

Exercise I

- 1 Define a function that transform Celsius to Fahrenheit
 - Given the function defined before think on using an argument to compute the inverse (Fahrenheit to Celsius)
- 2 Define a function that given a number it computes the Fibonacci series
What can happen if a float number or a negative number is given?
- 3 Define a function that given a number it checks if it is a prime number
- 4 Two integer number are “friends” if the quotient between the number itself and the sum of the divisors are equal. For example the sum of divisors of 6 is $1 + 2 + 3 + 6 = 12$. The sum of divisors of 28 is $1 + 2 + 4 + 7 + 14 + 28 = 56$. Then $12 / 6 = 56 / 28 = 2$, thus 6 and 28 are “friends”.
Define a function that given 2 number as input checks if the numbers are “friends”.
- 5 Fix the number of samples to 1000 and extract at least 8 $\mathcal{N}(m, 1)$ where $m \in [-3, 3]$.
 - With the same number of samples extract at least 8 $\mathcal{N}(0, s)$ where $s \in [0.1, 2]$.
 - Plot the results in a same window with 3 different plot, one for $\mathcal{N}(m, 1)$, one for $\mathcal{N}(0, s)$ and one for $\mathcal{N}(m, 1)$ and $\mathcal{N}(0, s)$ together. Decide the color code for each linesuggestion: search for “R color charts” in google and the function `colors()` in R
 - Plot the different distribution on the sample plot

Exercise II

- 6 Extract from a normal distribution an increasing number of samples (10-10000) and look at the differences in the distribution between sample sizes
- 7 The dataset `Pima.tr` collects samples from the US National Institute of Diabetes and Digestive and Kidney Disease. It includes 200 women of Pima Indian heritage living near Phoenix, Arizona.
 - Get the dataset from the MASS package or download it from the website.
 - Describe the dataset, how many variables, which type of variable, how many samples ...
 - What do the variables mean?
 - Get the frequencies of the women affected by diabetes.
 - Explore the dataset using histograms, barplots and plots. For each plot you do describe what you see and why did you do that plot.
 - Using categorical variable `type` to see if there is any difference in age distribution, `bmi`, and `glu` variables