Παράδειγμα με δεδομένα V-Dem v.14

```
#install packages
install.packages("tidyverse")

#Packages to use for our analysis
library(tidyverse)

#Generate new variable (change scale)
Vdem14$libdem <- (Vdem14$v2x_libdem)*100

hist(Vdem14$libdem) #frequencies (συχνότητες)
summary(Vdem14$libdem)  #Variable summary
```

Logical operators in R

Operator	Description
+	addition
-	subtraction
*	multiplication
/	division
^ or **	exponentiation

Operator	Description
<	less than
<=	less than or equal to
>	greater than
>=	greater than or equal to
==	exactly equal to
!=	not equal to

```
#Create new variable (nominal)
Vdem14$libdemf[Vdem14$libdem<34] <- "Autocracies"
Vdem14$libdemf[Vdem14$libdem>33 & Vdem14$libdem <=66] <- "Hybrid"
Vdem14$libdemf[Vdem14$libdem>66] <- "Democracies "

libdemftable<- table(Vdem14$libdemf) #create table
libdemftable #print table
barplot(libdemftable) #visualize

#Selecting observations with "subset”
y2018 <- subset(Vdem14, year==2018)
libdemftable2018<- table(y2018$libdemf) #create table
libdemftable2018 #print table
barplot(libdemftable2018) #visualize

#Selecting observations with brackets [ ]
libdemftable2018 <- table(Vdem14$libdemf[Vdem14$year==2018])
libdemftable2018 #print table
barplot(libdemftable2018) #visualize
```

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```
#Line graph (two variables)
ggplot(subset(Vdem14, country_name=="Greece"), aes(x=year, y=libdem)) +
        geom_line(size=1, colour="blue") +
        ylab("Liberal Democracy (0-100)") +
        xlab("Year")

#Line graph for multiple categories or groups
#τα σύμβολα %>% είναι ένα pipe operator και λειτουργεί ως σύνδεσμος εντολών
southeuro <- data.frame(Vdem14) %>%
filter(country_name %in% c("Greece", "Spain", "Italy", "Portugal"))

southeuro %>%
ggplot( aes(x=year, y=libdem, group=country_name, color=country_name)) +
        geom_line(size=1) +
        ylab("Liberal Democracy (0-100)") +
        xlab("Year")

#Separate into different graphs (command "facet_wrap“)
southeuro %>%
ggplot( aes(x=year, y=libdem, group=country_name, color=country_name)) +
geom_line(size=1) +
 ylab("Liberal Democracy (0-100)") +
xlab("Year") + facet_wrap(~ country_name)
```

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Εξερεύνηση μεταβλητών με γραφικές απεικονίσεις

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```
#explore other variables
summary(Vdem14$e_gdppc)
hist(Vdem14$e_gdppc)

hist(log(Vdem14$e_gdppc))  #logarithmic transformation

#explore variables for subset of dataframe
hist(Vdem14$e_gdppc[Vdem14$year==2018])
hist(Vdem14$libdem[Vdem14$year==2018])
#transform old variable into new variable
Vdem14$loggdppc <- log(Vdem14$e_gdppc)
hist(Vdem14$loggdppc[Vdem14$year==2018])
```

Παράδειγμα με δεδομένα V-Dem v.14

```
#create scatterplot (base R)
plot(x=y2018$e_gdppc, y=y2018$libdem)

#πακέτο που μας επιτρέπει να προσθέσουμε στατιστικά τεστ στο ggplot
install.packages("smplot2")
library(smplot2)

#Scatterplot  (gdp per capita and libdem) using ggplot with regression fit line
and 95% confidence intervals

ggplot(subset(Vdem14, Vdem14$year==2018), aes(x=e_gdppc, y=libdem)) +
        geom_point(color="blue", size=2, shape=1) +
        geom_smooth(method=lm) +
        sm_statCorr() +
        ylab("Liberal Democracy (0-100)") +
        xlab("GDP per capita")

#with log transformation of GDP per capita

ggplot(subset(Vdem14, Vdem14$year==2018), aes(x=loggdppc, y=libdem)) +
        geom_point(color="blue", size=2, shape=1) +
        geom_smooth(method=lm) +
        sm_statCorr() +  ylab("Liberal Democracy (0-100)") +
        xlab("GDP per capita(log)")
```