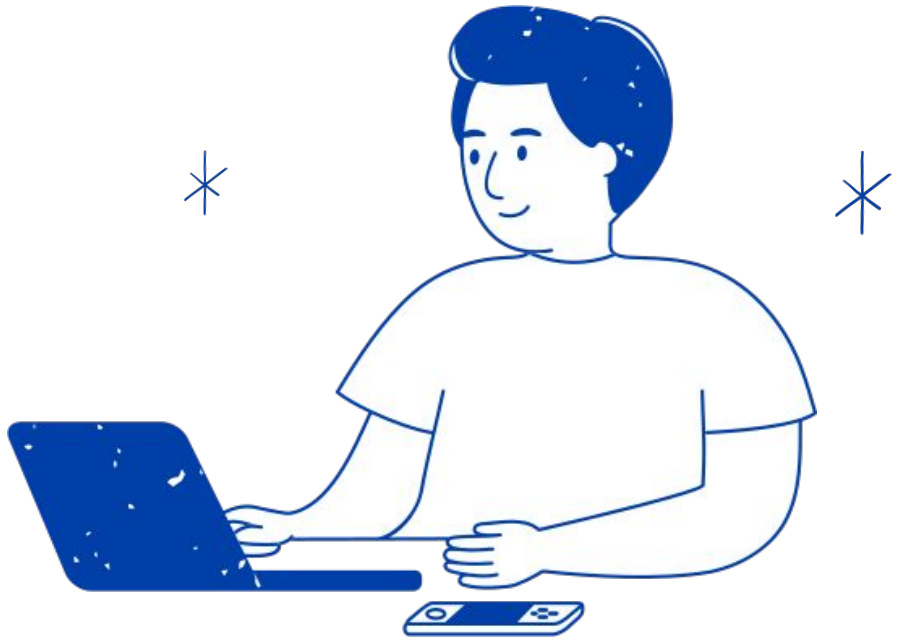
Basic plot in R

09/03/2025

R Graphics

- Histogram
- Boxplot
- Barplot
- Pie charts
- Scatterplot



Dataset

```
> data <- read.csv("/home/nguyen/Downloads/smartphones.csv")
> dim(data)
[1] 1816    8
> head(data)
                                  Smartphone    Brand          Model RAM Storage  Color Free Final.Price
1          Realme C55 8/256GB Sunshower Libre   Realme            C55   8     256 Yellow  Yes      231.60
2     Samsung Galaxy M23 5G 4/128GB Azul Libre  Samsung     Galaxy M23   4     128   Blue  Yes      279.00
3 Motorola Moto G13 4/128GB Azul Lavanda Libre Motorola       Moto G13   4     128   Blue  Yes      179.01
4     Xiaomi Redmi Note 11S 6/128GB Gris Libre   Xiaomi Redmi Note 11S   6     128   Gray  Yes      279.99
5      Nothing Phone (2) 12/512GB Blanco Libre  Nothing      Phone (2)  12     512  White  Yes      799.00
6         Motorola Moto E32s 4/64GB Gris Libre Motorola      Moto E32s   4      64   Gray  Yes      148.52
>
```

Smartphone Name: The unique identifier or model name of the smartphone.

Brand: Smartphone brand.

Model: Smartphone brand model.

RAM (Random Access Memory): The amount of memory available for multitasking.

Storage: capacity of the smartphone.

Color: Color of the smarthpone.

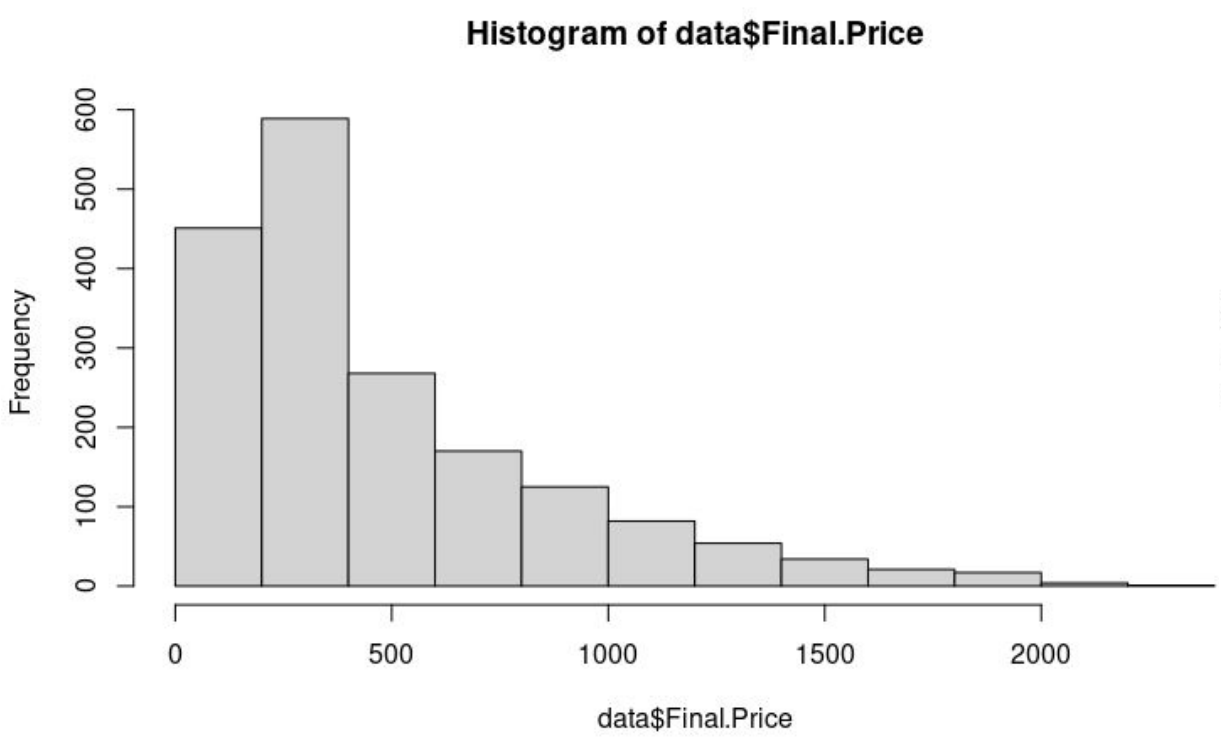
Free: Yes/No if the smartphone is attached to a cell company contract.

Price: The cost of the smartphone in the respective currency.

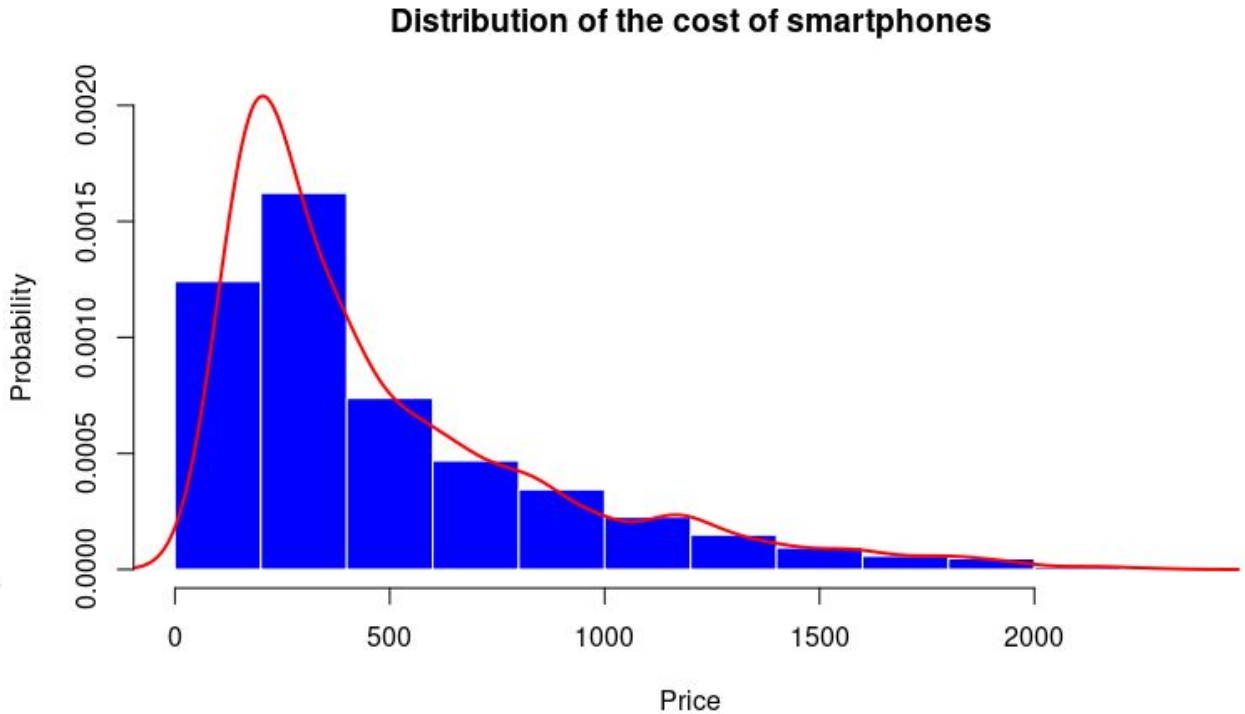
https://www.kaggle.com/datasets/juanmerinobermejo/smartphones-price-dataset

Histogram

- hist(var, col, border, xlab, ylab, main, prob, xlim, ylim)
- line(density(na.omit(var)), col, lwd)




```
hist(data$Final.Price)
```

