Coloring a Plot with Hex Values and Color Palette

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In this article, you'll learn about colors in R programming. More specifically, different colors names used in R, plots using color HEX and RGB values, and built-in color palettes in R.

We can visually improve our plots by coloring them. This is generally done with the `col` graphical parameter.

We can specify the name of the color we want as a string. Let us look at an example.

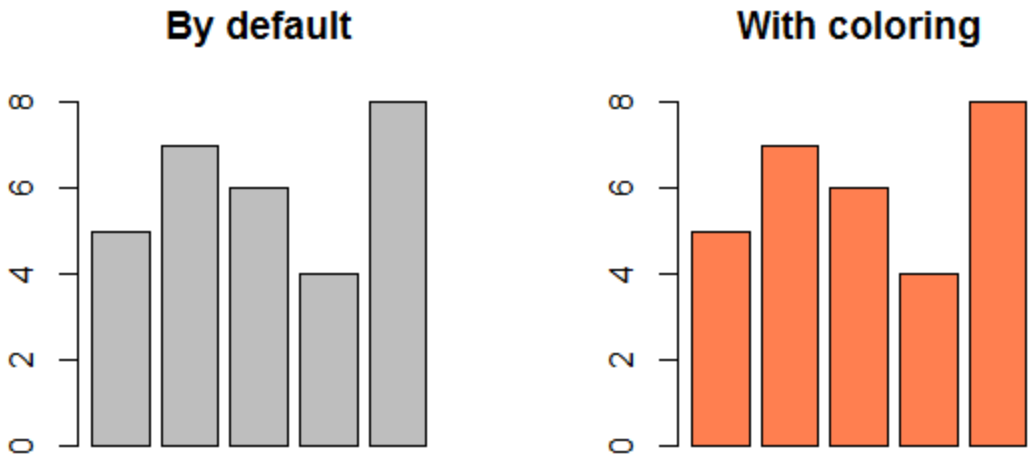
We use the following

`temp`
vector to create

barplot

throughout this section.

```
temp <- c(5,7,6,4,8)
barplot(temp, main="By default")
barplot(temp, col="coral", main="With coloring")
```



Here we use the color `coral`. Try replacing it with `green`, `blue`, `violet` etc. and look at the difference.

Using Color Names

R programming has names for 657 colors. You can take a look at them all with the `colors()` function, or simply check this R color pdf.

```
> colors()
[1] "white"             "aliceblue"         "antiquewhite"
[4] "antiquewhite1"     "antiquewhite2"     "antiquewhite3"
[7] "antiquewhite4"     "aquamarine"        "aquamarine1"
...
[655] "yellow3"         "yellow4"           "yellowgreen"
```

This returns a vector of all the color names in alphabetical order with the first element being `white`. You can color your plot by indexing this vector.

For example, `col=colors()[655]` is the same as `col="yellow3"`.

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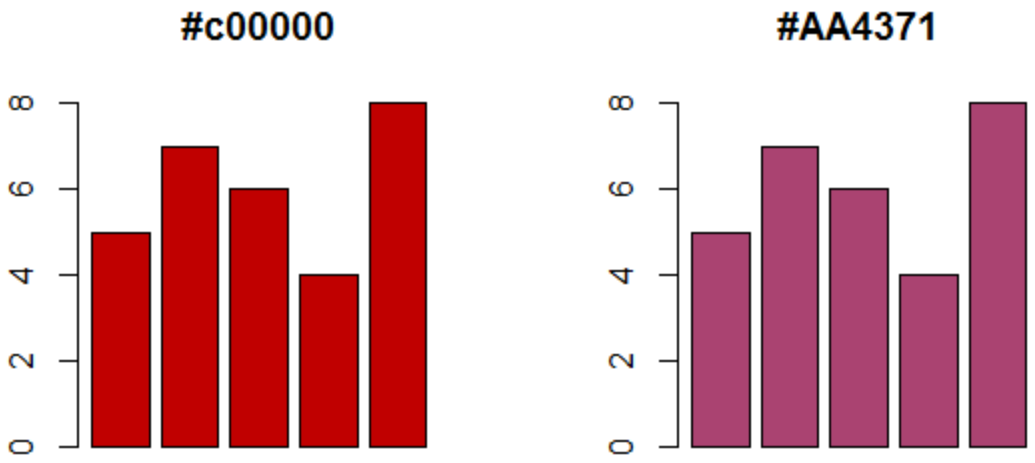
Using Hex Values as Colors

Instead of using a color name, color can also be defined with a hexadecimal value.

