colour = gp$col %||% "grey20",
fill = gp$fill %||% "grey80",
angle = 30,
density = 0.2,
spacing = 0.05,
xoffset = 0,
yoffset = 0,
scale = 0.5,
shape = "convex4",
grid = "square",
type = NULL,
subtype = NULL,
rot = 0,
alpha = gp$alpha %||% NA_real_,
linetype = gp$lty %||% 1,
size = gp$lwd %||% 1,
default.units = "npc",
name = NULL,
gp = gpar(),

```r
grid.pattern_regular_polygon

Arguments

x
A numeric vector or unit object specifying x-locations of the pattern boundary.

y
A numeric vector or unit object specifying y-locations of the pattern boundary.

id
A numeric vector used to separate locations in x, y into multiple boundaries. All locations within the same id belong to the same boundary.

... Currently ignored

colour
Stroke colour

fill
Fill colour

angle
Rotation angle in degrees

density
Approx. fraction of area the pattern fills.

spacing
Spacing between repetitions of pattern (‘snpc’ units between 0 and 1).

xoffset
Shift pattern along x axis (‘snpc’ units between 0 and 1).

yoffset
Shift pattern along y axis (‘snpc’ units between 0 and 1).

scale
For star polygons, multiplier (between 0 and 1) applied to exterior radius to get interior radius.

shape
Either "convex" or "star" followed by the number of exterior vertices or alternatively "circle", "square", "null", "rhombille_rhombus", "tetrakis_left", or "tetrakis_right". For example "convex5" corresponds to a pentagon and "star6" corresponds to a six-pointed star. The "square" shape is larger than the "convex4" shape and is rotated an extra 45 degrees, it can be used to generate a multi-colored "checkers" effect when density is 1. The "null" shape is not drawn, it can be used to create holes within multiple-element patterns. The "rhombille_rhombus" shape draws a rhombus while the "tetrakis_left" or "tetrakis_right" shapes draw an isosceles right triangle. These latter three non-regular-polygon shapes are intended to help generate rhombille and tetrakis square tilings.

grid
Adjusts placement and density of certain graphical elements. "square" (default) is a square grid. "hex" is a hexagonal grid suitable for hexagonal and triangular tiling. "hex_circle" is a hexagonal grid suitable for circle packing. "elongated_triangle" is a grid used for the "elongated triangle" tiling.

type
Adjusts the repeating of certain aesthetics such as color. Can use any type in names_hex, names_square, or names_weave. See for pattern_hex(), pattern_square(), and pattern_weave() for more information about supported type arguments.

subtype
See for pattern_hex(), pattern_square(), and pattern_weave() for more information about supported subtype arguments.

rot
Angle to rotate regular polygon (degrees, counter-clockwise).

alpha
Alpha (between 0 and 1) or NA (default, preserves colors’ alpha value).

linetype
Stroke linetype

size
Stroke linewidth
```
default.units  A string indicating the default units to use if x or y are only given as numeric vectors.
name          A character identifier.
gp            An object of class "gpar", typically the output from a call to the function gpar. This is basically a list of graphical parameter settings.
draw          A logical value indicating whether graphics output should be produced.
vp             A Grid viewport object (or NULL).

Value

A grid grob object invisibly. If draw is TRUE then also draws to the graphic device as a side effect.

See Also

grid.pattern_circle() for a special case of this pattern. The tiling vignette features more examples of regular polygon tiling using this function vignette("tiling",package = "gridpattern").

Examples

if (require("grid")) {
  x_hex <- 0.5 + 0.5 * cos(seq(2 * pi / 4, by = 2 * pi / 6, length.out = 6))
  y_hex <- 0.5 + 0.5 * sin(seq(2 * pi / 4, by = 2 * pi / 6, length.out = 6))

  # 'density', 'rot', and 'shape' are vectorized
  grid.newpage()
  grid.pattern_regular_polygon(x_hex, y_hex, colour = "black",
                               fill = c("blue", "yellow", "red"),
                               shape = c("convex4", "star8", "circle"),
                               density = c(0.45, 0.42, 0.4),
                               spacing = 0.08, angle = 0)

  # checker pattern using "square" shape
  grid.newpage()
  grid.pattern_regular_polygon(x_hex, y_hex, shape = "square",
                               colour = "transparent",
                               fill = c("black", "red", "blue", "yellow"),
                               angle = 0, density = 1.0, spacing = 0.2)

  # checker pattern using the default "convex4" shape
  grid.newpage()
  grid.pattern_regular_polygon(x_hex, y_hex, density = 1.0,
                               colour = "black", fill = "blue")

  # using a "twill_zigzag" 'weave' pattern
  grid.newpage()
  grid.pattern_regular_polygon(x_hex, y_hex, fill = c("blue", "yellow"),
                               shape = c("circle", "star8"),
                               density = c(0.5, 0.6), type = "twill_zigzag")

  # hexagon tiling
  grid.newpage()}
grid.pattern_rose

grid.pattern_regular_polygon(x_hex, y_hex, color = "transparent",
fill = c("white", "grey", "black"),
density = 1.0, spacing = 0.1,
shape = "convex6", grid = "hex")

# triangle tiling
grid.newpage()
grid.pattern_regular_polygon(x_hex, y_hex, fill = "green",
density = 1.0, spacing = 0.1,
shape = "convex3", grid = "hex")

grid.pattern_rose  Rose curve patterned grobs

Description

grid.pattern_rose() draws a rose curve pattern onto the graphic device.

