Exercise set 1. Introduction to R

Data Visualization and Modelling

in Master in Modelling for Sciences and Engineering, UAB. September 2022.

1.0 The exercices 1.1–1.4 should be included in a single script:

(a) Create and save a new script file with your name "yourname-1.R". As a comment, inside the script, write your name and your NIU.

(b) Set the working directory to the location of your script.

(c) Display the list of objects in your workspace.

Central England precipitation (mm).

1.1 The following data are on Central England precipitation in mm per m^2 in July from 2012–2022, in million mm per m^2.

year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
precip	99.30	48	51	74.90	35.10	80.90	26.60	66.20	63	70.10	14.70

1. Enter the data into R, as two vectors. To save keystrokes, enter the successive years using ":".
2. Calculate the mean of `precip`
3. Create a new vector called `anomaly` equal to `precip` minus its mean.
4. Plot `precip` versus `year`.
5. Create a summary of the variable `precip`.

Create a vector x with a sample of 200 numbers from 1 to 10:

```
set.seed(YourNiuNumber)  # your own NIU
x<-sample(1:6,100,replace=TRUE)
```

1. Count the number of 7's in x.
2. What is the value of the 131th component of x?
3. Display the components of x corresponding to even positions from 22 to 40th (that is 22th,24th,..., 40th) using `seq`.
4. Modify x so that 7's are changed into 50.
5. Create a vector z with the components of x that are greater than 85.
6. Calculate the mean of the square root of x.
7. Concatenate z and x in a new vector called `zx`.
8. Remove `zx` from your workplace.

Without looping produce the two character vectors

```
"x1" "y1" "z1" "x2" "y2" "z2" "x3" "y3" "z3" "x4" "y4" "z4"
"x1" "x2" "x3" "x4" "y1" "y2" "y3" "y4" "z1" "z2" "z3" "z4"
```

Read the data file `rincome.txt` about reported incomes that you will find in Moodle. Create a character vector `rincome` using

```
rincome<-scan("rincome.txt",character(),sep="\n",skipNul = T)
```

1. Convert the values `"Don't know"` `"No answer"` `"Not applicable"` `"Refused"` into `NA`. You can use the command `%in%`
2. Create a factor `rincome.f` with the values of `rincome` into a factor and display its levels.
3. Create a new vector `rincome.lv` with the levels of `rincome.f`.
4. Reorder `rincome.lv` so that `"Lt $1000"` is the first
5. Create an ordered factor `rincome.o` with `rincome.f` and the order of levels given by `rincome.lv`.
6. With `summary(rincome.o)` see the result of the previous manipulation.
7. Apply the function `class` to all the objects in this exercice to see the differences.