Package ‘munsell’

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Description Provides easy access to, and manipulation of, the Munsell colours. Provides a mapping between Munsell’s original notation (e.g. ‘5R 5/10”) and hexadecimal strings suitable for use directly in R graphics. Also provides utilities to explore slices through the Munsell colour tree, to transform Munsell colours and display colour palettes.

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chroma_slice

Plot all colours with the same chroma

Description

Plots slices of the Munsell colour system where chroma is constant.

Usage

```r
chroma_slice(chroma.name = seq(0, 26, by = 2), back.col = "white")
```

Arguments

- `chroma.name`: integer vector of the desired values.
- `back.col`: colour for the background

Value

ggplot object

Examples

```r
chroma_slice(2)
chroma_slice(18)
# Maybe want to delete text and add axis instead
p <- chroma_slice(18)
p$layers[[2]] <- NULL # remove text layer
p + ggplot2::theme(axis.text = ggplot2::element_text(),
   axis.text.x = ggplot2::element_text(angle = 90, hjust = 1))
# all values
## Not run: chroma_slice(seq(0, 38, by = 2))
```
complement

Find the complement of a munsell colour

Description

Finds the munsell colour with the same chroma and value but on the opposite side of the hue circle. The complement is not defined for greys (hue == "N"), and the function returns the grey untransformed.

Usage

complement(col, ...)

Arguments

col character vector of Munsell colours

... passed on to in_gamut. Use fix = TRUE to fix "bad" complement

Value

character vector of Munsell colours

Examples

complement("SPB 2/4")
cols <- c("5PB 2/4", "SY 7/8")
plot_mnsl(c(cols, complement(cols)))

complement_slice

A vertical slice through the Munsell space

Description

Plot a hue and its complement at all values and chromas

Usage

complement_slice(hue.name, back.col = "white")

Arguments

hue.name character string of the desired hue.

back.col colour for the background
Value

ggplot object

Examples

complement_slice("5PB")
complement_slice("5R")
complement_slice("10G")

darker  Make a munsell colour darker

Description

Decreases the value of the Munsell colour by 1.

Usage

darker(col, steps = 1)

Arguments

col character vector of Munsell colours
steps number of steps to take in decreasing value

Value

character vector of Munsell colours

Examples

darker("5PB 3/4")
cols <- c("5PB 3/4", "5Y 7/8")
p <- plot_mnsl(c(cols, darker(cols), darker(cols, 2)))
p + ggplot2::facet_wrap(~ names, ncol = 2)
**desaturate**  
*Make a munsell colour less saturated*

**Description**
Decreases the chroma of the Munsell colour by one step steps (multiples of 2).

**Usage**
desaturate(col, steps = 1)

**Arguments**
- col: character vector of Munsell colours
- steps: number of steps to take in decreasing chroma

**Value**
character vector of Munsell colours

**Examples**
desaturate("5PB 2/4")
cols <- c("5PB 2/6", "5Y 7/8")
p <- plot_mnsl(c(cols, desaturate(cols), desaturate(cols, 2)))
p + ggplot2::facet_wrap(~ names, ncol = 2)

---

**hue_slice**  
*Plot all colours with the same hue*

**Description**
Plots slices of the Munsell colour system where hue is constant.

**Usage**
hue_slice(hue.name = "all", back.col = "white")

**Arguments**
- hue.name: character vector of the desired hues. Or "all" for all hues.
- back.col: colour for the background

**Value**
ggplot object
Examples

```r
hue_slice("5R")
hue_slice(c("5R", "5P"))
## Not run: hue_slice("all")
```

---

**hvc2mns1**

*Converts a hue, chroma and value to a Munsell colour*

---

**Description**

Takes separate specifications of hue, value and chroma and returns the text specification of that colour.

**Usage**

```
hvc2mns1(hue, value = NULL, chroma = NULL, ...)
```

**Arguments**

- `hue`: a character vector of Munsell hues, or a 3 column data frame containing the hue value and chroma levels
- `value`: a numeric vector of values
- `chroma`: a numeric vector of chromas
- `...`: passed on to `check_mns1`. Use `fix = TRUE` to fix "bad" colours

**Details**

Munsell colours are specified by hue, value and chroma. They take a form like "5PB 5/10" where the first characters represent the hue, followed by a space then the value and chroma separated by a "/". In this package value should be an integer in 0:10 and chroma an even number at most 24. Note that not all possible specifications result in representable colours. Regular recycling rules apply.