Usage

grid.pattern_rose(
  x = c(0, 0, 1, 1),
  y = c(1, 0, 0, 1),
  id = 1L,
  ...
  colour = gp$col %||% "grey20",
  fill = gp$fill %||% "grey80",
  angle = 30,
  density = 0.2,
  spacing = 0.05,
  xoffset = 0,
  yoffset = 0,
  frequency = 0.1,
  grid = "square",
  type = NULL,
  subtype = NULL,
  rot = 0,
  alpha = gp$alpha %||% NA_real_,
  linetype = gp$lty %||% 1,
  size = gp$lwd %||% 1,
  use_R4.1_masks = getOption("ggpattern_use_R4.1_masks",
    getOption("ggpattern_use_R4.1_features")),
  png_device = NULL,
  res = getOption("ggpattern_res", 72),
  default.units = "npc",
  name = NULL,
grid.pattern_rose

```r
gp = gpar(),
draw = TRUE,
vp = NULL
```

Arguments

- **x**: A numeric vector or unit object specifying x-locations of the pattern boundary.
- **y**: A numeric vector or unit object specifying y-locations of the pattern boundary.
- **id**: A numeric vector used to separate locations in x, y into multiple boundaries. All locations within the same id belong to the same boundary.
- **...**: Currently ignored
- **colour**: Stroke colour
- **fill**: Fill colour
- **angle**: Rotation angle in degrees
- **density**: Approx. fraction of area the pattern fills.
- **spacing**: Spacing between repetitions of pattern (’snpc’ units between 0 and 1).
- **xoffset**: Shift pattern along x axis (’snpc’ units between 0 and 1).
- **yoffset**: Shift pattern along y axis (’snpc’ units between 0 and 1).
- **frequency**: The “angular frequency” parameter of the rose pattern.
- **grid**: Adjusts placement and density of certain graphical elements. "square" (default) is a square grid. "hex" is a hexagonal grid suitable for hexagonal and triangular tiling. "hex_circle" is a hexagonal grid suitable for circle packing. "elongated_triangle" is a grid used for the "elongated triangle" tiling.
- **type**: Adjusts the repeating of certain aesthetics such as color. Can use any type in names_hex, names_square, or names_weave. See for pattern_hex(), pattern_square(), and pattern_weave() for more information about supported type arguments.
- **subtype**: See for pattern_hex(), pattern_square(), and pattern_weave() for more information about supported subtype arguments.
- **rot**: Angle to rotate rose (degrees, counter-clockwise).
- **alpha**: Alpha (between 0 and 1) or NA (default, preserves colors’ alpha value).
- **linetype**: Stroke linetype
- **size**: Stroke linewidth
- **use_R4.1_masks**: If TRUE use the grid mask feature introduced in R v4.1.0. If FALSE do a rasterGrob approximation. If NULL try to guess an appropriate choice. Note not all graphic devices support the grid mask feature.
- **png_device**: "png" graphics device to save intermediate raster data with if use_R4.1_masks is FALSE. If NULL and suggested package ragg is available and versions are high enough we directly capture masked raster via ragg::agg_capture(). Otherwise we will use png_device (default ragg::agg_png() if available else grDevices::png()) and png::readPNG() to manually compute a masked raster.
- **res**: Resolution of desired rasterGrob in pixels per inch if use_R4.1_masks is FALSE.
**grid.pattern_stripe**  

Stripe patterned grobs

**Description**

grid.pattern_stripe() draws a stripe pattern onto the graphic device.

**default.units** A string indicating the default units to use if x or y are only given as numeric vectors.

**name** A character identifier.

**gp** An object of class “gpar”, typically the output from a call to the function gpar. This is basically a list of graphical parameter settings.

**draw** A logical value indicating whether graphics output should be produced.

**vp** A Grid viewport object (or NULL).

**Value**

A grid grob object invisibly. If draw is TRUE then also draws to the graphic device as a side effect.

**See Also**

See https://en.wikipedia.org/wiki/Rose_(mathematics) for more information.