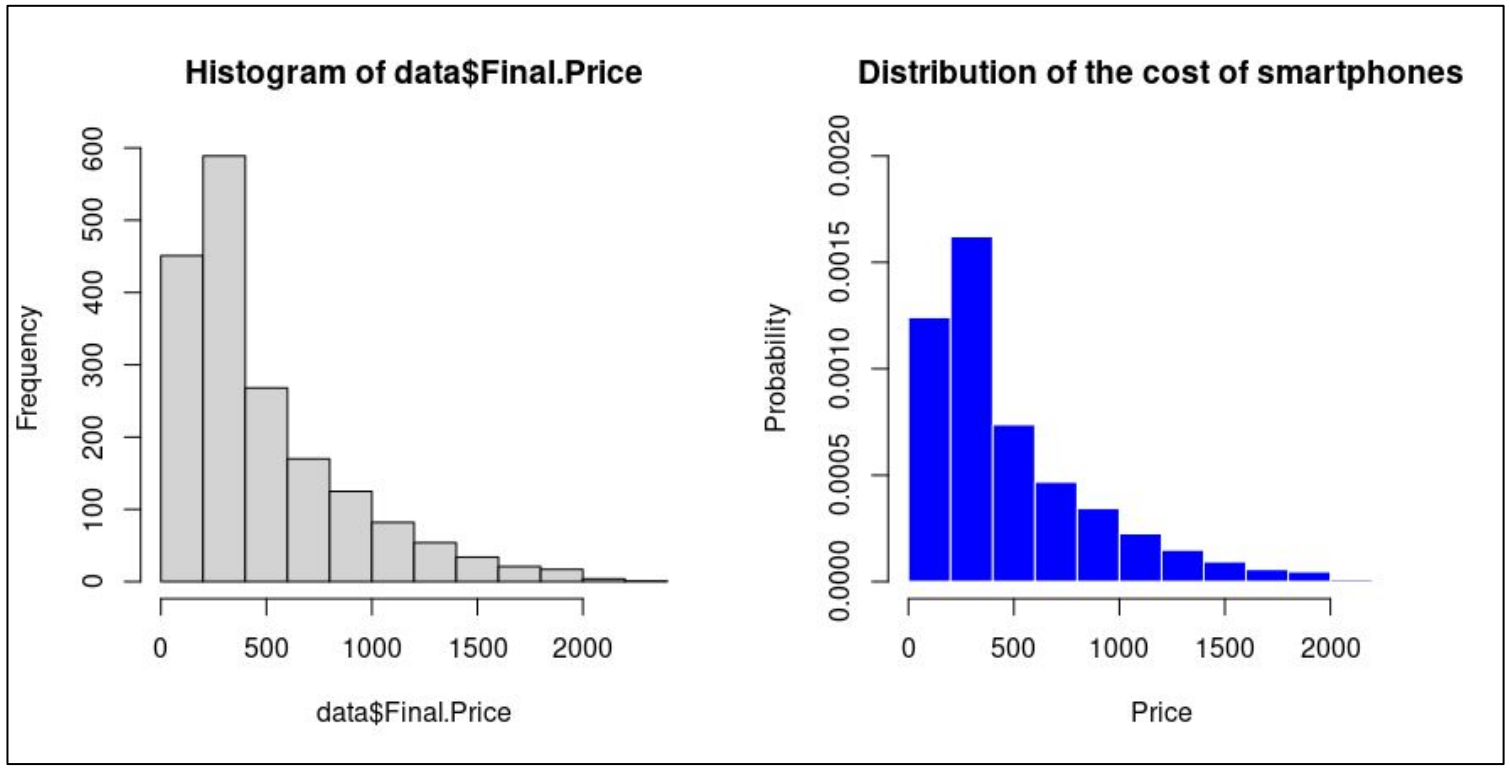



```
hist(data$Final.Price, col="blue", border="white",
     xlab="Price", ylab="Probability",
     main="Distribution of the cost of smartphones",
     prob=TRUE,ylim=c(0,0.002))
lines(density(na.omit(data$Final.Price)), col="red", lwd=2)
```

The number of rows

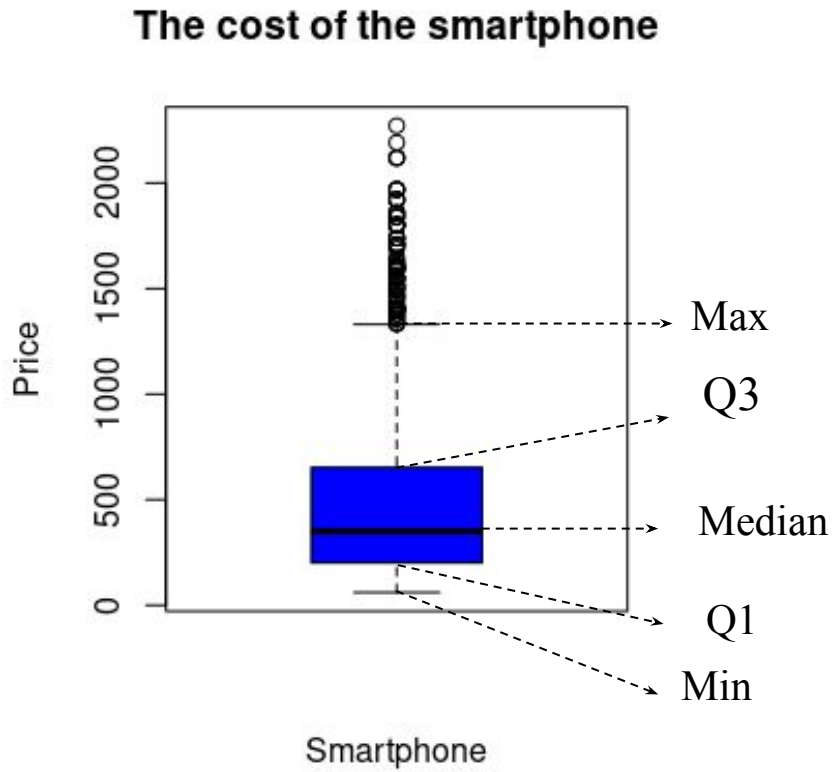
The number of columns

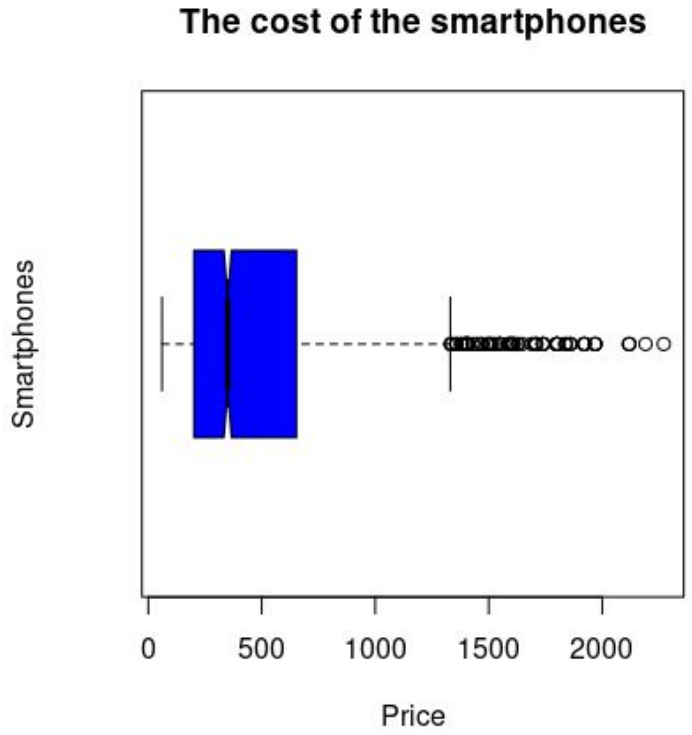
```
par(mfrow = c(1,2))
hist(data$Final.Price)
hist(data$Final.Price, col="blue", border="white",
     xlab="Price", ylab="Probability",
     main="Distribution of the cost of smartphones",
     prob=TRUE,ylim=c(0,0.002))
lines(density(na.omit(data$Final.Price)), col="red", lwd=2)
```



Boxplot

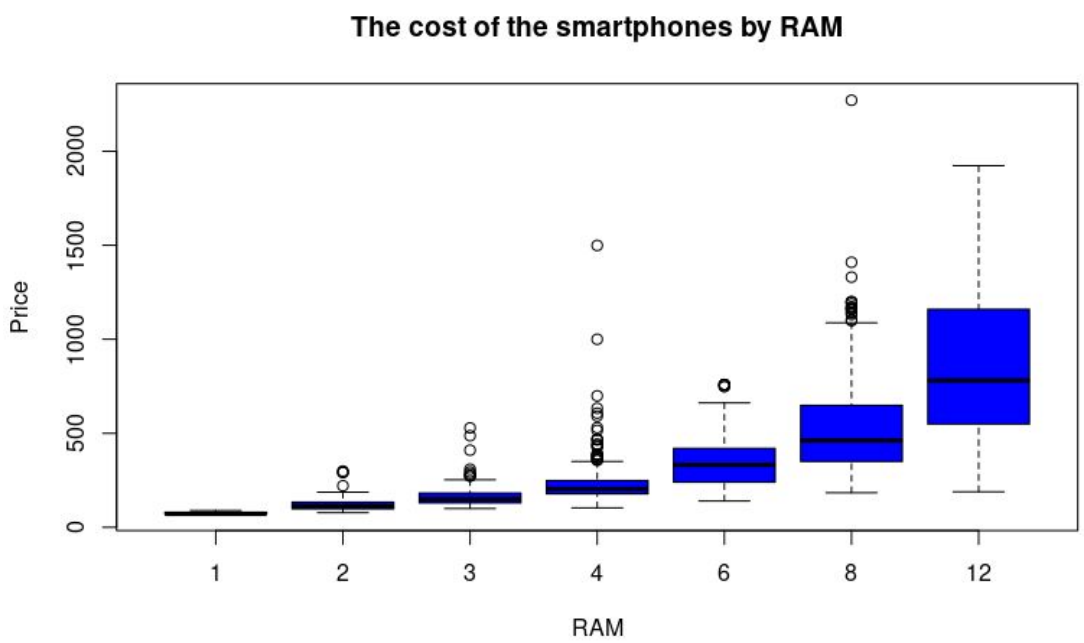
- boxplot(var, col, border, xlab, ylab, main, xlim, ylim, notch, horizontal)
- boxplot(var1~var2, col, border, xlab, ylab, main, xlim, ylim, notch, horizontal)



