



DATA VISUALIZATION IN R



BASE GRAPHICS

“graphics” package

The package used for Base Graphics in R is “graphics”

hist(), boxplot()	Univariate Analysis
plot()	Bivariate Analysis
mfrow()	Arrange n plots in a single plot
par()	Set Graphical parameters

Univariate Analysis

boxplot()	To study distribution of a continuous variable
hist()	Frequency distribution of a continuous variable
lines()	Joining points with line segments
abline()	Drawing straight lines

Bivariate Analysis: plot()

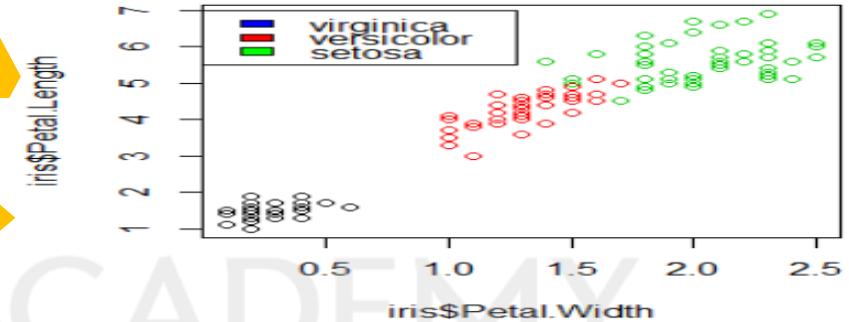
The plot function can be used for plotting

- Numeric variables
- Character and factor variables
- Scatter plots
- Entire dataset

Legends

legend(): controls the position of legends

```
> plot(x=iris$Petal.Width, y=iris$Petal.Length, col=as.numeric(iris$Species))  
> legend(0, 7, c("virginica", "versicolor", "setosa"), c("blue", "red", "green"))
```



Graphical Parameters

par('mar')	5.1 4.1 4.1 2.1	Default plotting margin in Rstudio
par(mar=c(1,1,1,1))	1 1 1 1	Rescaling the margin in Rstudio
par(mfrow=c(2,2))	4 plots	Arranging plots in 2 rows and 2 columns, row-wise
Par(mfcol=c(2,2))	4 plots	Arranging plots in 2 rows and 2 columns, column-wise



VISUALIZATION USING ggplot2

1

Base Graphics vs ggplot2

Base graphics	Good for simple tasks,difficult syntax
ggplot2	Simple syntax, interfaces with other packages

2

Grammar of Graphics

A plot composed of Aesthetic Mapping, Geoms, Statistical Transformations, Coordinate Systems and Scales

Components	Description
Aesthetic Mapping	What component of data appears on X axis, Y axis, how is the color, size, fill and position of elements is related with the data
Geoms (Geometrical Objects)	What geometrical objects appear on the plot: points, lines, polygons, area, boxplot, rectangle, tile etc
Statistical Transformations	Compute density, counts, (Histogram: Need to bin and count data)
Scales and Coordinate System	Discreet scale or Continous. Cartesian or Spherical.

5

Geoms with default stat and aesthetic

Geom	Default Stat	Default Aesthetics
geom_point	"identity"	colour,fill,shape,size, x,y
geom_histogram	"bin"	colour,fill,linetype,size,weight, x
geom_density	"density"	colour,fill,linetype,size,weight, x,y
geom_polygon	"identity"	colour,fill,linetype,size, x,y
geom_line	"identity"	colour, linetype, size, x, y
geom_tile	"identity"	colour, fill, linetype, size, x, y
geom_boxplot	"boxplot"	colour, fill, lower, middle, size, upper, weight, x ,ymax, ymin

6

Note: Items in bold are required, others are optional and have default values or are computed by a default stat transform

8

Univariate Analysis

geom_boxplot()	To study distribution of a continuous variable
geom_histogram()	Frequency distribution of a continuous variable
geom_density()	Density plots



VISUALIZATION USING ggplot/ggmap

1

Bivariate Analysis

geom_point()	Scatter plot
geom_bin2d()	Bivariate counts
facet_grid()	Forms a matrix of panels defined by row and column facetting variables