**Examples**

```r
if (require("grid") && capabilities("png")) {
  x_hex <- 0.5 + 0.5 * cos(seq(2 * pi / 4, by = 2 * pi / 6, length.out = 6))
  y_hex <- 0.5 + 0.5 * sin(seq(2 * pi / 4, by = 2 * pi / 6, length.out = 6))
  gp <- gpar(fill = c("blue", "red", "yellow", "green"), col = "black")

  grid.newpage()
  grid.pattern_rose(x_hex, y_hex,
                   spacing = 0.15, density = 0.5, angle = 0,
                   frequency = 1:4, gp = gp)
  grid.newpage()
  grid.pattern_rose(x_hex, y_hex,
                   spacing = 0.15, density = 0.5, angle = 0,
                   frequency = 1/1:4, gp = gp)
  grid.newpage()
  grid.pattern_rose(x_hex, y_hex,
                   spacing = 0.18, density = 0.5, angle = 0,
                   frequency = c(3/2, 7/3, 5/4, 3/7), gp = gp)
}
```
grid.pattern_stripe

grid.pattern_stripe(
  x = c(0, 0, 1, 1),
  y = c(1, 0, 0, 1),
  id = 1L,
  ..., 
  colour = gp$col %||% "grey20",
  fill = gp$fill %||% "grey80",
  angle = 30,
  density = 0.2,
  spacing = 0.05,
  xoffset = 0,
  yoffset = 0,
  alpha = gp$alpha %||% NA_real_,
  linetype = gp$lty %||% 1,
  size = gp$lwd %||% 1,
  grid = "square",
  default.units = "npc",
  name = NULL,
  gp = gpar(),
  draw = TRUE,
  vp = NULL
)

Arguments

x  A numeric vector or unit object specifying x-locations of the pattern boundary.
y  A numeric vector or unit object specifying y-locations of the pattern boundary.
id  A numeric vector used to separate locations in x, y into multiple boundaries. All locations within the same id belong to the same boundary.
... Currently ignored
colour  Stroke colour
fill  Fill colour
angle  Rotation angle in degrees
density  Approx. fraction of area the pattern fills.
spacing  Spacing between repetitions of pattern (‘snpc’ units between 0 and 1).
xoffset  Shift pattern along x axis (‘snpc’ units between 0 and 1).
yoffset  Shift pattern along y axis (‘snpc’ units between 0 and 1).
alpha  Alpha (between 0 and 1) or NA (default, preserves colors’ alpha value).
linetype  Stroke linetype
size  Stroke linewidth
grid  Adjusts placement and density of certain graphical elements. "square" (default) is a square grid. "hex" is a hexagonal grid suitable for hexagonal and triangular tiling. "hex_circle" is a hexagonal grid suitable for circle packing. "elongated_triangle" is a grid used for the "elongated triangle" tiling.
grid.pattern_text

A string indicating the default units to use if x or y are only given as numeric vectors.

name
A character identifier.

gp
An object of class "gpar", typically the output from a call to the function gpar. This is basically a list of graphical parameter settings.

draw
A logical value indicating whether graphics output should be produced.

vp
A Grid viewport object (or NULL).

Value
A grid grob object invisibly. If draw is TRUE then also draws to the graphic device as a side effect.

See Also
[grid.pattern_crosshatch()] and [grid.pattern_weave()] for overlaying stripes.

Examples

if (require("grid")) {
  x_hex <- 0.5 + 0.5 * cos(seq(2 * pi / 4, by = 2 * pi / 6, length.out = 6))
  y_hex <- 0.5 + 0.5 * sin(seq(2 * pi / 4, by = 2 * pi / 6, length.out = 6))
  grid.pattern_stripe(x_hex, y_hex, colour = "black",
                      fill = c("red", "blue"), density = 0.4)

  # Can alternatively use "gpar()" to specify colour and line attributes
  grid.newpage()
  grid.pattern_stripe(x_hex, y_hex, density = 0.3,
                      gp = gpar(col = "blue", fill = "yellow"))
}

grid.pattern_text

Text character patterned grobs

Description

grid.pattern_text() draws a text character pattern onto the graphic device.

Usage

grid.pattern_text(
  x = c(0, 0, 1, 1),
  y = c(1, 0, 0, 1),
  id = 1L,
  ...,
  colour = gp$col %/% "grey20",
  angle = 30,
  spacing = 0.05,
  xoffset = 0,
Arguments

**x**
A numeric vector or unit object specifying x-locations of the pattern boundary.

**y**
A numeric vector or unit object specifying y-locations of the pattern boundary.

**id**
A numeric vector used to separate locations in x, y into multiple boundaries. All locations within the same id belong to the same boundary.