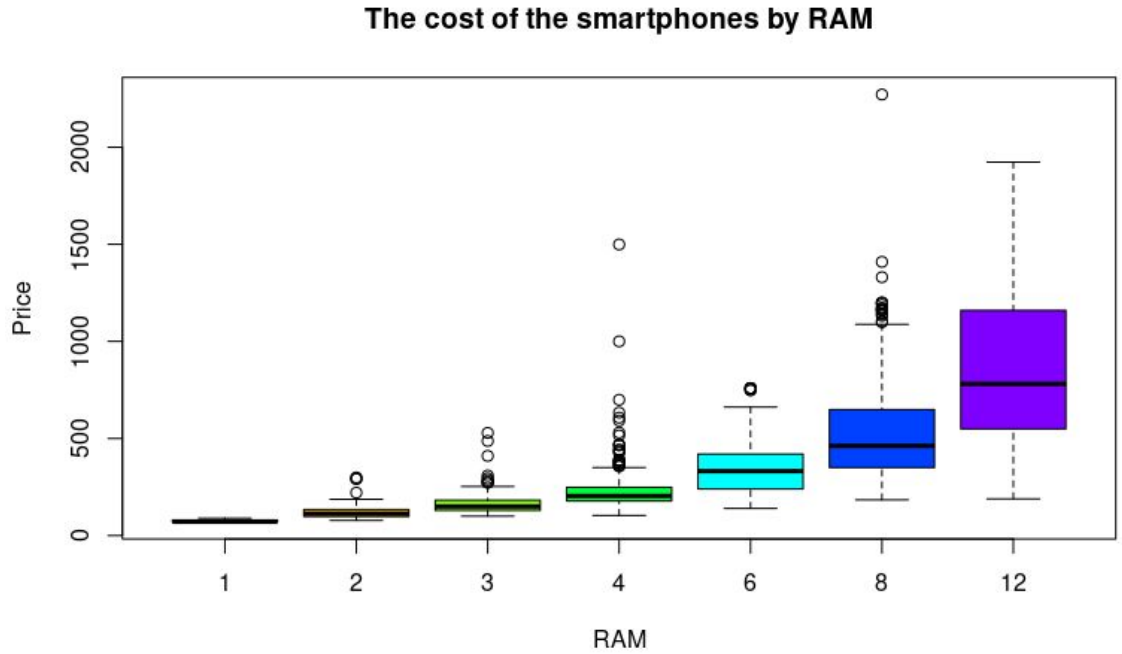



```
boxplot(data$Final.Price, col="blue",
        xlab="Smartphones",ylab="Price",
        main="The cost of the smartphones")
```

```
boxplot(data$Final.Price, col="blue", notch=T,
        xlab="Price",ylab="Smartphones",
        main="The cost of the smartphones",
        horizontal=T)
```



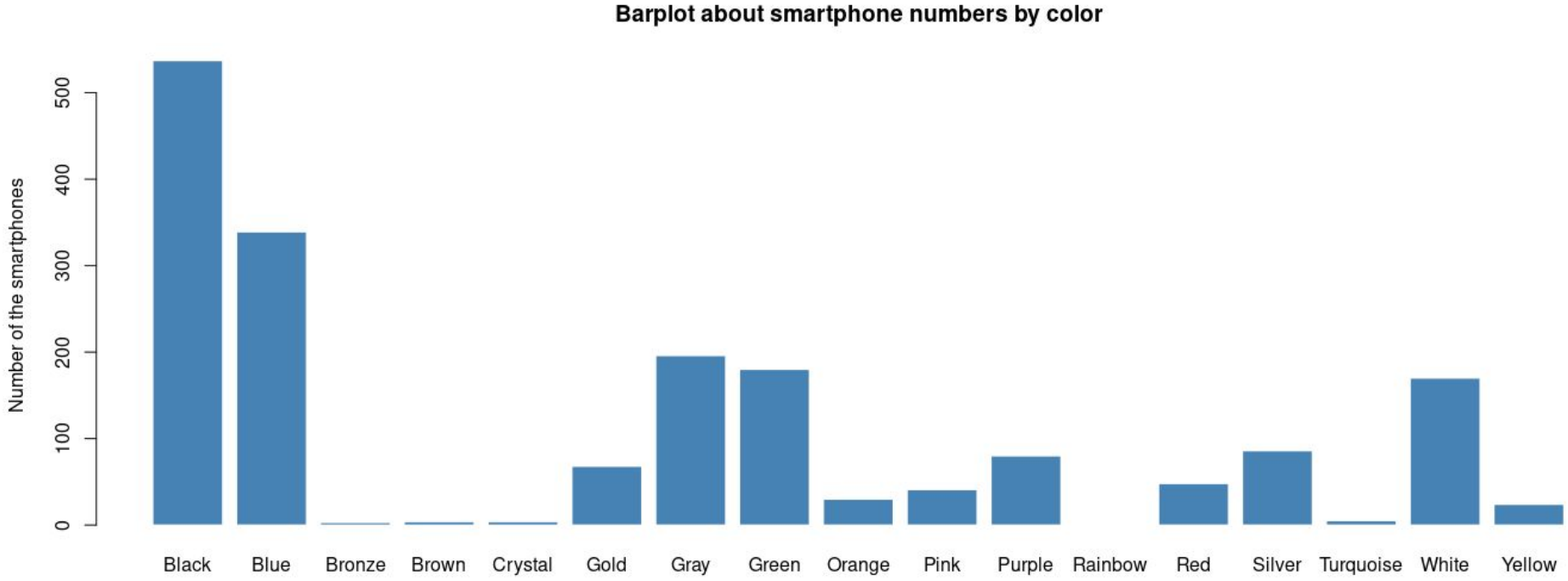

```
boxplot(data$Final.Price~data$RAM, col="blue",
        xlab="RAM",ylab="Price",
        main="The cost of the smartphones by RAM",
        horizontal=F)
```




```
boxplot(data$Final.Price~data$RAM,
        col=rainbow(length(unique(data$RAM))),
        xlab="RAM",ylab="Price",
        main="The cost of the smartphones by RAM",
        horizontal=F)
```

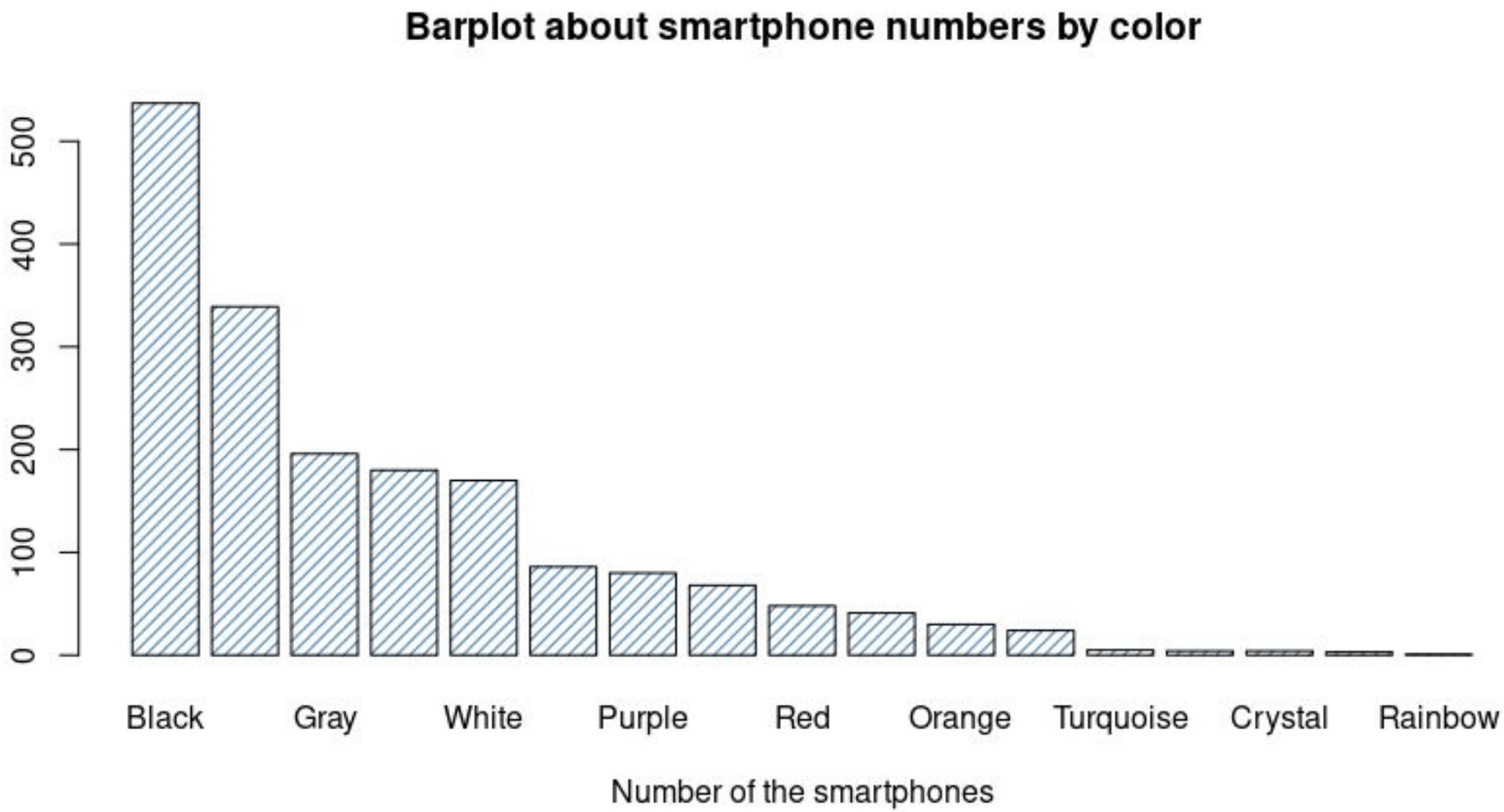
Barplot

barplot(var, col, border, xlab, ylab, main, cex.axis, cex.name, density, las, horiz)

