

# Package ‘colourvalues’

January 17, 2019

**Type** Package

**Title** Assigns Colours to Values

**Version** 0.2.2

**Date** 2019-01-17

**Description** Maps one of the viridis colour palettes, or a user-specified palette to values. Viridis colour maps are created by Stéfan van der Walt and Nathaniel Smith. They were set as the default palette for the 'Python' 'Matplotlib' library, introduced at SciPy 2015 conference <<http://scipy2015.scipy.org/ehome/index.php?eventid=115969&>>. Other palettes available in this library have been derived from 'RColorBrewer' <<https://CRAN.R-project.org/package=RColorBrewer>> and 'colorspace' <<https://CRAN.R-project.org/package=colorspace>> packages.

**License** GPL-3

**Encoding** UTF-8

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**LinkingTo** Rcpp, BH

**Imports** graphics, Rcpp

**RoxygenNote** 6.1.1

**Suggests** covr, microbenchmark, ggplot2, scales, testthat, viridisLite

**NeedsCompilation** yes

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## R topics documented:

blue2green . . . . .	3
blue2red . . . . .	3
blue2yellow . . . . .	3

blues	4
brbg	4
bugn	4
bupu	4
cividis	5
cm	5
colour_palettes	5
colour_values	6
colour_values_rgb	9
convert_colour	11
cyan2yellow	11
diverge_hcl	12
diverge_hsv	12
gnbu	12
green2red	12
greens	13
greys	13
heat	13
heat_hcl	13
inferno	14
magenta2green	14
magma	14
matlab_like	14
matlab_like2	15
oranges	15
orrd	15
piyg	15
plasma	16
prgn	16
pubu	16
pubugn	16
puor	17
purd	17
purples	17
rainbow	17
rainbow_hcl	18
rdbu	18
rdgy	18
rdpu	18
rdylbu	19
rdylgn	19
reds	19
sequential_hcl	19
show_colours	20
spectral	20
terrain	20
terrain_hcl	21
topo	21

*blue2green* 3

viridis . . . . .	21
ygobb . . . . .	21
ylgn . . . . .	22
ylgnbu . . . . .	22
ylorbr . . . . .	22
ylorrd . . . . .	22

**Index** 23

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*blue2green*      *Blue2green*

---

**Description**

Data Frame of the blue2green palette

**Usage**

blue2green()

---

*blue2red*      *Blue2red*

---

**Description**

Data Frame of the blue2red palette

**Usage**

blue2red()

---

*blue2yellow*      *Blue2yellow*

---

**Description**

Data Frame of the blue2yellow palette

**Usage**

blue2yellow()

blues *Blues*

---

**Description**

Data Frame of the blues palette

**Usage**

blues()

---

brbg *Brbg*

---

**Description**

Data Frame of the brbg palette

**Usage**

brbg()

---

bugn *Bugn*

---

**Description**

Data Frame of the bugn palette

**Usage**

bugn()

---

bupu *Bupu*

---

**Description**

Data Frame of the bupu palette

**Usage**

bupu()

---

cividis	<i>Cividis</i>
---------	----------------

---

**Description**

Data frame of the cividis palette

**Usage**

```
cividis()
```

---

cm	<i>Cm</i>
----	-----------

---

**Description**

Data Frame of the cm palette

**Usage**

```
cm()
```

---

colour_palettes	<i>Colour Palettes</i>
-----------------	------------------------

---

**Description**

List the available colour palettes.

**Usage**

```
colour_palettes(colours = NULL)
```

```
color_palettes(colours = NULL)
```

**Arguments**

colours	vector of source colour palettes to return, one or many of "viridis", "rcolorbrewer", "grdevices", "colorspace" NULL will retrn all palettes.
---------	--

**Details**

The palettes available in colourvalues have been derived from those available in the libraries

- viridis
- RColorBrewer
- grDevices
- colorspace
- colorRamp

**Examples**

```
colour_palettes()
colour_palettes( "viridis" )
colour_palettes( colours = c("rcolorbrewer","grdevices") )
```