We define a color as a 6 hexadecimal digit number of the form `#RRGGBB`. Where the `RR` is for red, `GG` for green and `BB` for blue and value ranges from `00` to `FF`.

For example, `#FF0000` would be red and `#00FF00` would be green similarly, `#FFFFFF` would be white and `#000000` would be black.

```
barplot(temp, col="#c00000", main="#c00000")
barplot(temp, col="#AA4371", main="#AA4371")
```



Using RGB Values

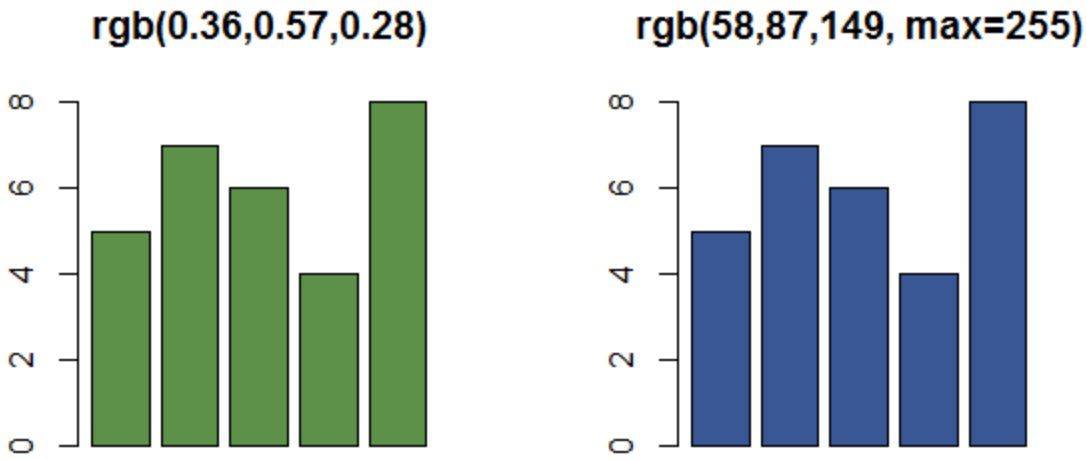
The function `rgb()` allows us to specify red, green and blue component with a number between 0 and 1.

This function returns the corresponding hex code discussed above.

```
> rgb(0, 1, 0)
[1] "#00FF00"
> rgb(0.3, 0.7, 0.9)
[1] "#4DB3E6"
```

We can specify in the range 0 to 255 with the additional argument `max=255`.

```
> rgb(55,0,77, max=255)
[1] "#37004D"
```



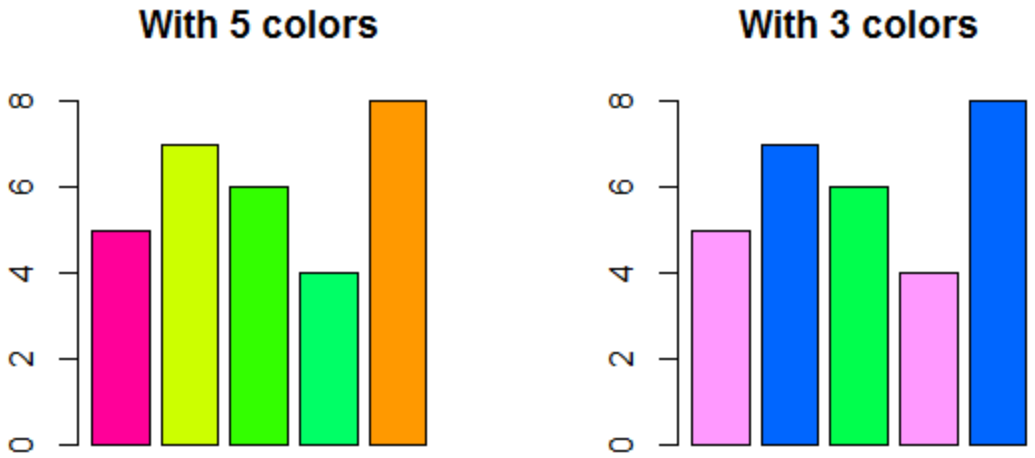
Color Cycling in R

We can color each bar of the barplot with a different color by providing a vector of colors.

