

GRAPHICS PART 2

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ARGUMENTS OF PAR() 1/2

| Argument | Description |
|----------|--|
| adj | Controls the text alignment: 0 – to the left, 0.5 – centered, 1 – to the right |
| bg | Sets the background color of the plot |
| bty | Controls the type of overline around the plot (o, l, 7, c, u,]) – overline looks like given value (n is for lack of overline) |
| cex | Controls the size of text and symbols, default value is 1. Additional functions available like cex.axis (axis size), cex.main (title text size), etc. |
| col | Controls the color of symbols. Additional functions available like col.lab (color of axis title), col.sub (color of the subtitle), etc. |
| font | A number controlling the text style (1 – normal, 2 – bold, 3 – italic, 4 – bold italic). Additional functions available like font.axis, font.lab, etc. |

ARGUMENTS OF PAR() 2/2

| Argument | Description |
|----------|--|
| las | A number controlling the rotation of titles around axis (0 – parallel to the axis, 1 – horizontal, 2 - perpendicular to the axis, 3 – vertical). |
| lty | A number controlling the style of the line (0=blank, 1=solid (default), 2=dashed, 3=dotted, 4=dotdash, 5=longdash, 6=twodash) |
| lwd | Parameter for the line width (like in cex, default value 1) |
| pch | Point symbol (number in range 0-25 or sign in quotation marks) |
| ps | Point size in text and symbols |
| pty | Size of the plot area (s – squared, m – maximal) |
| tck | Size of axis ticks, as a fraction of height and width of the plot (for 1 there is a net drawn on the whole plot area) |

TYPES OF POINTS IN R

In `par()` function
Argument `pch =`

pch = _

| | | | | | | | | | |
|---|---|----|---|----|---|----|---|----|---|
| 1 | ○ | 6 | ▽ | 11 | ⊗ | 16 | ● | 21 | ○ |
| 2 | △ | 7 | ✉ | 12 | 田 | 17 | ▲ | 22 | □ |
| 3 | + | 8 | * | 13 | ⊗ | 18 | ◆ | 23 | ◆ |
| 4 | × | 9 | ◇ | 14 | □ | 19 | ● | 24 | △ |
| 5 | ◇ | 10 | ⊕ | 15 | ■ | 20 | ● | 25 | ▽ |

COLOR IN R

Source of the plot:

<https://www.datanovia.com/en/blog/awesome-list-of-657-r-color-names/>

#1

| | | | | |
|---------------|----------------|-------------|----------------|-----------------|
| white | bisque2 | burlywood4 | coral4 | darkgreen |
| aliceblue | bisque3 | cadetblue | cornflowerblue | darkgrey |
| antiquewhite | bisque4 | cadetblue1 | cornsilk | darkkhaki |
| antiquewhite1 | black | cadetblue2 | cornsilk1 | darkmagenta |
| antiquewhite2 | blanchedalmond | cadetblue3 | cornsilk2 | darkolivegreen |
| antiquewhite3 | blue | cadetblue4 | cornsilk3 | darkolivegreen1 |
| antiquewhite4 | blue1 | chartreuse | cornsilk4 | darkolivegreen2 |
| aquamarine | blue2 | chartreuse1 | cyan | darkolivegreen3 |
| aquamarine1 | blue3 | chartreuse2 | cyan1 | darkolivegreen4 |
| aquamarine2 | blue4 | chartreuse3 | cyan2 | darkorange |
| aquamarine3 | blueviolet | chartreuse4 | cyan3 | darkorange1 |
| aquamarine4 | brown | chocolate | cyan4 | darkorange2 |
| azure | brown1 | chocolate1 | darkblue | darkorange3 |
| azure1 | brown2 | chocolate2 | darkcyan | darkorange4 |
| azure2 | brown3 | chocolate3 | darkgoldenrod | darkorchid |
| azure3 | brown4 | chocolate4 | darkgoldenrod1 | darkorchid1 |
| azure4 | burlywood | coral | darkgoldenrod2 | darkorchid2 |
| beige | burlywood1 | coral1 | darkgoldenrod3 | darkorchid3 |
| bisque | burlywood2 | coral2 | darkgoldenrod4 | darkorchid4 |
| bisque1 | burlywood3 | coral3 | darkgray | darkred |