**...**
Currently ignored

**colour**
Stroke colour

**angle**
Rotation angle in degrees

**spacing**
Spacing between repetitions of pattern ('snpc' units between 0 and 1).

**xoffset**
Shift pattern along x axis ('snpc' units between 0 and 1).

**yoffset**
Shift pattern along y axis ('snpc' units between 0 and 1).

**scale**
For star polygons, multiplier (between 0 and 1) applied to exterior radius to get interior radius.

**shape**
A character or expression vector. See label argument of `grid::textGrob()` for more details.

**grid**
Adjusts placement and density of certain graphical elements. "square" (default) is a square grid. "hex" is a hexagonal grid suitable for hexagonal and triangular tiling. "hex_circle" is a hexagonal grid suitable for circle packing. "elongated_triangle" is a grid used for the "elongated triangle" tiling.

**type**
Adjusts the repeating of certain aesthetics such as color. Can use any type in names_hex, names_square, or names_weave. See for `pattern_hex()`, `pattern_square()`, and `pattern_weave()` for more information about supported type arguments.
**grid.pattern_text**

subtype  
See for `pattern_hex()`, `pattern_square()`, and `pattern_weave()` for more information about supported subtype arguments.

rot  
Angle to rotate regular polygon (degrees, counter-clockwise).

alpha  
Alpha (between 0 and 1) or NA (default, preserves colors’ alpha value).

size  
Stroke linewidth.

fontfamily  
The font family. See `grid::gpar()` for more details.

fontface  
The font face. See `grid::gpar()` for more details.

use_R4.1_masks  
If TRUE use the grid mask feature introduced in R v4.1.0. If FALSE do a rasterGrob approximation. If NULL try to guess an appropriate choice. Note not all graphic devices support the grid mask feature.

png_device  
“png” graphics device to save intermediate raster data with if use_R4.1_masks is FALSE. If NULL and suggested package ragg is available and versions are high enough we directly capture masked raster via `ragg::agg_capture()`. Otherwise we will use png_device (default `ragg::agg_png()` if available else `grDevices::png()`) and `png::readPNG()` to manually compute a masked raster.

res  
Resolution of desired rasterGrob in pixels per inch if use_R4.1_masks is FALSE.

default.units  
A string indicating the default units to use if x or y are only given as numeric vectors.

name  
A character identifier.

gp  
An object of class "gpar", typically the output from a call to the function `gpar`. This is basically a list of graphical parameter settings.

draw  
A logical value indicating whether graphics output should be produced.

vp  
A Grid viewport object (or NULL).

**Value**

A grid grob object invisibly. If draw is TRUE then also draws to the graphic device as a side effect.

**Examples**

```r
if (require("grid") && capabilities("png")) {
  x_hex <- 0.5 + 0.5 * cos(seq(2 * pi / 4, by = 2 * pi / 6, length.out = 6))
  y_hex <- 0.5 + 0.5 * sin(seq(2 * pi / 4, by = 2 * pi / 6, length.out = 6))

  playing_card_symbols <- c("\u2660", "\u2665", "\u2666", "\u2663")
  grid.newpage()
  grid.pattern_text(x_hex, y_hex,
    shape = playing_card_symbols,
    colour = c("black", "red", "red", "black"),
    size = 18, spacing = 0.1, angle = 0)
}
```
grid.pattern_wave Wave patterned grobs

Description

grid.pattern_wave() draws a wave pattern onto the graphic device.

Usage

grid.pattern_wave(
  x = c(0, 0, 1, 1),
  y = c(1, 0, 0, 1),
  id = 1L,
  ...,
  colour = gp$col %||% "grey20",
  fill = gp$fill %||% "grey80",
  angle = 30,
  density = 0.2,
  spacing = 0.05,
  xoffset = 0,
  yoffset = 0,
  amplitude = 0.5 * spacing,
  frequency = 1/spacing,
  alpha = gp$alpha %||% NA_real_,
  linetype = gp$lty %||% 1,
  size = gp$lwd %||% 1,
  grid = "square",
  type = "triangle",
  default.units = "npc",
  name = NULL,
  gp = gpar(),
  draw = TRUE,
  vp = NULL
)

Arguments

x A numeric vector or unit object specifying x-locations of the pattern boundary.
y A numeric vector or unit object specifying y-locations of the pattern boundary.
 id A numeric vector used to separate locations in x, y into multiple boundaries. All locations within the same id belong to the same boundary.
... Currently ignored
colour Stroke colour
color Fill colour
gle Angle Rotation angle in degrees
grid.pattern_wave