If the number of colors provided is less than the number of bars, the color vector is recycled.

We can see this in the following example.

```
barplot(temp, col=c("#FF0099","#CCFF00","#33FF00",
"#00FF66","#FF9900"), main="With 5 colors")
barplot(temp, col=c("#FF99FF","#0066FF","#00FF4D"), main="With 3 colors")
```



Using Color Palette

R programming offers 5 built in color palettes which can be used to quickly generate color vectors of desired length.

They are: `rainbow()`, `heat.colors()`, `terrain.colors()`, `topo.colors()` and `cm.colors()`. We pass in the number of colors that we want.

```
> rainbow(5)
[1] "#FF0000FF" "#CCFF00FF" "#00FF66FF" "#0066FFFF" "#CC00FFFF"
```

Notice above that the hexadecimal numbers are 8 digit long. The last two digit is the transparency level with `FF` being opaque and `00` being fully transparent.

```
barplot(temp, col=rainbow(5), main="rainbow")
barplot(temp, col=heat.colors(5), main="heat.colors")
barplot(temp, col=terrain.colors(5), main="terrain.colors")
barplot(temp, col=topo.colors(5), main="topo.colors")
```

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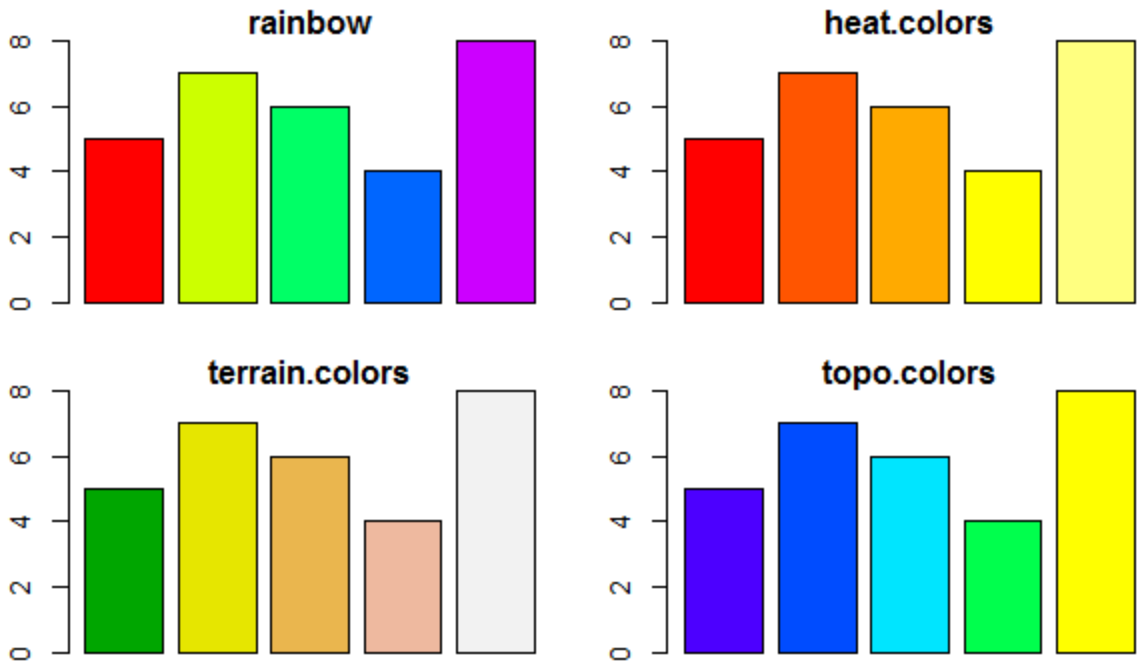

For more info, visit R Color Palettes

You can try out `cm.colors()` for yourself.