#2

| | | | | |
|----------------|--------------|------------|--------|--------|
| darksalmon | deepskyblue | ghostwhite | gray8 | gray28 |
| darkseagreen | deepskyblue1 | gold | gray9 | gray29 |
| darkseagreen1 | deepskyblue2 | gold1 | gray10 | gray30 |
| darkseagreen2 | deepskyblue3 | gold2 | gray11 | gray31 |
| darkseagreen3 | deepskyblue4 | gold3 | gray12 | gray32 |
| darkseagreen4 | dimgray | gold4 | gray13 | gray33 |
| darkslateblue | dimgrey | goldenrod | gray14 | gray34 |
| darkslategray | dodgerblue | goldenrod1 | gray15 | gray35 |
| darkslategray1 | dodgerblue1 | goldenrod2 | gray16 | gray36 |
| darkslategray2 | dodgerblue2 | goldenrod3 | gray17 | gray37 |
| darkslategray3 | dodgerblue3 | goldenrod4 | gray18 | gray38 |
| darkslategray4 | dodgerblue4 | gray | gray19 | gray39 |
| darkslategrey | firebrick | gray0 | gray20 | gray40 |
| darkturquoise | firebrick1 | gray1 | gray21 | gray41 |
| darkviolet | firebrick2 | gray2 | gray22 | gray42 |
| deeppink | firebrick3 | gray3 | gray23 | gray43 |
| deeppink1 | firebrick4 | gray4 | gray24 | gray44 |
| deeppink2 | floralwhite | gray5 | gray25 | gray45 |
| deeppink3 | forestgreen | gray6 | gray26 | gray46 |
| deeppink4 | gainsboro | gray7 | gray27 | gray47 |

#3

| | | | | |
|--------|--------|-------------|--------|--------|
| gray48 | gray68 | gray88 | grey0 | grey20 |
| gray49 | gray69 | gray89 | grey1 | grey21 |
| gray50 | gray70 | gray90 | grey2 | grey22 |
| gray51 | gray71 | gray91 | grey3 | grey23 |
| gray52 | gray72 | gray92 | grey4 | grey24 |
| gray53 | gray73 | gray93 | grey5 | grey25 |
| gray54 | gray74 | gray94 | grey6 | grey26 |
| gray55 | gray75 | gray95 | grey7 | grey27 |
| gray56 | gray76 | gray96 | grey8 | grey28 |
| gray57 | gray77 | gray97 | grey9 | grey29 |
| gray58 | gray78 | gray98 | grey10 | grey30 |
| gray59 | gray79 | gray99 | grey11 | grey31 |
| gray60 | gray80 | gray100 | grey12 | grey32 |
| gray61 | gray81 | green | grey13 | grey33 |
| gray62 | gray82 | green1 | grey14 | grey34 |
| gray63 | gray83 | green2 | grey15 | grey35 |
| gray64 | gray84 | green3 | grey16 | grey36 |
| gray65 | gray85 | green4 | grey17 | grey37 |
| gray66 | gray86 | greenyellow | grey18 | grey38 |
| gray67 | gray87 | grey | grey19 | grey39 |