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>density</td>
<td>Approx. fraction of area the pattern fills.</td>
</tr>
<tr>
<td>spacing</td>
<td>Spacing between repetitions of pattern (‘snpc’ units between 0 and 1).</td>
</tr>
<tr>
<td>xoffset</td>
<td>Shift pattern along x axis (‘snpc’ units between 0 and 1).</td>
</tr>
<tr>
<td>yoffset</td>
<td>Shift pattern along y axis (‘snpc’ units between 0 and 1).</td>
</tr>
<tr>
<td>amplitude</td>
<td>Wave amplitude (“snpc” units)</td>
</tr>
<tr>
<td>frequency</td>
<td>Linear frequency (inverse “snpc” units)</td>
</tr>
<tr>
<td>alpha</td>
<td>Alpha (between 0 and 1) or NA (default, preserves colors’ alpha value).</td>
</tr>
<tr>
<td>linetype</td>
<td>Stroke linetype</td>
</tr>
<tr>
<td>size</td>
<td>Stroke linewidth</td>
</tr>
<tr>
<td>grid</td>
<td>Adjusts placement and density of certain graphical elements. &quot;square&quot; (default) is a square grid. &quot;hex&quot; is a hexagonal grid suitable for hexagonal and triangular tiling. &quot;hex_circle&quot; is a hexagonal grid suitable for circle packing. &quot;elongated_triangle&quot; is a grid used for the &quot;elongated triangle&quot; tiling.</td>
</tr>
<tr>
<td>type</td>
<td>Either “sine” or “triangle” (default).</td>
</tr>
<tr>
<td>default.units</td>
<td>A string indicating the default units to use if x or y are only given as numeric vectors.</td>
</tr>
<tr>
<td>name</td>
<td>A character identifier.</td>
</tr>
<tr>
<td>gp</td>
<td>An object of class &quot;gpar&quot;, typically the output from a call to the function gpar. This is basically a list of graphical parameter settings.</td>
</tr>
<tr>
<td>draw</td>
<td>A logical value indicating whether graphics output should be produced.</td>
</tr>
<tr>
<td>vp</td>
<td>A Grid viewport object (or NULL).</td>
</tr>
</tbody>
</table>

Value

A grid grob object invisibly. If draw is TRUE then also draws to the graphic device as a side effect.

See Also

Use grid.pattern_stripe() for straight lines instead of waves.

Examples

```r
if (require("grid")) {
  x_hex <- 0.5 + 0.5 * cos(seq(2 * pi / 4, by = 2 * pi / 6, length.out = 6))
  y_hex <- 0.5 + 0.5 * sin(seq(2 * pi / 4, by = 2 * pi / 6, length.out = 6))
  grid.newpage()
  grid.pattern_wave(x_hex, y_hex, colour = "black", type = "sine",
                   fill = c("red", "blue"), density = 0.4,
                   spacing = 0.15, angle = 0,
                   amplitude = 0.05, frequency = 1 / 0.20)

  # zig-zag pattern is a wave of `type` "triangle"
  grid.newpage()
  grid.pattern_wave(x_hex, y_hex, colour = "black", type = "triangle",
                    fill = c("red", "blue"), density = 0.4,
                    spacing = 0.15, angle = 0, amplitude = 0.075)
}
```
grid.pattern_weave Weave patterned grobs

Description

grid.pattern_weave() draws a weave pattern onto the graphic device.

Usage

grid.pattern_weave(
  x = c(0, 0, 1, 1),
  y = c(1, 0, 0, 1),
  id = 1L,
  ..., 
  colour = gp$col %||% "grey20",
  fill = gp$fill %||% "grey80",
  fill2 = fill,
  angle = 30,
  density = 0.2,
  spacing = 0.05,
  xoffset = 0,
  yoffset = 0,
  alpha = gp$alpha %||% NA_real_,
  linetype = gp$lty %||% 1,
  size = gp$lwd %||% 1,
  grid = "square",
  type = "plain",
  subtype = NA,
  default.units = "npc",
  name = NULL,
  gp = gpar(),
  draw = TRUE,
  vp = NULL
)

Arguments

x A numeric vector or unit object specifying x-locations of the pattern boundary.
y A numeric vector or unit object specifying y-locations of the pattern boundary.
id A numeric vector used to separate locations in x, y into multiple boundaries. All locations within the same id belong to the same boundary.
... Currently ignored
colour Stroke colour
fill The fill colour for the horizontal "weft" lines.
fill2 The fill colour for the vertical "warp" lines.
angle Rotation angle in degrees
density Approx. fraction of area the pattern fills.
spacing Spacing between repetitions of pattern (‘snpc’ units between 0 and 1).
xoffset Shift pattern along x axis (‘snpc’ units between 0 and 1).
yoffset Shift pattern along y axis (‘snpc’ units between 0 and 1).
alpha Alpha (between 0 and 1) or NA (default, preserves colors’ alpha value).
linetype Stroke linetype
size Stroke linewidth
grid Adjusts placement and density of certain graphical elements. "square" (default) is a square grid. "hex" is a hexagonal grid suitable for hexagonal and triangular tiling. "hex_circle" is a hexagonal grid suitable for circle packing. "elongated_triangle" is a grid used for the "elongated triangle" tiling.
type The weave type. See pattern_weave() for more details.
subtype The weave subtype. See pattern_weave() for more details.
default.units A string indicating the default units to use if x or y are only given as numeric vectors.
name A character identifier.
gp An object of class "gpar", typically the output from a call to the function gpar. This is basically a list of graphical parameter settings.
draw A logical value indicating whether graphics output should be produced.
vp A Grid viewport object (or NULL).