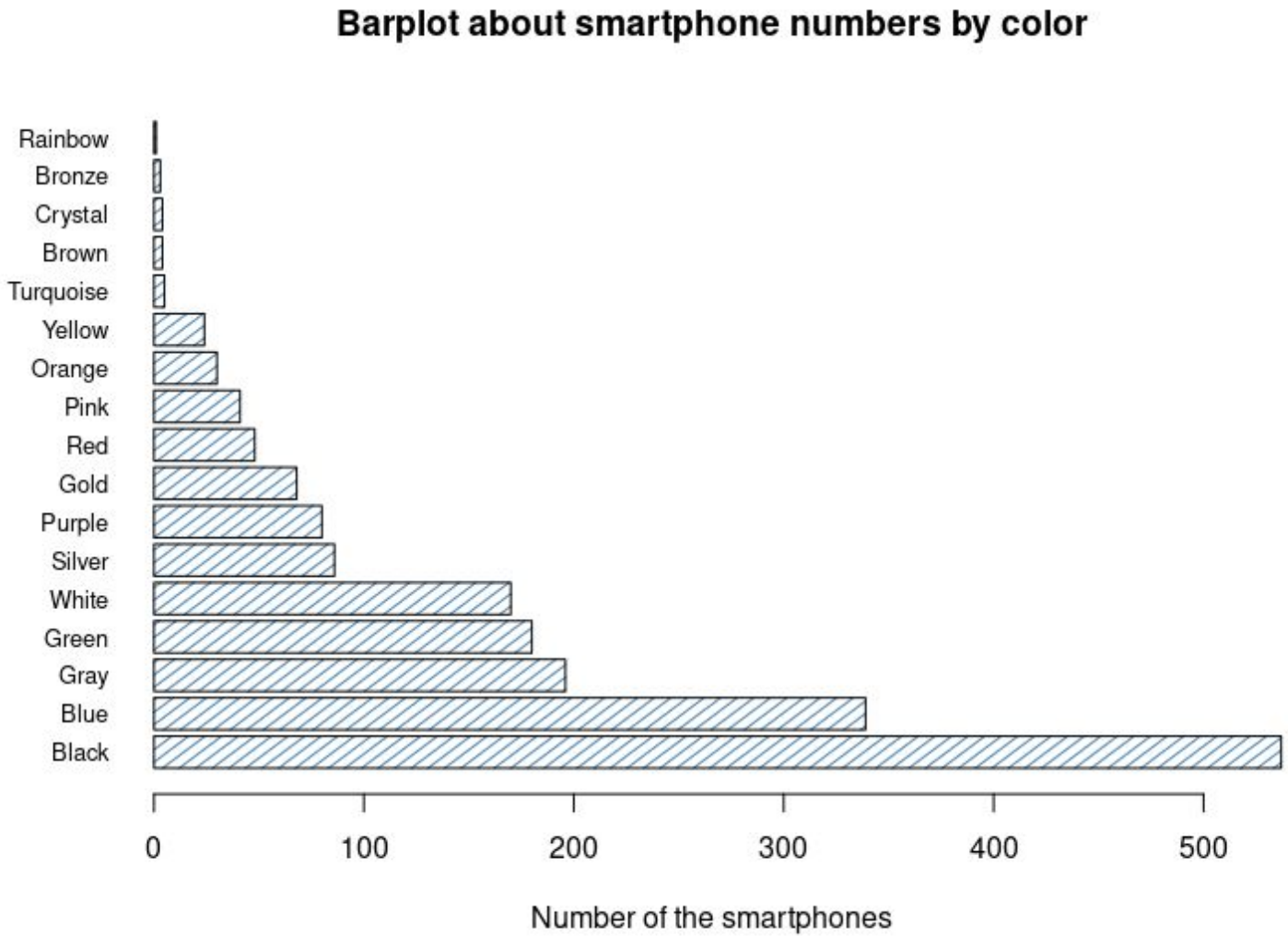



```
> dt <- table(data$Color)
> dt

    Black      Blue    Bronze     Brown   Crystal      Gold      Gray     Green    Orange
      537       339         3         4         4        68       196       180        30
     Pink    Purple   Rainbow       Red    Silver Turquoise     White    Yellow
       41        80         1        48        86         5       170        24
> barplot(dt, col="steelblue", border="white", xlab="Color", ylab="Number of the smartphones",
+         main="Barplot about smartphone numbers by color",
+         cex.axis=1, cex.names=1)
>
```




```r
barplot(dt[order(dt, decreasing=TRUE)], col="steelblue",
        xlab="Number of the smartphones",
        main="Barplot about smartphone numbers by color",
        cex.names=1, density=20)
```



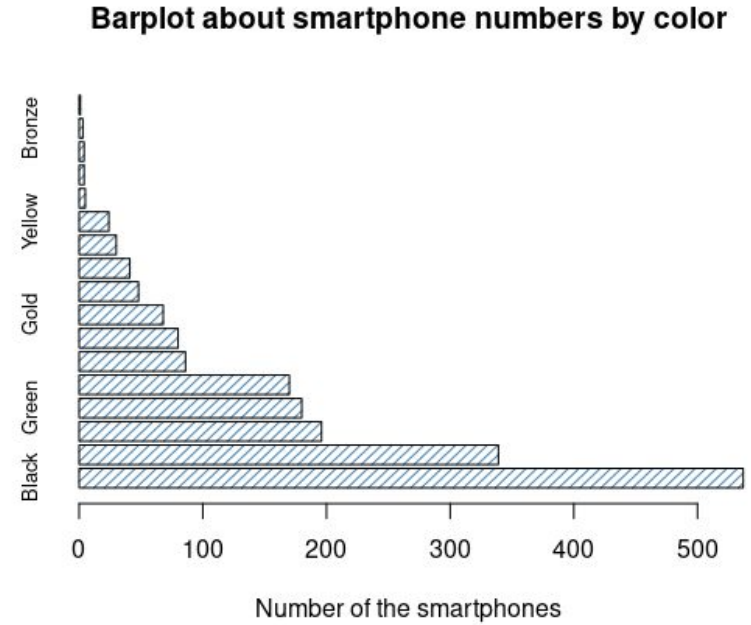

```
barplot(dt[order(dt, decreasing=TRUE)], col="steelblue",
        xlab="Number of the smartphones",
        main="Barplot about smartphone numbers by color",
        las=1, cex.names=0.8, density=20, horiz=TRUE)
```

The `las` argument allows to change the orientation of the axis labels:

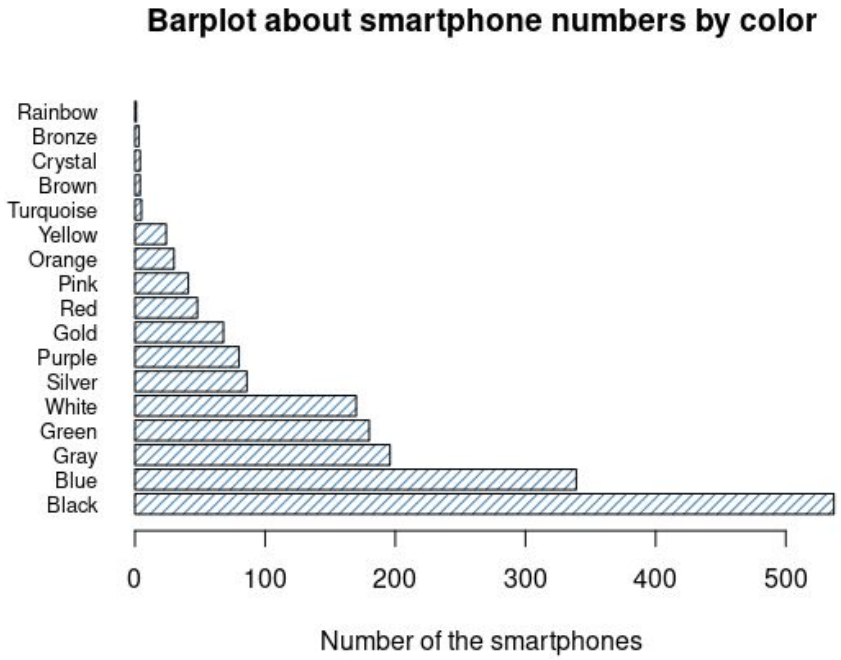
- `0` : always parallel to the axis
- `1` : always horizontal
- `2` : always perpendicular to the axis
- `3` : always vertical.

This is specially helpful for horizontal bar chart.