#4

| | | | | | |
|--------|--------|--------|------------|--|----------------|
| grey40 | grey60 | grey80 | grey100 | | ivory4 |
| grey41 | grey61 | grey81 | honeydew | | khaki |
| grey42 | grey62 | grey82 | honeydew1 | | khaki1 |
| grey43 | grey63 | grey83 | honeydew2 | | khaki2 |
| grey44 | grey64 | grey84 | honeydew3 | | khaki3 |
| grey45 | grey65 | grey85 | honeydew4 | | khaki4 |
| grey46 | grey66 | grey86 | hotpink | | lavender |
| grey47 | grey67 | grey87 | hotpink1 | | lavenderblush |
| grey48 | grey68 | grey88 | hotpink2 | | lavenderblush1 |
| grey49 | grey69 | grey89 | hotpink3 | | lavenderblush2 |
| grey50 | grey70 | grey90 | hotpink4 | | lavenderblush3 |
| grey51 | grey71 | grey91 | indianred | | lavenderblush4 |
| grey52 | grey72 | grey92 | indianred1 | | lawngreen |
| grey53 | grey73 | grey93 | indianred2 | | lemonchiffon |
| grey54 | grey74 | grey94 | indianred3 | | lemonchiffon1 |
| grey55 | grey75 | grey95 | indianred4 | | lemonchiffon2 |
| grey56 | grey76 | grey96 | ivory | | lemonchiffon3 |
| grey57 | grey77 | grey97 | ivory1 | | lemonchiffon4 |
| grey58 | grey78 | grey98 | ivory2 | | lightblue |
| grey59 | grey79 | grey99 | ivory3 | | lightblue1 |

#5

| | | | | |
|----------------------|-----------------|------------------|-------------------|--------------|
| lightblue2 | lightpink2 | lightsteelblue3 | mediumblue | mistyrose2 |
| lightblue3 | lightpink3 | lightsteelblue4 | mediumorchid | mistyrose3 |
| lightblue4 | lightpink4 | lightyellow | mediumorchid1 | mistyrose4 |
| lightcoral | lightsalmon | lightyellow1 | mediumorchid2 | moccasin |
| lightcyan | lightsalmon1 | lightyellow2 | mediumorchid3 | navajowhite |
| lightcyan1 | lightsalmon2 | lightyellow3 | mediumorchid4 | navajowhite1 |
| lightcyan2 | lightsalmon3 | lightyellow4 | mediumpurple | navajowhite2 |
| lightcyan3 | lightsalmon4 | limegreen | mediumpurple1 | navajowhite3 |
| lightcyan4 | lightseagreen | linen | mediumpurple2 | navajowhite4 |
| lightgoldenrod | lightskyblue | magenta | mediumpurple3 | navy |
| lightgoldenrod1 | lightskyblue1 | magenta1 | mediumpurple4 | navyblue |
| lightgoldenrod2 | lightskyblue2 | magenta2 | mediumseagreen | oldlace |
| lightgoldenrod3 | lightskyblue3 | magenta3 | mediumslateblue | olivedrab |
| lightgoldenrod4 | lightskyblue4 | magenta4 | mediumspringgreen | olivedrab1 |
| lightgoldenrodyellow | lightslateblue | maroon | mediumturquoise | olivedrab2 |
| lightgray | lightslategray | maroon1 | mediumvioletred | olivedrab3 |
| lightgreen | lightslategrey | maroon2 | midnightblue | olivedrab4 |
| lightgrey | lightsteelblue | maroon3 | mintcream | orange |
| lightpink | lightsteelblue1 | maroon4 | mistyrose | orange1 |
| lightpink1 | lightsteelblue2 | mediumaquamarine | mistyrose1 | orange2 |

#6

| | | | | |
|----------------|----------------|------------|-------------|------------|
| orange3 | paleturquoise2 | plum | rosybrown4 | seashell2 |
| orange4 | paleturquoise3 | plum1 | royalblue | seashell3 |
| orangered | paleturquoise4 | plum2 | royalblue1 | seashell4 |
| orangered1 | palevioletred | plum3 | royalblue2 | sienna |
| orangered2 | palevioletred1 | plum4 | royalblue3 | sienna1 |
| orangered3 | palevioletred2 | powderblue | royalblue4 | sienna2 |
| orangered4 | palevioletred3 | purple | saddlebrown | sienna3 |
| orchid | palevioletred4 | purple1 | salmon | sienna4 |
| orchid1 | papayawhip | purple2 | salmon1 | skyblue |
| orchid2 | peachpuff | purple3 | salmon2 | skyblue1 |
| orchid3 | peachpuff1 | purple4 | salmon3 | skyblue2 |
| orchid4 | peachpuff2 | red | salmon4 | skyblue3 |
| palegoldenrod | peachpuff3 | red1 | sandybrown | skyblue4 |
| palegreen | peachpuff4 | red2 | seagreen | slateblue |
| palegreen1 | peru | red3 | seagreen1 | slateblue1 |
| palegreen2 | pink | red4 | seagreen2 | slateblue2 |
| palegreen3 | pink1 | rosybrown | seagreen3 | slateblue3 |
| palegreen4 | pink2 | rosybrown1 | seagreen4 | slateblue4 |
| paleturquoise | pink3 | rosybrown2 | seashell | slategray |
| paleturquoise1 | pink4 | rosybrown3 | seashell1 | slategray1 |