**Value**

A character string specification of a hex colour

**See Also**

`check_mns1`, `mns12hex`

**Examples**

```
hvc2mns1("5PB", 5, 10)
# All values of 5PB with chroma 10
hvc2mns1("5PB", 1:9, 10) # note some are undefined
plot_mns1(hvc2mns1("5PB", 1:9, 10))
```
**lighter**

*Make a munsell colour lighter*

**Description**

Increases the value of the Munsell colour.

**Usage**

```
lighter(col, steps = 1)
```

**Arguments**

- `col` character vector of Munsell colours
- `steps` number of steps to take in increasing value

**Value**

character vector of Munsell colours

**Examples**

```
lighter("SPB 2/4")
cols <- c("SPB 2/4", "SY 6/8")
p <- plot_mnsl(c(cols, lighter(cols), lighter(cols, 2)))
p + ggplot2::facet_wrap(~ names, ncol = 2)
# lighter and darker are usually reversible
lighter(darker("SPB 2/4"))
# unless you try to pass though white or black
lighter(darker("SPB 1/4"))
```

---

**mnsl**

*Converts a Munsell colour to hex*

**Description**

Take a character string representation of a Munsell colour and returns the hex specification of that colour

**Usage**

```
mnsl(col, ...)
```

**Arguments**

- `col` a character string representing a Munsell colour.
- `...` passed on to `check_mnsl`. Use `fix = TRUE` to fix "bad" colours
Details

Munsell colours are specified by hue, value and chroma. They take a form like "5PB 5/10" where the first characters represent the hue, followed by a space then the value and chroma separated by a "/". In this package value should be an integer in 0:10 and chroma an even number at most 24. Note that not all possible specifications result in representable colours.

Value

a character string specification of a hex colour

See Also

check_mnsl, hvc2mnsl

Examples

```r
mnsl2hex("5PB 5/10")
# use a munsell colour in a plot
plot.new()
rect(0, 0, 1, 1, col = mnsl("5R 5/10"))
```

---

`mnsl2hvc`  
*Converts a Munsell colour to a hue, chroma and value triplet*

Description

Takes a text specification of a Munsell colour and returns the hue, chroma and value triplet.

Usage

```r
mnsl2hvc(col, ...)  
```

Arguments

- `col`  
a character vector of Munsell colours
- `...`  
  passed on to `check_mnsl`. Use `fix = TRUE` to fix "bad" colours

Details

Munsell colours are specified by hue, value and chroma. They take a form like "5PB 5/10" where the first characters represent the hue, followed by a space then the value and chroma separated by a "/". In this package value should be an integer in 0:10 and chroma an even number at most 24. Note that not all possible specifications result in representable colours.

Value

a data frame with named columns hue, value and chroma containing the hue, value and chroma levels.
See Also

check_mns1, hvc2mns1

Examples

mns12hvc("5PB 5/10")
hvc2mns1(mns12hvc("5PB 5/10"))

mns1_hues

Munsell hues

Description

Returns a character vector of the Munsell hues in hue order starting at 2.5R and excluding grey ("N").

Usage

mns1_hues()

Value

a character vector containing the hue values.

Examples

mns1_hues()

munsell

Munsell colour system.

Description

This package makes it easy to access and manipulate the colours in the munsell colour system. The conversion from munsell specifications to sRGB based on the renotation data from http://www.cis.rit.edu/mcs1/online/munsell.php which is a digitization of Table 1 in Newhall, Nickerson & Judd (1943). The code for conversion can be found in the package directory in inst/raw/getmunsellmap.r

References


pbgyr  \hspace{1cm} Change the hue of a munsell colour

**Description**

Moves the hue of a munsell colour in the direction purple->blue->green->yellow->red->purple

**Usage**

\[ \text{pbgyr}(\text{col}, \text{steps} = 1) \]

**Arguments**

- **col**: character vector of Munsell colours
- **steps**: number of hue steps to take

**Value**

character vector of Munsell colours

**Examples**

```r
my_red <- "2.5R 4/8"
pbgyr(my_red)
plot_mnsl(c(my_red, pbgyr(my_red, 2), pbgyr(my_red, 4)))
```

---

plot_closest  \hspace{1cm} Plot closest Munsell colour to an sRGB colour

**Description**

Take an sRGB colour and plots it along with the closest Munsell colour (using \text{rgb2mns1} to find it)

**Usage**

\[ \text{plot_closest}(R, G = \text{NULL}, B = \text{NULL}, \text{back.col} = \text{"white"}) \]

