First steps in Python (Python3)

In this work, we will get used to variable manipulation and to the syntax of Python3. First open the Python3 command line. In this environment, the symbol >>> is a "prompt" that waits for an instruction. To execute an instruction, just press "Enter".

1   Basic types and operators

Python3 types a variable when it receives a value. It is a *dynamic type checking*. Type the various instructions in this section, look carefully what happens and **take notes** (the use of a pen is not forbidden when interacting with a computer).

1. >>> a=3
   >>> type(a)

2. >>> b=5.3
   >>> type(b)

3. >>> c="Hello"
   >>> c
   >>> print(c)
   >>> type(c)

4. >>> d=(a>1)
   >>> d
   >>> type(d)

5. >>> e=6/3
   >>> e
   >>> type(e)

6. >>> f=6//3
   >>> f
   >>> type(f)

7. >>> g=a+b
   >>> type(g)
   >>> g

8. >>> h=a+f
   >>> type(h)
   >>> h

9. >>> i="3.14"
   >>> type(i)
   >>> j=float(i)
   >>> type(j)
   >>> k=i+j

10. >>> l=str(a)
    >>> m=str(f)
    >>> print(a,l,f,m,sep="***")
    >>> print("a+f = ",a+f," and l+m = ",l+m)

11. >>> text="Hello \n how are you?"
    >>> text
    >>> print(text)
    >>> print(text,"text")

12. >>> name=input("Enter your name: ")
    type your name
    >>> print("your name is: ", name)

13. >>> n=input("Enter a number: ")
    type any number
    >>> p=n+7

14. >>> q=float(input("Enter an integer: "))
    type any integer
    >>> q

15. >>> r=int(input("Enter an integer: "))
    type any integer
    >>> r

16. >>> s=int(input("Enter Pi with 2 decimals: "))
    type 3.14

17. >>> t=8
    >>> u="Thing"
    >>> P=(t<=10)
    >>> Q=(u=="thing")
    >>> R=(u<"thing")
    >>> P
    >>> Q
    >>> R
    >>> P and Q
    >>> P or Q
    >>> P or R
    >>> not R
    >>> P or (not R)
    >>> P and (not R)
    >>> (not P) and Q
    >>> not(P and Q)

18. >>> v=37
    >>> w=7
    >>> quotient=v//w
    >>> remainder=v%w
    >>> print(v,"=",w,"x",quotient,"+",remainder)

2   Useful functions

For the following instructions, you need to type first:
    >>> from math import *
    Try to predict what will happen before your press "Enter" (use your pocket calculator if needed)... and take notes!

1. >>> x= 2.718
   >>> round(x,2)
   >>> round(x**3,1)
   >>> abs(1-x)
   >>> floor(x)
   >>> floor(1-x)
   >>> floor(abs(1-x))

2. >>> round(exp(2),3)
   >>> round(log(2),2)
   >>> round(sqrt(2),3)

3. >>> chr(75)
   >>> ord("x")

4. >>> text="Here is Henri"
   >>> float(text)
   >>> len(text)
   >>> text[6]
   >>> text[7:8]
   >>> text[4:]
   >>> text[:3]
   >>> text[-3:]
   >>> "i" in text
   >>> "h" in text
   >>> text + " your fellow"
   >>> text + 1789

3   A (first) program

Convert the following algorithm into a Python3 program, and save it into a .py file:

Algorithm "Double a number".

Variables:
A is a real number.

Instructions of the algorithm:
1    $A \leftarrow$ Input("Enter a number: ")
2   Print("Your number multiplied by 2 is ", $2 \times A$)