#7

| | | |
|--------------|------------|-------------|
| slategray2 | tan | turquoise4 |
| slategray3 | tan1 | violet |
| slategray4 | tan2 | violetred |
| slategrey | tan3 | violetred1 |
| snow | tan4 | violetred2 |
| snow1 | thistle | violetred3 |
| snow2 | thistle1 | violetred4 |
| snow3 | thistle2 | wheat |
| snow4 | thistle3 | wheat1 |
| springgreen | thistle4 | wheat2 |
| springgreen1 | tomato | wheat3 |
| springgreen2 | tomato1 | wheat4 |
| springgreen3 | tomato2 | whitesmoke |
| springgreen4 | tomato3 | yellow |
| steelblue | tomato4 | yellow1 |
| steelblue1 | turquoise | yellow2 |
| steelblue2 | turquoise1 | yellow3 |
| steelblue3 | turquoise2 | yellow4 |
| steelblue4 | turquoise3 | yellowgreen |

PALETTES IN R - BASIC

Palette: base R

Generating a color vector:

`rainbow(n)`

`heat.colors(n)`

`terrain.colors(n)`

`topo.colors(n)`

`cm.colors(n)`



PALETTES IN R - CONTINUOUS

Palette: Viridis

*Pallets for black and white printing,
adapted to colorblindness*

```
library("viridis")
```

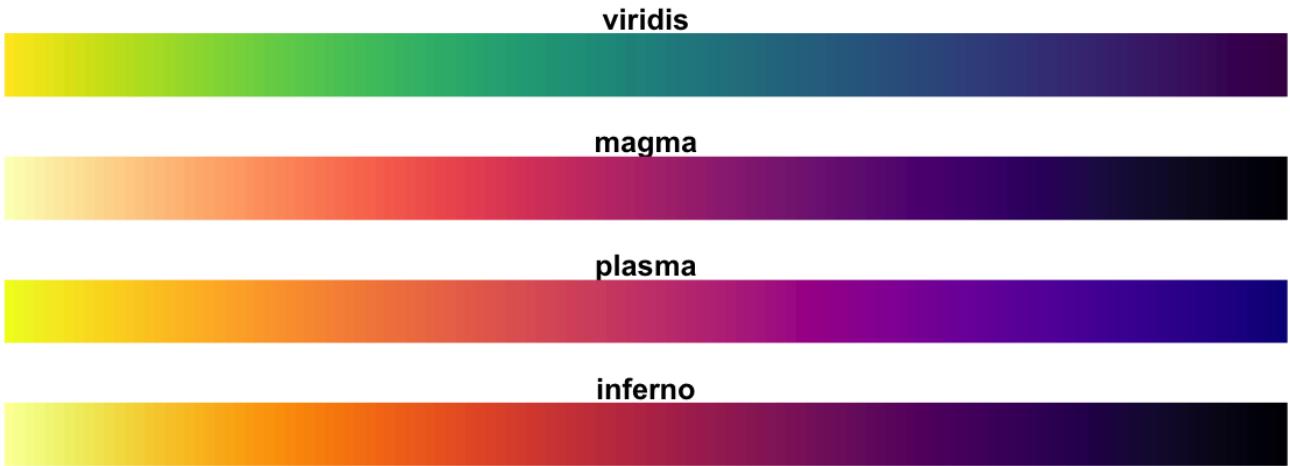
Generating a vector of colours:

```
viridis(n)
```

```
magma(n)
```

```
inferno(n)
```

```
plasma(n)
```