**Arguments**

- **R**: a numeric vector of red values or a 3 column matrix with the proportions R, G, B in the columns.
- **G**: numeric vector of green values
- **B**: numeric vector of blue values
- **back.col**: colour for the background
plot_hex

Value

ggplot object

See Also

rgb2mns1

Examples

plot_closest(0.1, 0.1, 0.3)
plot_closest(matrix(c(.1, .2, .4, .5, .6, .8), ncol = 3))

plot_hex(hexNcolourL backNcol BwhiteB)

Arguments

hex.colour character vector specifying colours in hex form
back.col specification of background colour of display

Value

A ggplot object

Examples

plot_hex("#000000")
plot_hex(c("#000000","#FFFFFF"))
### Description

Takes munsell text specifications and plots colour squares of them.

### Usage

```r
plot_mnsl(cols, back.col = "white", ...)
```

### Arguments

- `cols` character vector specifying colours in Munsell form
- `back.col` specification of background colour of display
- `...` passed to `check_mnsl`. Add `fix = TRUE` to fix "bad" colours()

### Value

A ggplot object

### Examples

```r
plot_mnsl("5R 5/6")
plot_mnsl("5R 5/6", back.col = "grey40")
p <- plot_mnsl(c("5R 6/6", "5Y 6/6", "5G 6/6", "5B 6/6", "5P 6/6"),
               back.col = "grey40")
p
# returned object is a ggplot object so we can alter the layout
summary(p)
p + ggplot2::facet_wrap(~ num, nrow = 1)
```

---

### Description

Converts an sRGB colour to Munsell

### Usage

```r
rgb2mns1(R, G = NULL, B = NULL)
```
**Arguments**

- **R** a numeric vector of red values or a 3 column matrix with the proportions R, G, B in the columns.
- **G** numeric vector of green values
- **B** numeric vector of blue values

**See Also**

- `plot_closest`

**Examples**

```r
rgb2mns1(0.1, 0.1, 0.3)
rgb2mns1(matrix(c(.1, .2, .4, .6, .8), ncol = 3))
plot_closest(matrix(c(.1, .2, .4, .5, .6, .8), ncol = 3))
```

---

**rygbp**  
**Change the hue of a munsell colour**

**Description**

Moves the hue of a munsell colour in the direction red->yellow->green->blue->purple->red

**Usage**

```r
rygbp(col, steps = 1)
```

**Arguments**

- **col** character vector of Munsell colours
- **steps** number of hue steps to take

**Value**

character vector of Munsell colours

**Examples**

```r
my_red <- "10R 4/8"
rygbp(my_red)
plot_mns1(c(my_red, rygbp(my_red, 2), rygbp(my_red, 4)))
```
saturate

Make a munsell colour more saturated

Description

Increases the chroma of the Munsell colour by step steps (multiples of 2).

Usage

saturate(col, steps = 1)

Arguments

col character vector of Munsell colours
steps number of steps to take in increasing chroma

Value

character vector of Munsell colours

Examples

saturate("5PB 2/4")
cols <- c("5PB 2/2", "5Y 7/6")
p <- plot_mnsl(c(cols, saturate(cols), saturate(cols, 2)))
p + ggplot2::facet_wrap(~ names, ncol = 2)

seq_mnsl

Generate a sequence of Munsell colours

Description

Generates a sequence of Munsell colours. The sequence is generated by finding the closest munsell colours to a equidistant sequence of colours in # LUV space.

Usage

seq_mnsl(from, to, n, fix = FALSE)

Arguments

from character string of first Munsell colour
to character string of last Munsell colournnumber of colours in sequencefix Should colours outside of the gamut be fixed? Passed on to fix_mnsl
value_slice

**Value**

character vector of Munsell colours

**Examples**

```r
seq_mnsl(“5R 2/4”, “5R 5/16”, 4)
plot_mnsl(seq_mnsl(“5R 2/4”, “5R 5/16”, 4))
plot_mnsl(seq_mnsl(“5R 5/6”,
    complement(“5R 5/6”), 5))
```

---

value_slice Plot all colours with the same value

**Description**

Plots slices of the Munsell colour system where value is constant.

**Usage**

```r
value_slice(value.name = 1:10, back.col = "white")
```

**Arguments**

- value.name integer vector of the desired values.
- back.col colour for the background

**Value**

ggplot object

**Examples**

```r
value_slice(2)
value_slice(c(2, 4))
# all values
## Not run: value_slice(1:10)
```
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