Value
A grid grob object invisibly. If draw is TRUE then also draws to the graphic device as a side effect.

See Also
pattern_weave()

Examples
if (require("grid")) {
  x_hex <- 0.5 + 0.5 * cos(seq(2 * pi / 4, by = 2 * pi / 6, length.out = 6))
  y_hex <- 0.5 + 0.5 * sin(seq(2 * pi / 4, by = 2 * pi / 6, length.out = 6))
  gp <- gpar(colour = "black", fill = "lightblue", lwd=0.5)

  # Plain weave (default weave)
  grid.pattern_weave(x_hex, y_hex, fill2 = "yellow",
                     gp = gp, spacing = 0.1, density = 0.3)

  # Irregular matt weave
  grid.newpage()
  grid.pattern_weave(x_hex, y_hex, type = "matt_irregular",
                     fill2 = "yellow", gp = gp, spacing = 0.1, density = 0.3)
}
guess_has_R4.1_features

Guess whether "active" graphics device supports the grid graphics features introduced in R v4.1.

Description

guess_has_R_4.1_features() guesses whether "active" graphics device supports the grid graphics features introduced in R v4.1. If it guesses it does it returns TRUE else FALSE.

Usage

guess_has_R4.1_features(
  features = c("clippingPaths", "gradients", "masks", "patterns")
)

Arguments

features Character vector of features to guess support for. Will return TRUE only if guesses support for all requested features.

"clippingPaths" Supports clipping path feature
"gradients" Supports (both linear and radial) gradient feature
"masks" Supports (alpha) mask feature
"patterns" Supports (tiling) pattern feature

Value

TRUE if we guess all features are supported else FALSE
mean_col

Compute average color

Description

mean_col() computes an average color.

Usage

mean_col(...)

Arguments

... Colors to average

Details

We currently compute an average color by using the quadratic mean of the colors’ RGBA values.

Value

A color string of 9 characters: "#" followed by the red, blue, green, and alpha values in hexadecimal.

Examples

mean_col("black", "white")
mean_col(c("black", "white"))
mean_col("red", "blue")

See Also

Description

`pattern_hex()` returns an integer matrix indicating where each color (or other graphical element) should be drawn on a (horizontal) hex grid for a specified hex pattern type and subtype. `names_hex` lists the currently supported hex types.

Usage

```r
pattern_hex(type = "hex", subtype = NULL, nrow = 5L, ncol = 5L)
```

`names_hex`

Arguments

- `type` Currently just supports "hex".
- `subtype` An integer indicating number of colors (or other graphical elements).
- `nrow` Number of rows (height).
- `ncol` Number of columns (width).

Format

An object of class character of length 5.

Details

"hex" Attempts to use a uniform coloring if it exists. For subtype 1L, 2L, and 3L we use the "hex1" pattern. For subtype 4L we use the "hex2" pattern. For subtype 7L we use the "hex3" pattern. Else a uniform coloring does not exist and we use the "hex_skew" pattern.

"hex1" Provides the 1-uniform colorings of a hexagonal tiling. Only exists for subtype 1L, 2L, or 3L.

"hex2" Provides the 2-uniform colorings of a hexagonal tiling. Only exists for subtype 2L or 4L.

"hex3" Provides the 3-uniform colorings of a hexagonal tiling. Only exists for subtype 2L or 7L.

"hex_skew" For the "hex_skew" type we cycle through subtype elements on the horizontal line and "main" diagonal line. For some subtype numbers this may lead to noticeable color repeats on the "skew" diagonal line. If subtype is strictly greater than 2L then a hexagon should never touch another hexagon of the same color.
pattern_square

Value
A matrix of integer values indicating where the each color or other graphical elements should be drawn on a horizontal hex grid (i.e. hexagons are assumed to be pointy side up). Indices [1,1] of the matrix corresponds to the bottom-left of the grid while indices [1,ncol] corresponds to the bottom-right of the grid. The even rows are assumed to be on the left of the ones on the odd rows (for those in the same column in the matrix). This matrix has a "pattern_hex" subclass which supports a special print() method.

See Also
grid_pattern_regular_polygon() for drawing to a graphics device hexagons, triangles, circles, etc. in hexagon patterns. The tiling vignette features several examples of regular polygon tiling using this both the "hex" and "hex_circle" types vignette("tiling",package = "gridpattern"). For more information on uniform colorings of a hexagonal tiling see https://en.wikipedia.org/wiki/Hexagonal_tiling#Uniform_colorings.