---

colour_values	<i>Colour Values</i>
---------------	----------------------

---

**Description**

maps colours to values

**Usage**

```
colour_values(x, palette = "viridis", na_colour = "#808080FF",
  alpha = 255, include_alpha = TRUE, ...)
```

```
color_values(x, palette = "viridis", na_colour = "#808080FF",
  alpha = 255, include_alpha = TRUE, ...)
```

```
## S3 method for class 'character'
colour_values_to_hex(x, palette, na_colour, alpha,
  include_alpha, summary = FALSE)
```

```
## Default S3 method:
colour_values_to_hex(x, palette, na_colour, alpha,
  include_alpha, n_summaries = 0, format = TRUE, digits = 2)
```

```
## S3 method for class 'logical'
colour_values_to_hex(x, palette, na_colour, alpha,
  include_alpha, summary = FALSE)
```

```
## S3 method for class 'factor'
colour_values_to_hex(x, palette, na_colour, alpha,
  include_alpha, summary = FALSE)
```

```
## S3 method for class 'Date'
colour_values_to_hex(x, palette, na_colour, alpha,
  include_alpha, n_summaries = 0, format = TRUE)

## S3 method for class 'POSIXct'
colour_values_to_hex(x, palette, na_colour, alpha,
  include_alpha, n_summaries = 0, format = TRUE)

## S3 method for class 'POSIXlt'
colour_values_to_hex(x, palette, na_colour, alpha,
  include_alpha, n_summaries = 0, format = TRUE)
```

## Arguments

x	vector of values to map to a colour
palette	colour palette. See details and examples
na_colour	hex string colour to use for NA values in the form #RRGGBBAA.
alpha	optional. Single value in [0,255] applied to all colours, or a decimal in [0, 1) (to indicate a percentage, noting 1 is excluded), or a vector of numeric values the same length as x. The numeric vector will be scaled into the range [0,255]. If a matrix palette is supplied this argument is ignored.
include_alpha	logical indicating if the returned hex or matrix should include the alpha values. Defaults to TRUE.
...	other arguments passed to methods
summary	logical indicating if a summary of the colours should be returned as well as the full colour mapping. This will be the unique elements of x mapped to the colour.
n_summaries	positive integer. If supplied a summary colour palette will be returned in a list, containing n_summaries equally spaced values of x in the range [min(x), max(x)], and their associated colours. If a non-numeric x is used this value is ignored
format	logical indicating if the summary values should be formatted. See details
digits	Integer. When summarising a numeric vector you can specify the number of decimal places to include in the summary values

## Details

The palette can either be

- String - use `colour_palettes()` to view available palettes
- Matrix - At least 5 rows, and 3 (or 4) columns representing the red, green and blue (and alpha) values

The matrix palette requires 5 rows because the colours are interpolated using a cubic b-spline. This method requires 5 values.

when `summary = TRUE`, the following rules are applied to the summary values

- logical vectors are converted to "TRUE" or "FALSE" strings

- all other types remain as-is, unless `format = T` is used

when `format = TRUE`,

- numbers are converted to strings with the specified number of decimal places (using `digits` argument)
- Dates are formatted as "yyyy-mm-dd"

### See Also

`colour_values_rgb`

### Examples

```
## in-built palettes
colour_values(x = 1:5) ## default is "viridis"
colour_values(x = 1:5, palette = "inferno")
colour_values(x = 1:5, palette = "plasma")
colour_values(x = 1:5, palette = "magma")
colour_values(x = 1:5, palette = "cividis")
colour_values(x = 1:5, palette = "rainbow")

## matrix palette
n <- 100
m <- grDevices::colorRamp(c("red", "green"))( (1:n)/n )
df <- data.frame(a = 10, x = 1:n)
df$col <- colour_values(df$x, palette = m)
barplot(height = df$a, col = df$col, border = NA, space = 0)

## with an alpha column on the palette
n <- 100
m <- grDevices::colorRamp(c("red", "green"))( (1:n)/n )
m <- cbind(m, seq(0, 255, length.out = 100))
df <- data.frame(a = 10, x = 1:n)
df$col <- colour_values(df$x, palette = m)
barplot(height = df$a, col = df$col, border = NA, space = 0)

## single alpha value for all colours
df <- data.frame(a = 10, x = 1:255)
df$col <- colour_values(df$x, alpha = 50)
barplot(height = df$a, col = df$col, border = NA, space = 0)

## vector of alpha values
df <- data.frame(a = 10, x = 1:300, y = rep(c(1:50, 50:1), 3) )
df$col <- colour_values(df$x, alpha = df$y)
barplot(height = df$a, col = df$col, border = NA, space = 0)

## returning a summary palette
colour_values(-10:10, n_summaries = 5)
```



---

colour_values_rgb	<i>Colour Values RGB</i>
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---