PALETTES IN R - MIXED

Palette: Wes Anderson

*16 palettes, inspired by Wes
Anderson movies*

```
library(wesanderson)
```

Generating a vector of colors
(continuous or discrete)

```
wes_palette(name, n,  
type = c("discrete",  
"continuous"))
```



PALLETS IN R - DISCRETE

Palette: RColorBrewer

Color sets, some are adapted to colourblindness

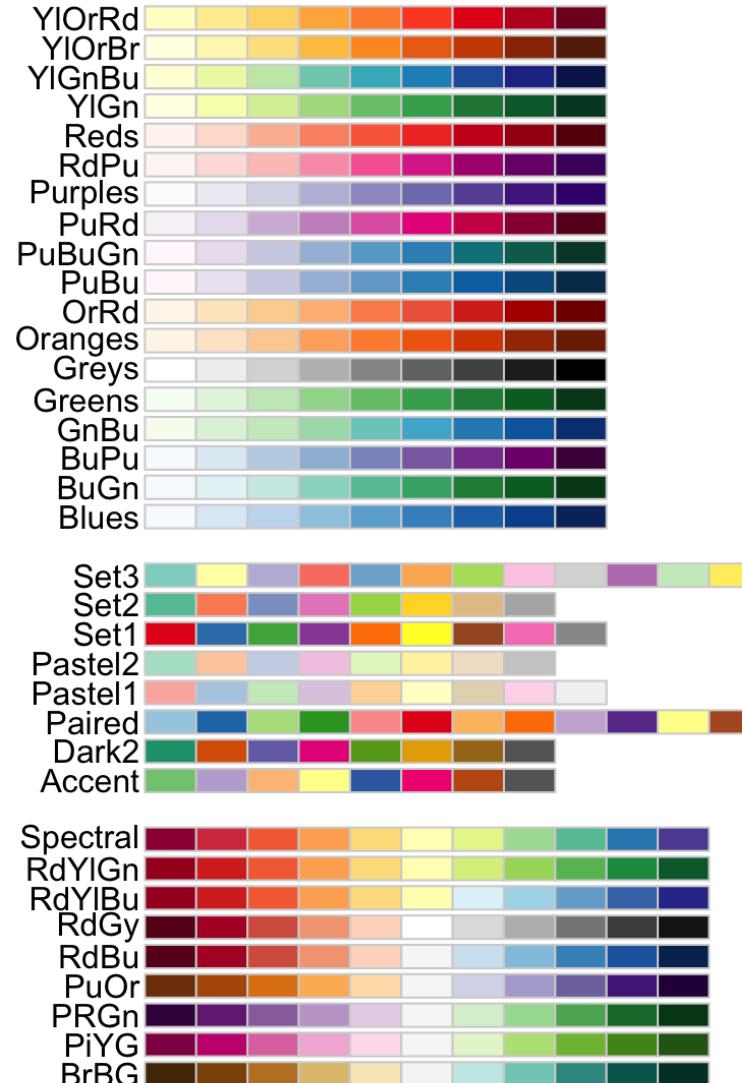
```
library(RColorBrewer)
```

Palletes that are colorblind friendly:

```
display.brewer.all(colorblindFriendly = TRUE)
```

Generating a set of colours (not more than available in a given set)

```
brewer.pal(n = 5, name = "Set3")
```



ADDITIONAL SOURCES WITH INFORMATION ABOUT GRAPHICS IN R

Visualization with base R:

<http://www.sthda.com/english/wiki/r-base-graphs>

<https://bookdown.org/hneth/i2ds/3-visualize.html>

https://intro2r.com/graphics_base_r.html

Visualization in ggplot2():

[this will be discussed in the Advanced Visualization classes]

https://intro2r.com/graphics_r.html