Examples

# supported hex names
print(names_hex)

# 1-uniform 3-color
hex_3color <- pattern_hex("hex1", 3L, nrow = 7L, ncol = 9L)
print(hex_3color)

# 2-uniform 4-color
hex_4color <- pattern_hex("hex2", 4L, nrow = 7L, ncol = 9L)
print(hex_4color)

pattern_square

Square pattern matrix

Description

pattern_square() returns an integer matrix indicating where each color (or other graphical element) should be drawn on a rectangular grid for a specified square pattern type and subtype. names_square lists the currently supported square types (excluding those in names_weave).

Usage

pattern_square(type = "diagonal", subtype = NULL, nrow = 5L, ncol = 5L)

names_square
Arguments

- **type**
  - Either "diagonal" (default), "diagonal_skew", "horizontal", "vertical", or any type in names_weave. See Details.

- **subtype**
  - See Details. For "diagonal", "diagonal_skew", "horizontal", or "vertical" an integer of the desired number of colors (or other graphical elements).

- **nrow**
  - Number of rows (height).

- **ncol**
  - Number of columns (width).

Format

An object of class character of length 6.

Details

- "horizontal", "vertical"  "horizontal" and "vertical" simply cycle through the colors either horizontally or vertically. Use subtype to indicate the (integer) number of colors (or other graphical elements). "horizontal" will produce horizontal stripes of color whereas "vertical" will produce vertical stripes.

- "diagonal", "diagonal_skew"  "diagonal" and "diagonal_skew" simply cycle through the colors both horizontally and vertically. Use subtype to indicate the (integer) number of colors (or other graphical elements). If two colors are requested this provides the standard two-color checkerboard pattern. If there are more than three colors than "diagonal" will have colored diagonals going from top left to bottom right while "diagonal_skew" will have them going from bottom left to top right.

- "square"  "square" attempts a uniform coloring using "square_tiling" before falling falling back on "diagonal". If subtype is 1L, 2L, 3L, or 4L uses "square_tiling" else uses "diagonal".

- "square_tiling"  "square_tiling" supports uniform coloring for (non-staggered) square tilings. Use subtype to either indicate the (integer) number of colors or a string with four integers such as "1231" (will fill in a 2x2 matrix by row which will then be tiled). Supports up to a max of four colors.

Any pattern from names_weave We simply convert the logical matrix returned by pattern_weave() into an integer matrix by having any TRUE set to 1L and FALSE set to 2L. Hence the various weave patterns only support (up to) two-color patterns. See pattern_weave() for more details about supported type and subtype.

Value

A matrix of integer values indicating where the each color (or other graphical element) should be drawn on a rectangular grid. Indices [1,1] of the matrix corresponds to the bottom-left of the grid while indices [1,ncol] corresponds to the bottom-right of the grid. This matrix has a "pattern_square" subclass which supports a special print() method.

See Also

grid.pattern_regular_polygon() for drawing to a graphics device polygons in multiple color/size/shape patterns. pattern_weave() for more information on "weave" patterns.
Examples

```r
# supported square names
print(names_square)

# (main) diagonal has colors going from top left to bottom right
diagonal <- pattern_square("diagonal", 4L, nrow = 7L, ncol = 9L)
print(diagonal)

# skew diagonal has colors going from bottom left to top right
skew <- pattern_square("diagonal_skew", 4L, nrow = 7L, ncol = 9L)
print(skew)

horizontal <- pattern_square("horizontal", 4L, nrow = 8L, ncol = 8L)
print(horizontal)

vertical <- pattern_square("vertical", 4L, nrow = 8L, ncol = 8L)
print(vertical)

# uniform coloring using 4 colors
color4 <- pattern_square("square_tiling", 4L, nrow = 7L, ncol = 9L)
print(color4)

# uniform coloring using 3 colors
color3 <- pattern_square("square_tiling", 3L, nrow = 7L, ncol = 9L)
print(color3)

# also supports the various 'weave' patterns
zigzag <- pattern_square("twill_zigzag", nrow = 15L, ncol = 9L)
print(zigzag)
```

### pattern_weave

**Weave pattern matrix**

**Description**

`pattern_weave()` returns a logical matrix indicating where the warp lines should be "up" for a specified weave pattern type and subtype. `names_weave` is a character vector listing supported weave pattern types.

**Usage**

```r
pattern_weave(type = "plain", subtype = NULL, nrow = 5L, ncol = 5L)

names_weave
```
Arguments

- **type**
  Type of weave. See Details.
- **subtype**
  Subtype of weave. See Details.
- **nrow**
  Number of rows (length of warp).
- **ncol**
  Number of columns (length of weft).

Format

An object of class character of length 10.

Details

Here is a list of the various weave types supported:

- **basket**
  A simple criss-cross pattern using two threads at a time. Same as the "matt_irregular" weave but with a default subtype of 2L.