### Description

Maps colours to variables, returning a matrix of RGB(A) values

### Usage

```
colour_values_rgb(x, palette = "viridis", na_colour = "#808080FF",  
  alpha = 255, include_alpha = TRUE, ...)
```

```
color_values_rgb(x, palette = "viridis", na_colour = "#808080FF",  
  alpha = 255, include_alpha = TRUE, ...)
```

```
## S3 method for class 'character'  
colour_values_to_rgb(x, palette, na_colour, alpha,  
  include_alpha, summary = FALSE)
```

```
## Default S3 method:  
colour_values_to_rgb(x, palette, na_colour, alpha,  
  include_alpha, n_summaries = 0, format = TRUE, digits = 2)
```

```
## S3 method for class 'logical'  
colour_values_to_rgb(x, palette, na_colour, alpha,  
  include_alpha, summary = FALSE)
```

```
## S3 method for class 'factor'  
colour_values_to_rgb(x, palette, na_colour, alpha,  
  include_alpha, summary = FALSE)
```

```
## S3 method for class 'Date'  
colour_values_to_rgb(x, palette, na_colour, alpha,  
  include_alpha, n_summaries = 0, format = TRUE)
```

```
## S3 method for class 'POSIXct'  
colour_values_to_rgb(x, palette, na_colour, alpha,  
  include_alpha, n_summaries = 0, format = TRUE)
```

```
## S3 method for class 'POSIXlt'  
colour_values_to_rgb(x, palette, na_colour, alpha,  
  include_alpha, n_summaries = 0, format = TRUE)
```

### Arguments

x	vector of values to map to a colour
palette	colour palette. See details and examples

na_colour	hex string colour to use for NA values in the form #RRGGBBAA.
alpha	optional. Single value in [0,255] applied to all colours, or a decimal in [0, 1) (to indicate a percentage, noting 1 is excluded), or a vector of numeric values the same length as x. The numeric vector will be scaled into the range [0,255]. If a matrix palette is supplied this argument is ignored.
include_alpha	logical indicating if the returned hex or matrix should include the alpha values. Defaults to TRUE.
...	other arguments passed to methods
summary	logical indicating if a summary of the colours should be returned as well as the full colour mapping. This will be the unique elements of x mapped to the colour.
n_summaries	positive integer. If supplied a summary colour palette will be returned in a list, containing n_summaries equally spaced values of x in the range [min(x), max(x)], and their associated colours. If a non-numeric x is used this value is ignored
format	logical indicating if the summary values should be formatted. See details
digits	Integer. When summarising a numeric vector you can specify the number of decimal places to include in the summary values

### Details

The palette can either be

- String - use `colour_palettes()` to view available palettes
- Matrix - At least 5 rows, and 3 (or 4) columns representing the red, green and blue (and alpha) values

The matrix palette requires 5 rows because the colours are interpolated using a cubic b-spline. This method requires 5 values.

when `summary = TRUE`, the following rules are applied to the summary values

- logical vectors are converted to "TRUE" or "FALSE" strings
- all other types remain as-is, unless `format = T` is used

when `format = TRUE`,

- numbers are converted to strings with the specified number of decimal places (using `digits` argument)
- Dates are formatted as "yyyy-mm-dd"

### See Also

`colour_values`

### Examples

```
colour_values_rgb(1:5)
colour_values_rgb(1:5, include_alpha = FALSE)
colour_values_rgb(-25:25, n_summaries = 5)
```

---

convert_colour	<i>Convert Colour</i>
----------------	-----------------------

---

**Description**

Converts colours between RRGGBBAA and hex strings, in both directions.

**Usage**

```
convert_colour(x)
```

```
convert_colours(x)
```

```
convert_color(x)
```

```
convert_colors(x)
```

**Arguments**

x character vector of hex strings, or numeric matrix of RRGGBBAA values

**Details**

If a combination of hex strings with and without alpha values are supplied, those without are assumed to have an alpha value of FF and will be returned in the RRGGBBAA matrix

**Examples**

```
convert_colour(c("#FFAA00"))
convert_colour(c("#FFAA00", "#FF00A0FF"))

convert_colour(matrix(c(255,170,0),ncol = 3))
convert_colour(matrix(c(255,170,0,255),ncol = 4))
```

---

cyan2yellow	<i>Cyan2yellow</i>
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---

**Description**

Data Frame of the cyan2yellow palette

**Usage**

```
cyan2yellow()
```

---

diverge_hcl	<i>Diverge_hcl</i>
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---

**Description**

Data Frame of the diverge\_hcl palette

**Usage**

diverge\_hcl()

---

diverge_hsv	<i>Diverge_hsv</i>
-------------	--------------------

---

**Description**

Data Frame of the diverge\_hsv palette

**Usage**

diverge\_hsv()