2

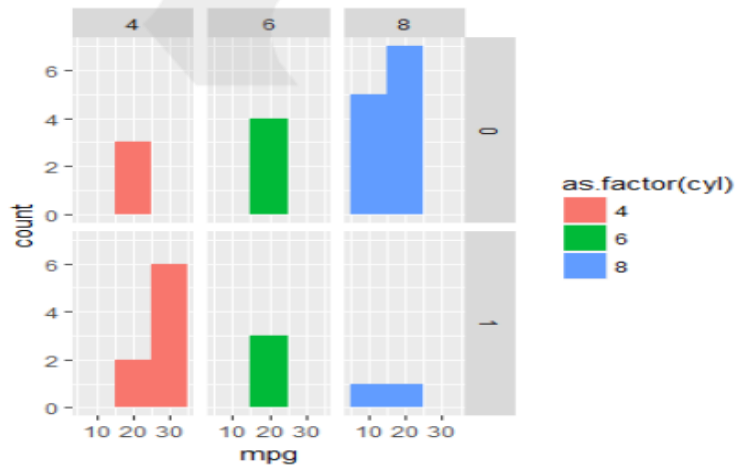
Facet Grid

Most useful when you have two discrete variables

```
> library(ggplot2)
> p=ggplot(mtcars, aes(x = mpg))
> plot=p+geom_histogram(aes(fill = as.factor(cyl)),binwidth = 10,position = "dodge")
> plot+facet_grid(am~cyl)
```

3

4



5

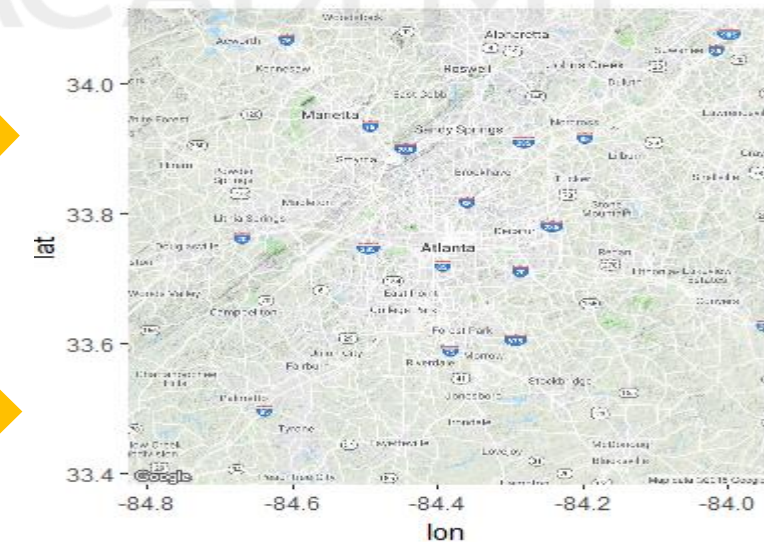
Maps in R

get_map()	A ggmap object
ggmap()	Plots the object produced by get_map()
ggsave()	saving a plot

```
> library(ggmap)
> map <- get_map("Atlanta", zoom=10)
Map from URL : http://maps.googleapis.com/maps/api/staticmap?center=Atlanta&zoom=10&size=640x640&scale=2&maptype=terrain&language=en-EN&sensor=false
Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=Atlanta&sensor=false
> p <- ggmap(map)
> ggsave(p, file = "map7.png", width = 5, height = 5, type = "cairo-png")
```

7

8



CHEATSHEET TEMPLATE

1

Lorem Ipsum

Lorem ipsum dolor sit amet, nibh est.

5

Lorem Ipsum

Lorem ipsum dolor sit amet, nibh est.

2

Lorem Ipsum

Lorem ipsum dolor sit amet, nibh est.

6

Lorem Ipsum

Lorem ipsum dolor sit amet, nibh est.

3

Lorem Ipsum

Lorem ipsum dolor sit amet, nibh est.

7

Lorem Ipsum

Lorem ipsum dolor sit amet, nibh est.

4

Lorem Ipsum

Lorem ipsum dolor sit amet, nibh est.

8

Lorem Ipsum

Lorem ipsum dolor sit amet, nibh est.