- **matt**
  A simple criss-cross pattern using 3 (or more) threads at a time. Same as the "matt_irregular" weave but with a default subtype of 3L.

- **matt_irregular**
  A generalization of the "plain" weave. A character subtype "U/D(L+R)" is a standard matt weave specification: U indicates number warp up, D indicates number warp down, L indicates number of warp up in repeat, and R indicates number of warp down in repeat. An integer subtype N will be interpreted as a "N/N(N+M)" irregular matt weave. A character subtype "U/D" will be interpreted as a "U/D(U+D)" irregular matt weave. Has a default subtype of "3/2(4+2)".

- **plain**
  A simple criss-cross pattern. Same as the "matt_irregular" weave but with a default subtype of 1L.

- **rib_warp**
  A plain weave variation that emphasizes vertical lines. An integer subtype N will be interpreted as a "matt_irregular" "N/N(1+1)" weave. A character subtype "U/D" will be interpreted as a "matt_irregular" "U/D(1+1)" weave. Default subtype of 2L.

- **satin**
  A "regular" satin weave is a special type of the elongated twill weave with a move number carefully chosen so no twill line is distinguishable. Same as the "twill_elongated" weave but with a default subtype of 5L.

- **twill**
  A simple diagonal pattern. Same as the "twill_elongated" weave but with a default subtype of "2/1".

- **twill_elongated**
  A generalization of the "twill" weave. A character subtype "U/D(M)" is a standard twill weave specification: U indicates number warp up, D indicates number warp down, and M indicates the "move" number. A character subtype "U/D" will be interpreted as a "U/D(1)" elongated twill weave. An integer subtype N will provide a "(N-1)/1(1)" elongated twill weave if N is less than 5, 6, or greater than 14 otherwise it will provide a "(N-1)/1(M)" weave where M is the largest possible regular "satin" move number. Default subtype of "4/3(2)".

- **twill_herringbone**
  Adds a (vertical) "herringbone" effect to the specified "twill_elongated" weave. Default subtype of "4/3(2)".

- **twill_zigzag**
  Adds a (vertical) "zig-zag" effect to the specified "twill_elongated" weave. Default subtype of "4/3(2)".
For both "matt" and "twill" weaves the U/D part of the subtype can be further extended to U1/D1+U2/D2, U1/D1+U2/D2+U3/D3, etc. For the "matt" weave the "(L+R)" part of the subtype can be further extended to (L1+R1+L2+R2), (L1+R1+L2+R2+L3+R3), etc.

**Value**

A matrix of logical values indicating where the "warp" is "up" (if TRUE) or "down" (if FALSE). Indices [1,1] of the matrix corresponds to the bottom-left of the weave while indices [1,ncol] corresponds to the bottom-right of the weave. This matrix has a "pattern_weave" subclass which supports a special print() method.

**See Also**


**Examples**

```r
def print(names_weave)
plain <- pattern_weave("plain", nrow = 7, ncol = 9)
print(plain)

matt_irregular <- pattern_weave("matt_irregular", nrow = 9, ncol = 11)
print(matt_irregular)

satin <- pattern_weave("satin", nrow = 9, ncol = 11)
print(satin)

twill <- pattern_weave("twill", nrow = 9, ncol = 11)
print(twill)

twill_zigzag <- pattern_weave("twill_zigzag", nrow = 18, ncol = 11)
print(twill_zigzag)
```

---

**star_scale**

*Compute regular star polygon scale or angles*

**Description**

star_scale() computes star scale value given an internal or external angle. star_angle() computes star angle (internal or external) given a scale value.
Usage

star_scale(n_vertices, angle, external = FALSE)

star_angle(n_vertices, scale, external = FALSE)

Arguments

n_vertices Number of exterior vertices.
angle Angle in degrees.
external If TRUE angle should be considered an external angle.
scale Scale from 0 to 1.

details

grid.pattern_regular_polygon() parameterizes regular star polygons with the number of its external vertices and a scale that equals the fraction of the radius of the circle that circumscribes the interior vertices divided by the radius of the circle that circumscribes the exterior vertices. These helper functions help convert between that parameterization and either the internal or external angle of the regular star polygon.

Value

star_scale() returns a numeric value between 0 and 1 intended for use as the scale argument in grid.pattern_regular_polygon(). star_angle() returns a numeric value between 0 and 360 (degrees).

Examples

# 8/3 star has internal angle 45 degrees and external angle 90 degrees
scale <- star_scale(8, 45)
scale2 <- star_scale(8, 90, external = TRUE)
all.equal(scale, scale2)
star_angle(8, scale)
star_angle(8, scale, external = TRUE)

if (require("grid")) {
  grid.pattern_regular_polygon(shape = "star8", scale = scale, angle = 0,
                              spacing = 0.2, density = 0.8)
}
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