---

gnbu	<i>Gnbu</i>
------	-------------

---

**Description**

Data Frame of the gnbu palette

**Usage**

gnbu()

---

green2red	<i>Green2red</i>
-----------	------------------

---

**Description**

Data Frame of the green2red palette

**Usage**

green2red()

---

greens	<i>Greens</i>
--------	---------------

---

**Description**

Data Frame of the greens palette

**Usage**

greens()

---

greys	<i>Greys</i>
-------	--------------

---

**Description**

Data Frame of the greys palette

**Usage**

greys()

---

heat	<i>Heat</i>
------	-------------

---

**Description**

Data Frame of the heat palette

**Usage**

heat()

---

heat_hcl	<i>Heat_hcl</i>
----------	-----------------

---

**Description**

Data Frame of the heat\_hcl palette

**Usage**

heat\_hcl()

---

inferno	<i>Inferno</i>
---------	----------------

---

**Description**

Data frame of the inferno palette

**Usage**

inferno()

---

magenta2green	<i>Magenta2green</i>
---------------	----------------------

---

**Description**

Data Frame of the magenta2green palette

**Usage**

magenta2green()

---

magma	<i>Magma</i>
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---

**Description**

Data frame of the magma palette

**Usage**

magma()

---

matlab_like	<i>Matlab_like</i>
-------------	--------------------

---

**Description**

Data Frame of the matlab\_like palette

**Usage**

matlab\_like()

---

matlab_like2	<i>Matlab_like2</i>
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---

**Description**

Data Frame of the matlab\_like2 palette

**Usage**

matlab\_like2()

---

oranges	<i>Oranges</i>
---------	----------------

---

**Description**

Data Frame of the oranges palette

**Usage**

oranges()

---

orrd	<i>Orrd</i>
------	-------------

---

**Description**

Data Frame of the orrd palette

**Usage**

orrd()

---

piyg	<i>Piyg</i>
------	-------------

---

**Description**

Data Frame of the piyg palette

**Usage**

piyg()

---

plasma	<i>Plasma</i>
--------	---------------

---

**Description**

Data frame of the plasma palette

**Usage**

plasma()

---

prgn	<i>Prgn</i>
------	-------------

---

**Description**

Data Frame of the prgn palette

**Usage**

prgn()

---

pubu	<i>Pubu</i>
------	-------------

---

**Description**

Data Frame of the pubu palette

**Usage**

pubu()

---

pubugn	<i>Pubugn</i>
--------	---------------

---

**Description**

Data Frame of the pubugn palette

**Usage**

pubugn()



---

puor	<i>Puor</i>
------	-------------

---

**Description**

Data Frame of the puor palette

**Usage**

puor()

---

purd	<i>Purd</i>
------	-------------

---

**Description**

Data Frame of the purd palette

**Usage**

purd()

---

purples	<i>Purples</i>
---------	----------------

---

**Description**

Data Frame of the purples palette

**Usage**

purples()

---

rainbow	<i>Rainbow</i>
---------	----------------

---

**Description**

Data Frame of the rainbow palette

**Usage**

rainbow()

---

rainbow_hcl	<i>Rainbow_hcl</i>
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---

**Description**

Data Frame of the rainbow\_hcl palette

**Usage**

rainbow\_hcl()

---

rdbu	<i>Rdbu</i>
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---

**Description**

Data Frame of the rdbu palette

**Usage**

rdbu()

---

rdgy	<i>Rdgy</i>
------	-------------

---

**Description**

Data Frame of the rdgy palette

**Usage**

rdgy()

---

rdpu	<i>Rdpu</i>
------	-------------

---

**Description**

Data Frame of the rdpu palette

**Usage**

rdpu()

---

rdylbu	<i>Rdylbu</i>
--------	---------------

---

**Description**

Data Frame of the rdylbu palette

**Usage**

rdylbu()

---

rdylgn	<i>Rdylgn</i>
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---

**Description**

Data Frame of the rdylgn palette

**Usage**

rdylgn()

---

reds	<i>Reds</i>
------	-------------

---

**Description**

Data Frame of the reds palette

**Usage**

reds()

---

sequential_hcl	<i>Sequential_hcl</i>
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---

**Description**

Data Frame of the sequential\_hcl palette

**Usage**

sequential\_hcl()

---

show_colours	<i>Show Colours</i>
--------------	---------------------

---

**Description**

Plots all the selected colours. See [colour\\_palettes](#) for available colours.