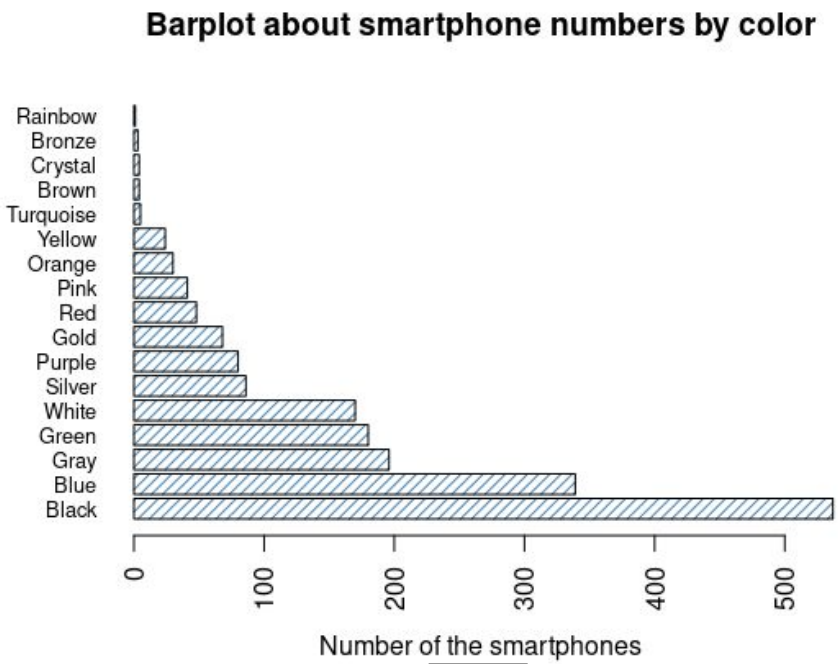
0



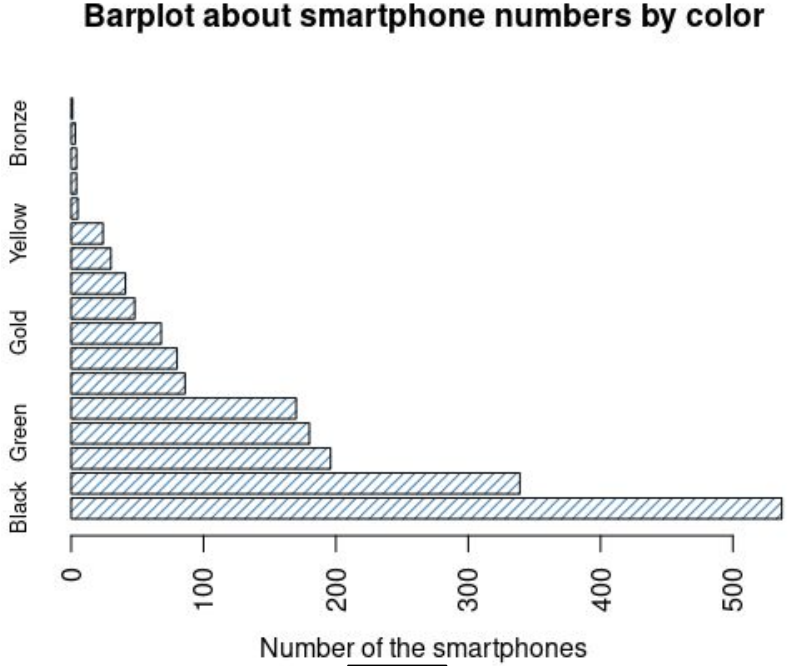
1



2

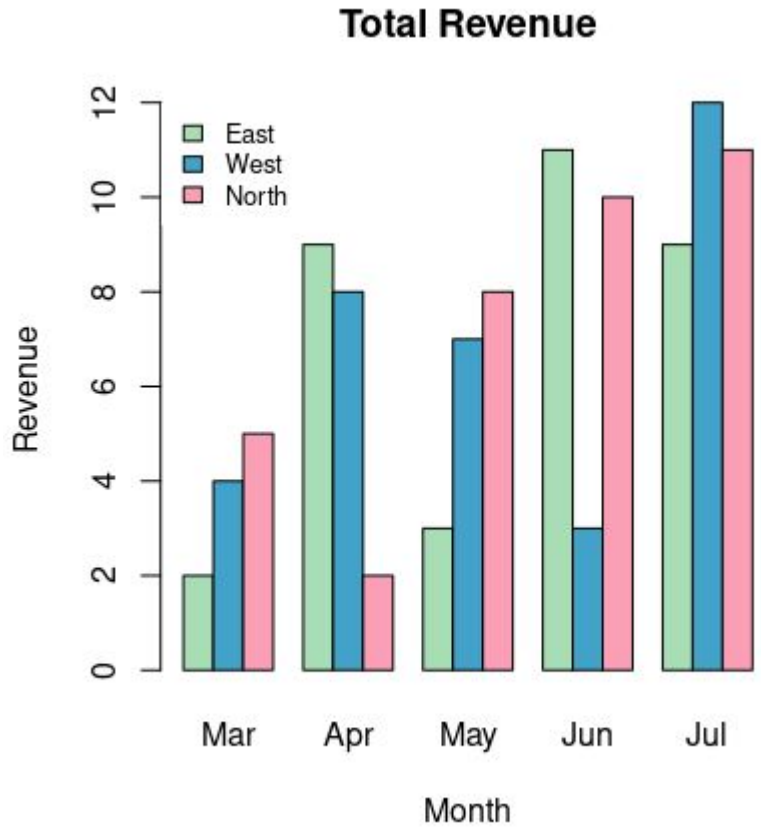


3

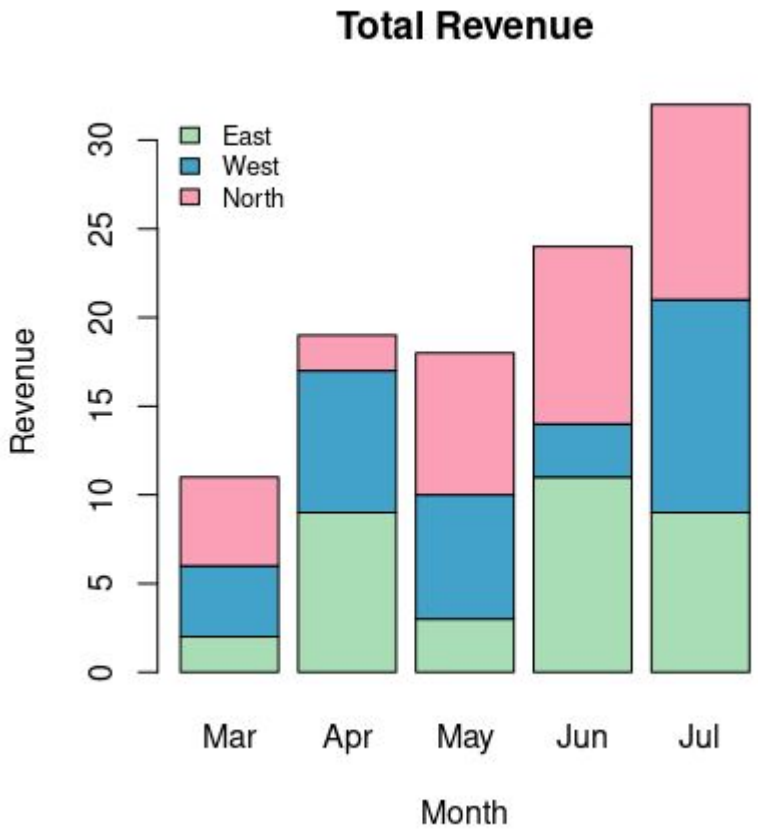


```r
colors = c("#a8ddb5", "#43a2ca", "#fa9fb5")
months <- c("Mar", "Apr", "May", "Jun", "Jul")
regions <- c("East", "West", "North")
## Create the matrix of the values.
Values <- matrix(c(2, 9, 3, 11, 9, 4, 8, 7, 3, 12, 5, 2, 8, 10, 11),
                 nrow = 3, ncol = 5, byrow = TRUE)
```

```
> Values
     [,1] [,2] [,3] [,4] [,5]
[1,]    2    9    3   11    9
[2,]    4    8    7    3   12
[3,]    5    2    8   10   11
>
```

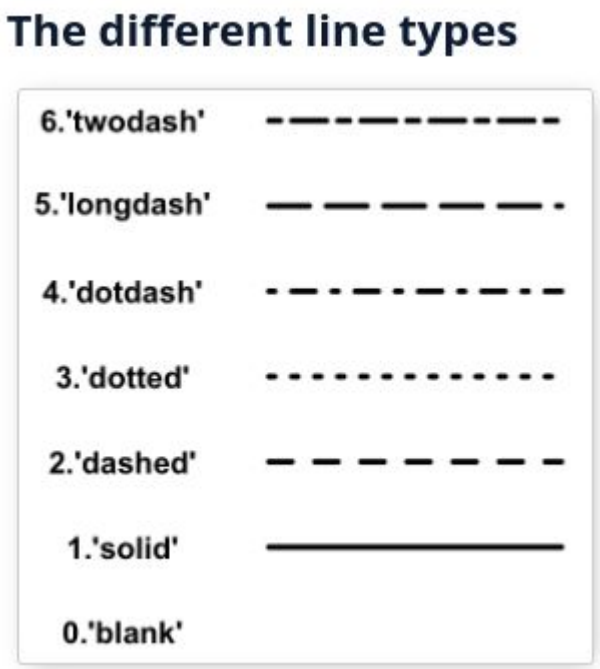


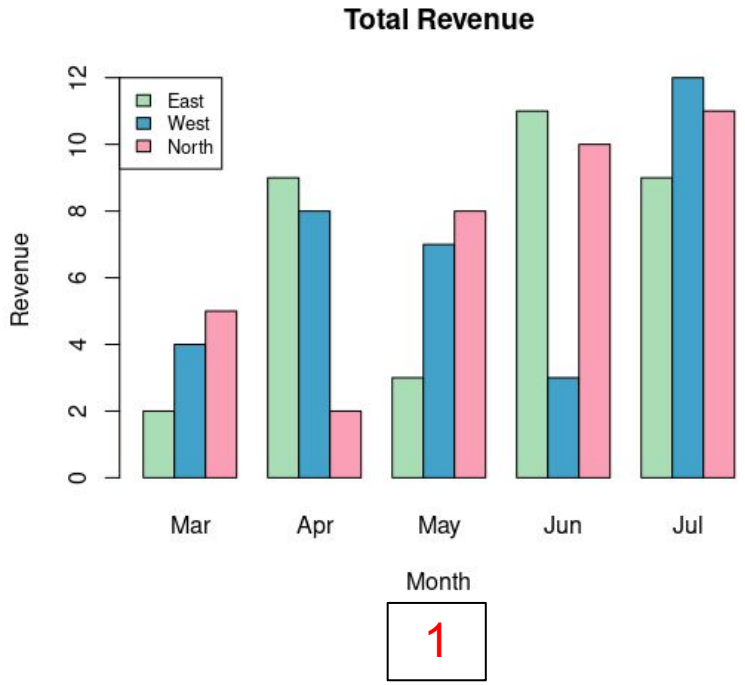

```r
barplot(Values, main = "Total Revenue", names.arg = months,
        xlab = "Month", ylab = "Revenue",
        col = colors, beside = TRUE)
legend("topleft", regions, box.lty=0, cex = 0.8, fill = colors)
```

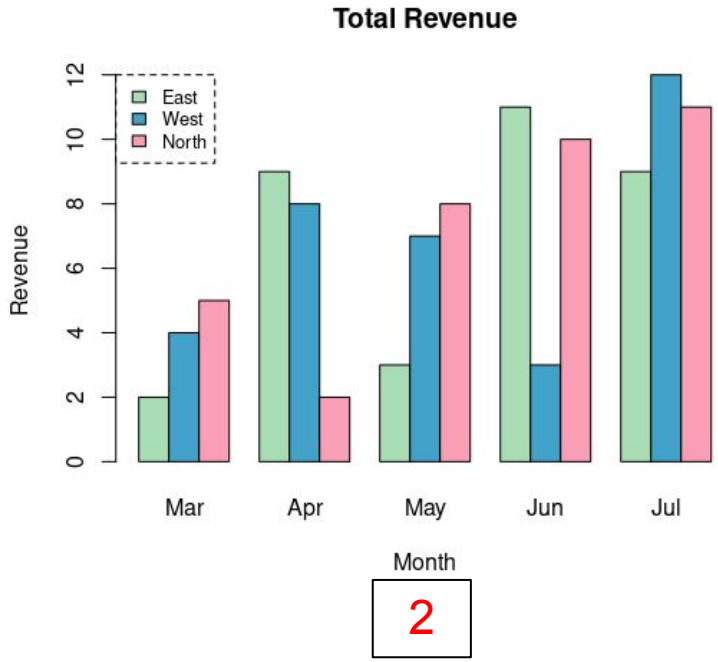


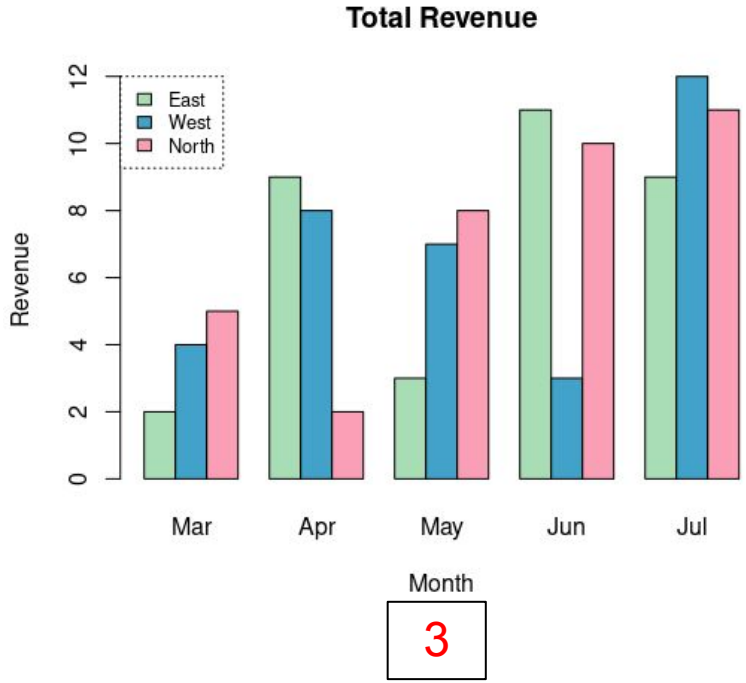

```r
barplot(Values, main="Total Revenue", names.arg=months,
        xlab="Month", ylab="Revenue", col=colors)
legend("topleft", regions, box.lty=0, cex=0.8, fill=colors)
```

