# SMDE First assignement (20% of the final mark, individual)

## First question: generate a random sample (15% of the FIRST ASSIGMENT).

On this exercise, we are going to start working with probability distributions. The first work to do is to **generate more than 200 observation**s of a uniform distribution (RNG). We are going to generate this using code (Java C++, …).

To do so you can access to: <http://wiki.fib.upc.es/sim/index.php/Main_Page/en>

Explore the different alternatives that exists and select one to perform the codification of your RNG. The program must write the output in a text file that are suitable to be imported to R.

**Test the fitting** of the values with a new sample now generated by R (or a Spreadsheet like Excel). Use for the fitting a Chi-square test.

Is the sample generated by the RNG similar to the one generated on R (or in the Spreadsheet)? You can play with the distribution, changing the parameters.

Are you really comparing the quality of the RNG or the RVA?

Justify your answers.

### Some useful remarks:

Here you can find some useful tools and resources to solve this question.

**Some code**

#generation of a normal distribution.

v1=rnorm(200, mean=0, sd=1)

summary(v1)

#Work with the data as a dataframe.

taula\_v1=data.frame(x1=v1)

#Definition of the intervals, categories to be used.

taula\_v1\_cat=transform(taula\_v1, cat = ifelse(x1 < -1,"-1",

ifelse(x1 < -0.5,"-0.5",

ifelse(x1 < 0,"0",

ifelse(x1 < 0.5,"0.5",

ifelse(x1 <1,"1","Inf"))))))

#Counting the amount of elements in each category “table” function.

taula\_freq\_v1=as.data.frame(with(taula\_v1\_cat, table(cat)))

The code for the Chisquare (remember that we need to **create the taula\_freq** with two columns, the occurrences for each category on the both distributions).

Test=chisq.test(taula\_freq, correct=FALSE)

Also, remember, to generate the data in an Spreadsheet, we need to copy the samples to use in a column that is not going to change.