**Usage**

```
show_colours(colours = colour_palettes())
```

**Arguments**

colours            vector of colour palettes

**Examples**

```
## view all the colour palettes
show_colours()

## view a selection of colour palettes
show_colours( colours = colour_palettes( c("viridis", "grdevices") ) )
```

---

spectral	<i>Spectral</i>
----------	-----------------

---

**Description**

Data Frame of the spectral palette

**Usage**

```
spectral()
```

---

terrain	<i>Terrain</i>
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---

**Description**

Data frame of the terrain palette

**Usage**

```
terrain()
```

---

terrain_hcl	<i>Terrain_hcl</i>
-------------	--------------------

---

**Description**

Data Frame of the terrain\_hcl palette

**Usage**

```
terrain_hcl()
```

---

topo	<i>Topo</i>
------	-------------

---

**Description**

Data Frame of the topo palette

**Usage**

```
topo()
```

---

viridis	<i>Viridis</i>
---------	----------------

---

**Description**

Data frame of the viridis palette

**Usage**

```
viridis()
```

---

ygobb	<i>Ygobb</i>
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---

**Description**

Data Frame of the ygobb palette

**Usage**

```
ygobb()
```

---

ylgn	<i>Ylgn</i>
------	-------------

---

**Description**

Data Frame of the ylgn palette

**Usage**

ylgn()

---

ylgnbu	<i>Ylgnbu</i>
--------	---------------

---

**Description**

Data Frame of the ylgnbu palette

**Usage**

ylgnbu()

---

ylorbr	<i>Ylorbr</i>
--------	---------------

---

**Description**

Data Frame of the ylorbr palette

**Usage**

ylorbr()

---

ylorrd	<i>Ylorrd</i>
--------	---------------

---

**Description**

Data Frame of the ylorrd palette

**Usage**

ylorrd()

# Index

blue2green, 3  
blue2red, 3  
blue2yellow, 3  
blues, 4  
brbg, 4  
bugn, 4  
bupu, 4  
  
cividis, 5  
cm, 5  
color\_palettes (colour\_palettes), 5  
color\_values (colour\_values), 6  
color\_values\_rgb (colour\_values\_rgb), 9  
colour\_palettes, 5, 20  
colour\_values, 6  
colour\_values\_rgb, 9  
colour\_values\_to\_hex.character  
    (colour\_values), 6  
colour\_values\_to\_hex.Date  
    (colour\_values), 6  
colour\_values\_to\_hex.default  
    (colour\_values), 6  
colour\_values\_to\_hex.factor  
    (colour\_values), 6  
colour\_values\_to\_hex.logical  
    (colour\_values), 6  
colour\_values\_to\_hex.POSIXct  
    (colour\_values), 6  
colour\_values\_to\_hex.POSIXlt  
    (colour\_values), 6  
colour\_values\_to\_rgb.character  
    (colour\_values\_rgb), 9  
colour\_values\_to\_rgb.Date  
    (colour\_values\_rgb), 9  
colour\_values\_to\_rgb.default  
    (colour\_values\_rgb), 9  
colour\_values\_to\_rgb.factor  
    (colour\_values\_rgb), 9  
colour\_values\_to\_rgb.logical  
    (colour\_values\_rgb), 9  
colour\_values\_to\_rgb.POSIXct  
    (colour\_values\_rgb), 9  
colour\_values\_to\_rgb.POSIXlt  
    (colour\_values\_rgb), 9  
convert\_color (convert\_colour), 11  
convert\_colors (convert\_colour), 11  
convert\_colour, 11  
convert\_colours (convert\_colour), 11  
cyan2yellow, 11  
  
diverge\_hcl, 12  
diverge\_hsv, 12  
  
gnbu, 12  
green2red, 12  
greens, 13  
greys, 13  
  
heat, 13  
heat\_hcl, 13  
  
inferno, 14  
  
magenta2green, 14  
magma, 14  
matlab\_like, 14  
matlab\_like2, 15  
  
oranges, 15  
orrd, 15  
  
piyg, 15  
plasma, 16  
prgn, 16  
pubu, 16  
pubugn, 16  
puor, 17  
purd, 17  
purples, 17  
  
rainbow, 17

rainbow\_hcl, 18  
rdbu, 18  
rdgy, 18  
rdpu, 18  
rdylbu, 19  
rdylgn, 19  
reds, 19

sequential\_hcl, 19  
show\_colours, 20  
spectral, 20

terrain, 20  
terrain\_hcl, 21  
topo, 21

viridis, 21

ygobb, 21  
ylgn, 22  
ylgnbu, 22  
ylorbr, 22  
ylorrd, 22