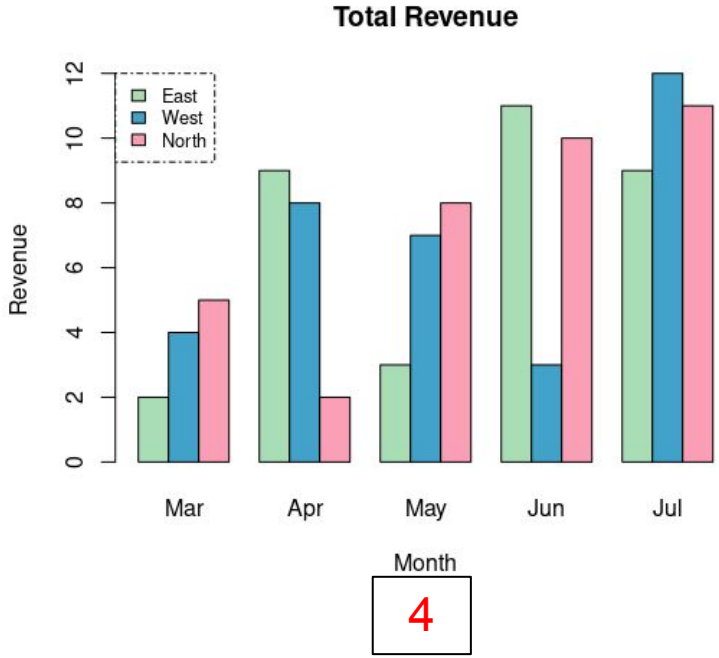
box.lty = (0,1,2,3,4,5,6)







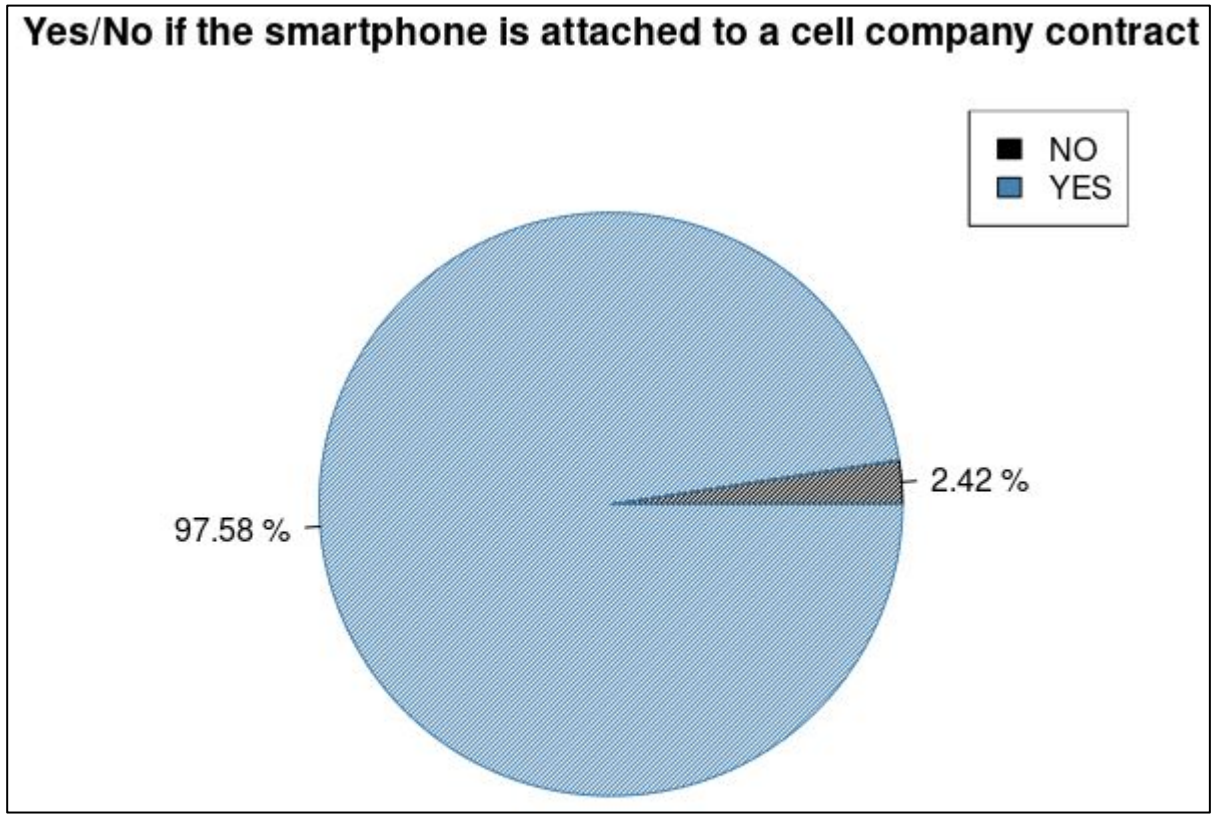




Pie charts

pie(var, label, col, main, density)

legend(position, legend, cex, fill)



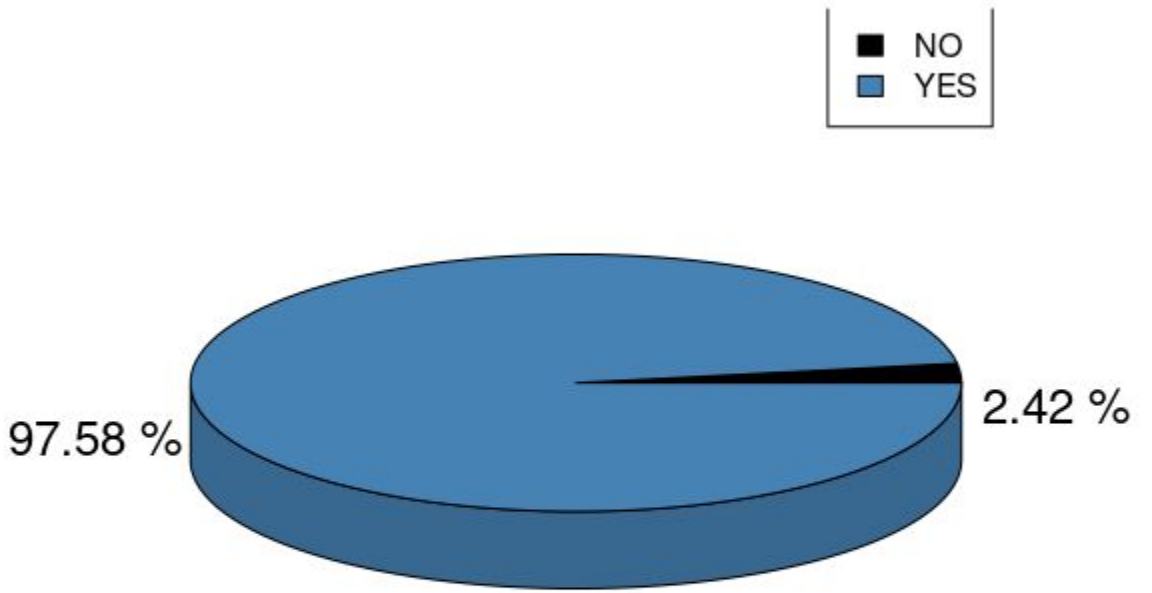

```
> df <- table(data$Free)
> df

  No  Yes
  44 1772
> piepercent <- round((df*100/sum(df)),2)
> piepercent

   No   Yes
 2.42 97.58
```

“bottomright”, “bottom”,
“bottomleft”, “left”, “topleft”,
“top”, “topright”, “right”,
“center”

```
pie(df, labels= paste(piepercent, "%"), col=c("black", "steelblue"), density=50,
main="Yes/No if the smartphone is attached to a cell company contract")
legend("topright", c("NO", "YES"), cex=1, fill=c("black", "steelblue"))
```

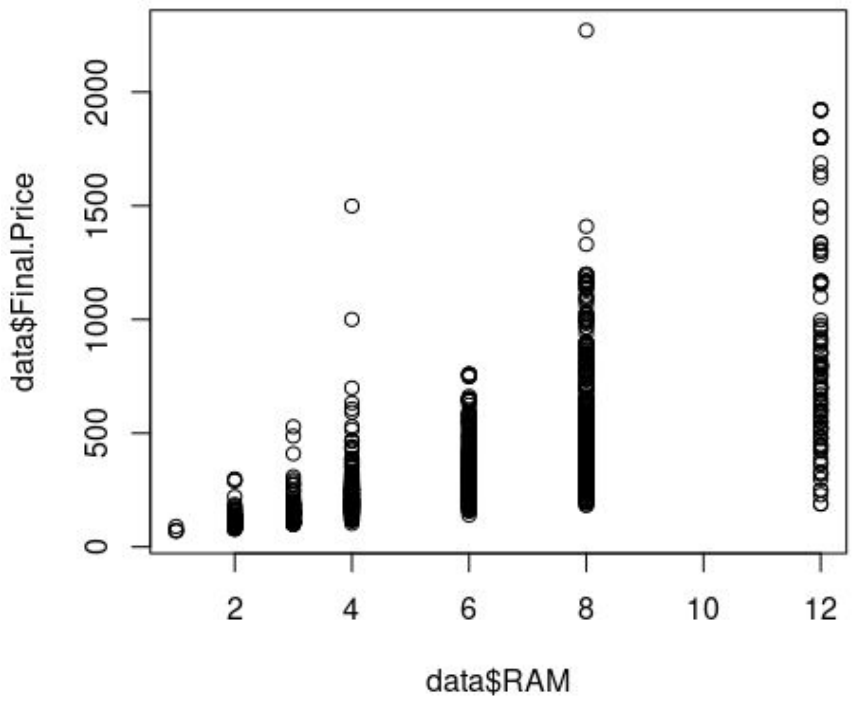



```
install.packages("plotrix")
library(plotrix)
pie3D(df, labels= paste(piepercent, "%"), col=c("black", "steelblue"),
      main="Yes/No if the smartphone is attached to a cell company contract")
legend("topright", c("NO", "YES"), cex=1, fill=c("black", "steelblue"))
```

