**Basic commands in Python**

In this section, we will learn the most basic commands in python. Not aiming to teach you programming, but to be able to recognize the syntax and meaning in the following notebooks. We are providing you with links to more detailed tutorials and references.

**First things first. Basic operations.**

Those are very similar to all programming languages, but note the exponential, that is two \*\*.

Let’s define two integer variables, let’s do some basic operation and print the result.

An operation over the same variable can be simplified by adding the operator in front of the =. Try the following commands, and note how x and y changes.

**Loops**

Although avoiding loops is a goal in scientific (and any large data) coding, sometimes is necessary to use them.

Python can iterate over any list. Meaning, that we need to make a list in order to pass it (or iterate it) with a for loop.

Here is an example. Define a list, and then for an item (and you can name this whatever you want) in your list, do:

Note the indentation after the for line. This indentation indicates to python that the indented instructions are part of the for loop. once we don’t have the indentation, is out of the loop. without the need of an end. This makes python a positional programing language.

Try the executing the code below. How many times is the list printed?

Range function

While iterating over the elements of a list is a very useful characteristic of python, sometimes we want to iterate over a series of numbers- maybe indices. For that we use the function range(). Which arguments are: the start, the non-inclusive end (therefore the range will not stop before that number, and the increament. All integer numbers.

Lets give it a try. First execute the code below as it is.

Now, change the ‘somelist’ in the foor loop with range(0,41,5). Execute again.

Now try changing the start, end or step and execute again.

Now try only range(10). What’s the difference? What’s the default start and step?

Sometimes we need not only the value in our list, but also the index. Specially if the list is not a continuous series. For that, we can use the function enumerate(). And note that in the for loop we have the index, and the value of our list.

Note also the printing function format, which feeds values to both {} tokes in the printing string.

Also note an important thing to know… and remember about python: that the initial index is Zero.

**Conditionals**

Conditionals are used to compare variables or to test logical statements. Sometimes both. Or sometimes is the same thing.

For numerical values, the syntax is: ==, !=, <, > >=. <-

For logical operations: and, or, not

There are string operations, but we’re not going to work with those in here. See the python tutorials for that.

The way to use conditionals are exemplified in the next code:

Conditions are if, elseif or else. Note the colon and indentation, the same as for for loops.

Execute the code, and then test different values and different operators. Both, numerical and logical.