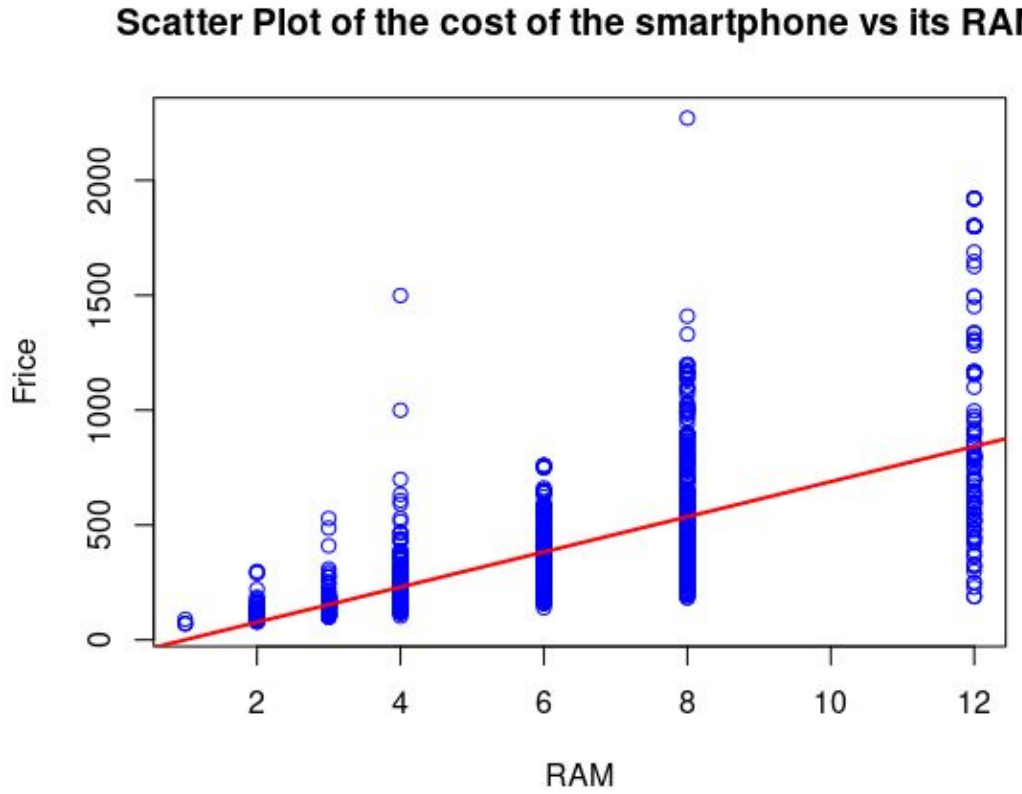
Plot and scatterplot

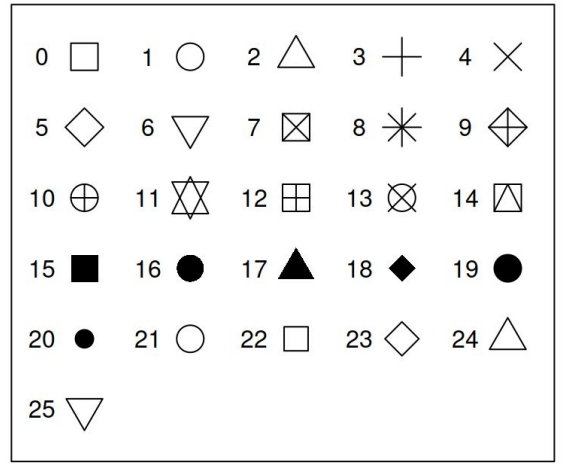
plot(var1~var2, pch, col, xlab, ylab, main, xlim, ylim)

scatterplot(var1~ var2 | group, pch, col, smooth, grid, frame, xlab, ylab, main)

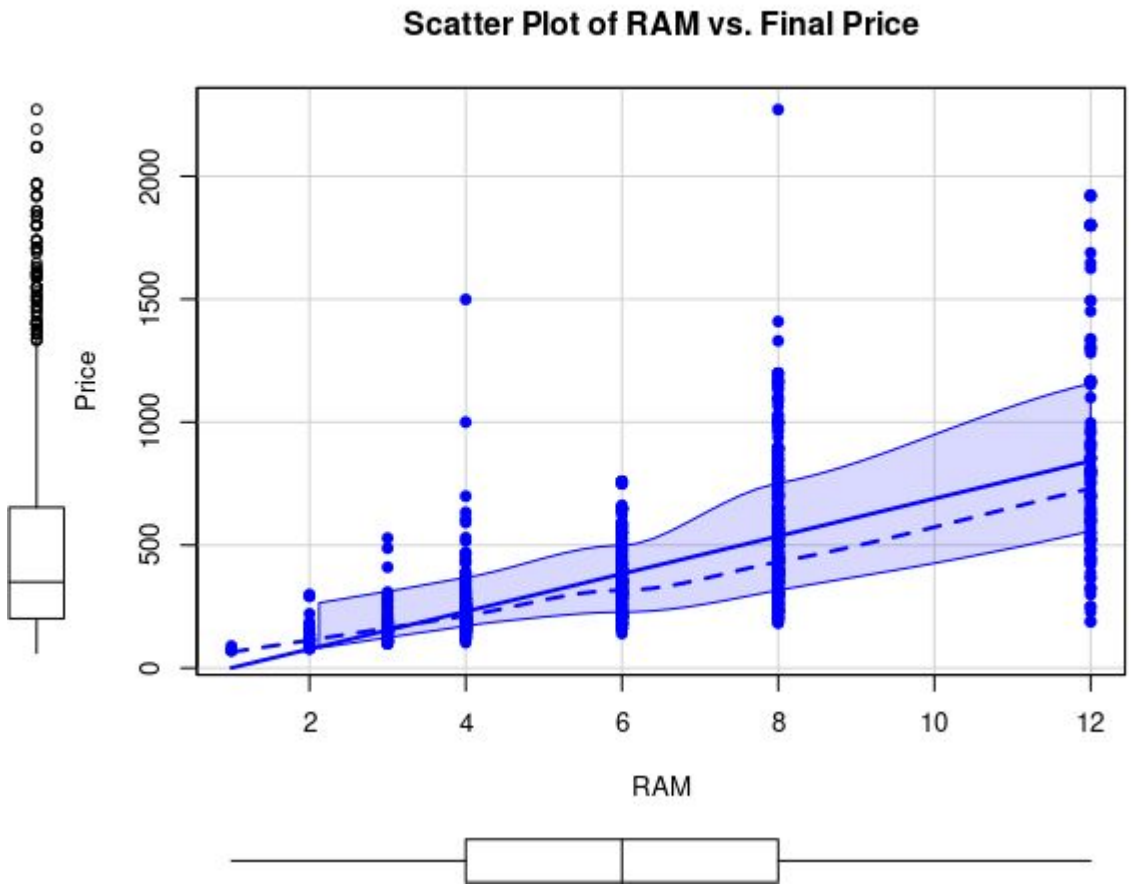


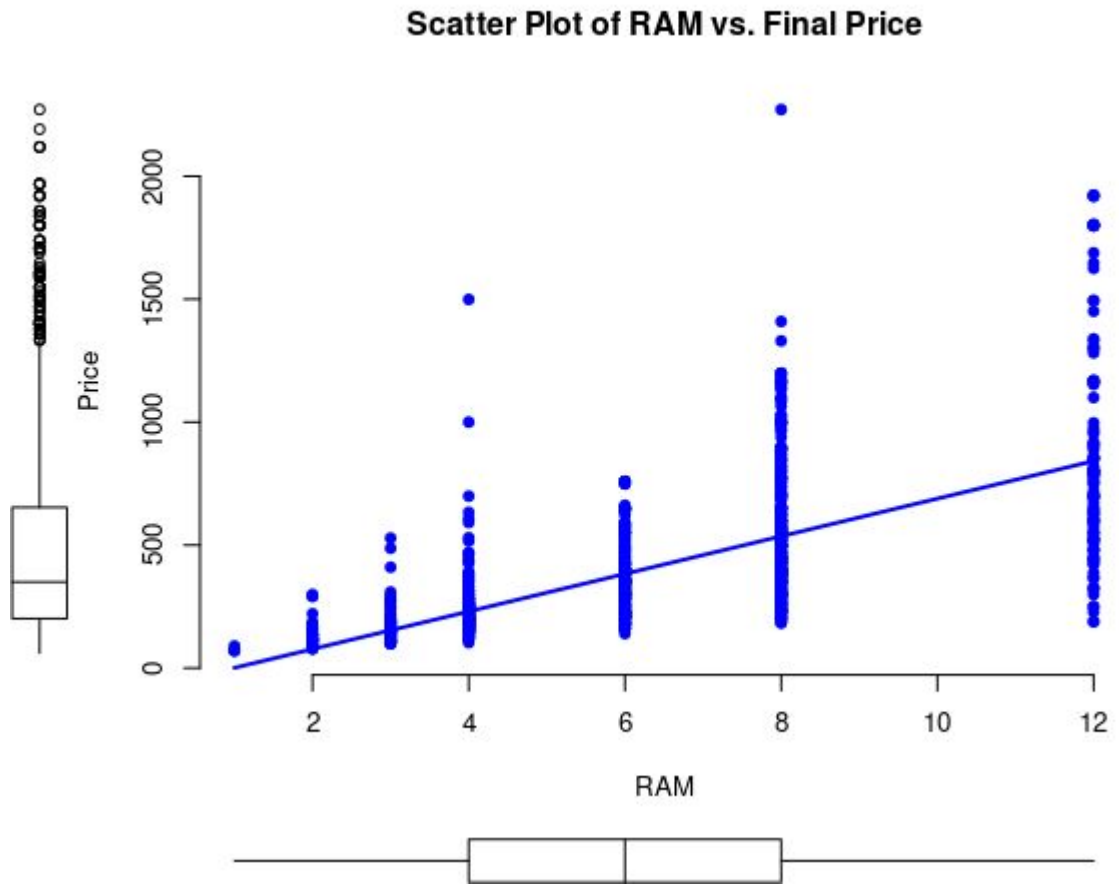

```
plot(data$Final.Price ~ data$RAM)
```






```
plot(data$Final.Price ~ data$RAM, col="blue", pch=1,
     xlab="RAM", ylab="Frice",
     main="Scatter Plot of the cost of the smartphone vs its RAM")
abline(lm(data$Final.Price~data$RAM), col="red", lwd=2)
```



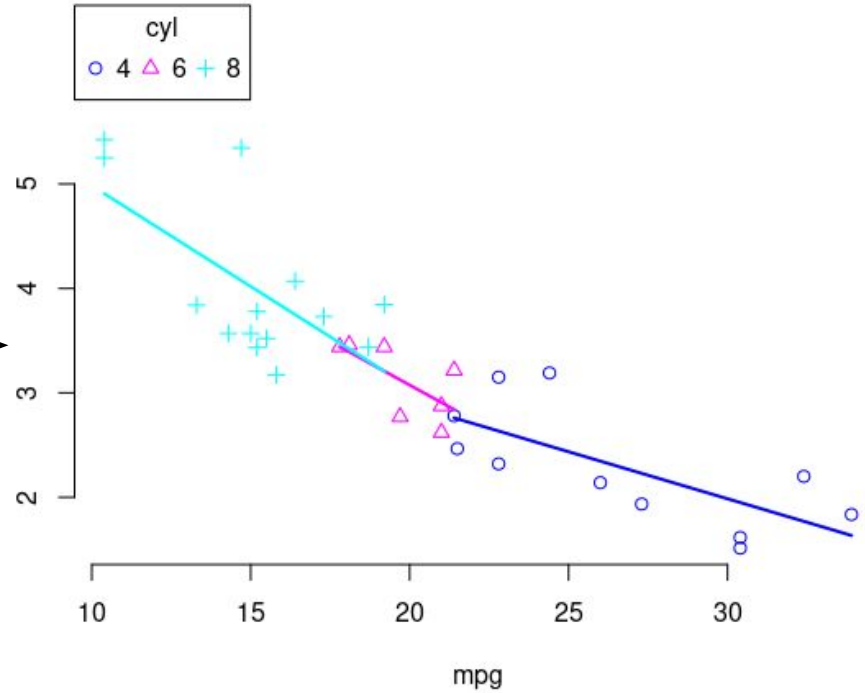


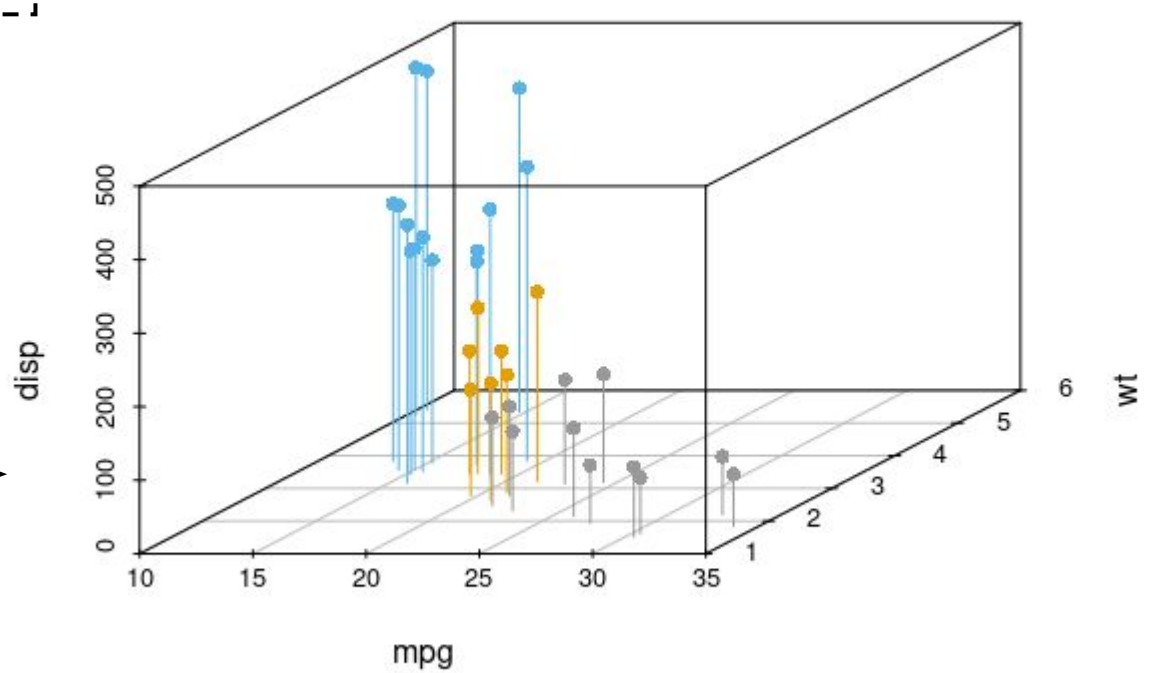

```
install.packages("car")
library(car)
scatterplot(Final.Price ~ RAM, data=data,
            col="blue", pch=19,
            xlab="RAM", ylab="Price",
            main="Scatter Plot of RAM vs. Final Price")
```

```
scatterplot(Final.Price ~ RAM, data=data,
            smooth=F, grid=F, frame=F,
            col="blue", pch=19,
            xlab="RAM", ylab="Price",
            main="Scatter Plot of RAM vs. Final Price")
```

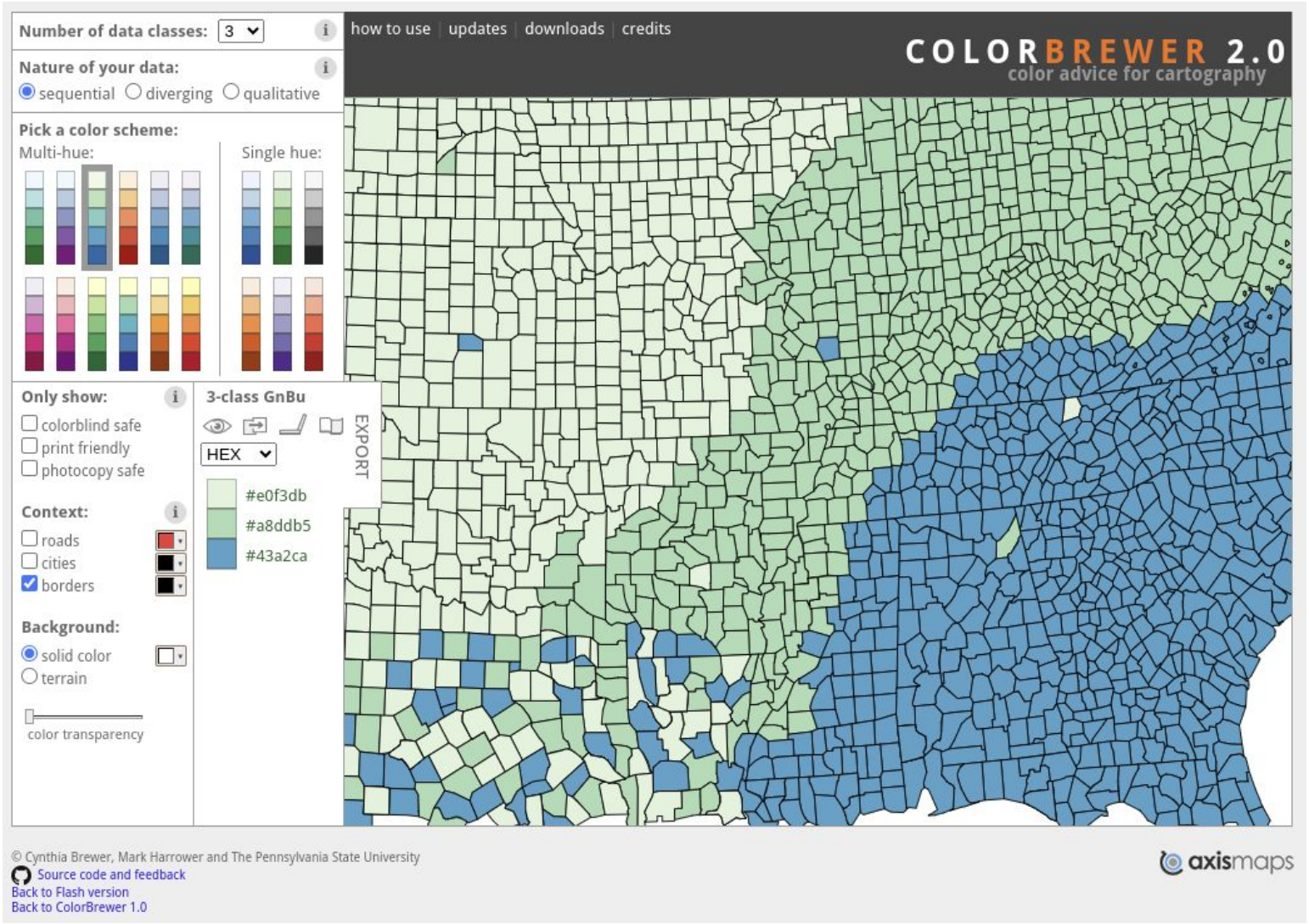
Scatterplot with new dataset

```
> dt <- mtcars
> dim(mtcars)
[1] 32 11
> head(mtcars)
                   mpg cyl disp  hp drat    wt  qsec vs am gear carb
Mazda RX4         21.0   6  160 110 3.90 2.620 16.46  0  1    4    4
Mazda RX4 Wag     21.0   6  160 110 3.90 2.875 17.02  0  1    4    4
Datsun 710        22.8   4  108  93 3.85 2.320 18.61  1  1    4    1
Hornet 4 Drive    21.4   6  258 110 3.08 3.215 19.44  1  0    3    1
Hornet Sportabout 18.7   8  360 175 3.15 3.440 17.02  0  0    3    2
Valiant           18.1   6  225 105 2.76 3.460 20.22  1  0    3    1
> scatterplot(wt ~ mpg | cyl, data=dt,
+              smooth=F, grid=F, frame=F)
> ### Scatter plot 3D
> library("scatterplot3d")
> gr=as.factor(dt$cyl)
> colors <- c("#999999", "#E69F00", "#56B4E9")
> scatterplot3d(dt$mpg, dt$wt, dt$disp,
+               grid=T, box=T, pch=16, color=colors[gr], type="h",
+               xlab="mpg", ylab="wt", zlab="disp")
>
```





Color palette: ColorBrewer



https://colorbrewer2.org/#type=sequential&scheme=BuGn&n=3

Thank you for your attention!