Python Course

Class 1 : Programming basics

Presented by : Sofiane MEDJKOUNE
Email : sofiane.medjkoune@protonmail.com

What's a programming language ?

- *A **programming language** is a special language programmers use to develop software programs for computers to execute.*
- *A Software program is a set of instructions that the computer can read and understand (After few transformations of course).*
- *There are many programming languages, some of them are compiled and interpreted languages (further informations at : https://www.lifewire.com/compiled-language-2184210), some of them are :*
    - ***Compiled :** C, C++, Java, Pascal...etc.*
    - ***Interpreted :** Perl, PHP, **Python**...etc.*
- *Choosing a language to use depends on your need, for example to develop a web app you can use PHP, to create an android application you can choose java, to manage critical system applications you can choose C...et*
- *In this course we'll be choosing **PYTHON,** it's one of the most used languages in 2018 because of its portability, ease to learn and use, rich documentation and great community. (More informations at : http://www.bestprogramminglanguagefor.me/why-learn-python)*

Note : For the rest of this course, all the programming concepts will be explained following the python syntax and logic

Variables

- A variable is simply a storage space in our memory that contains an **information.** Informations must be stored somewhere, and that somewhere is our variable so that we can use this information in our code, read it, update it, remove it...etc
- Variables are represented by their **identifier** (symbolic name) this name must follow the following conventions : https://docs.snowflake.net/manuals/sql-reference/identifiers-syntax.html .
- In addition to the identifier, a variable has a **type** and a **value**. The most common types are : (more informations at : https://www.tutorialspoint.com/python/python_variable_types.htm)
  - ***int*** : integer: a whole number, ex : ***1, -5, 0, 132482, -3213 ...etc***
  - **float** : floating point value: ie a number with a fractional part. ***ex : 1.0, 3232.4, -3.5 ...etc***
  - **char-strings** : a single character - multiple characters put together ***ex : 'A', 'D' - "Welcome to Open Minds Club !", do not forget the " " for the characters and strings !***
  - ***booleans*** : whether a statement is true or false ***ex : True, False .***
- In python there's no need to declare the variable type, we just assign the value to the variable
  -

Variable operations

- ***Affectation*** : my_fisrt_variable = 1
- ***Multiple affectation*** : my_first_variable, any_other_variable = 2.5, “Yes affecting a string now”
- ***Arithmetic operations*** : a = b + c, a = b - c (basic arithmetic operators are : +, -, *, /, %)
- ***incrementation*** : a = a + 1 can be written as : a+=1 , The general form is : variable = variable (arithmetic operator) (value or variable) ===> variable(arithmetic operator)=(value or variable) for example : a = a - b ===> a-=b
- ***Boolean affectation*** : my_crazy_variable_name = True
- **Boolean Expressions** : Boolean operations are based on comparators (>, <, >=, <=, ==, is, !=, not, and, &&, or, ||) for example we can have :

a, b = 2, 10

my_crazy_variable_name = (a > b) ***(this operation will give the Boolean value : False to my variable)***

my_crazy_variable_name = (a <= b) (this operation will give the Boolean value : True to my variable)

Conditions

- In programming conditions are one of the most important structures, it tells the program whether to choose between option 1, option 2, option 3… depending on a condition, *for example : if i do this course the good way ===> i'll get a certificate, if i don't ===> i'm not getting the certificate* .
- In python conditions follow the syntaxe :

```
if BOOLEAN EXPRESSION:
        STATEMENTS
elif BOOLEAN EXPRESSION:
        STATEMENTS
else:
        STATEMENTS
```

- ***Important rules :***
  - DON'T FORGET THE INDENTATION, in python if a statement belongs to a condition, loop, function, exception or any other structure we need to put a tab under the structure.
  - Don't forget the : (two points) after Boolean expression or the else statement.

Loops

- Loops provide us from re-writing the same instruction multiple times.
- Loops help us parse through structures(We'll see that in the following course) in a simple and fast way.
- The most used ones are the **For** and **While** loops.
    - **While :** is used mostly when we do not know how many times we have to repeat an operation and is written :

while BOOLEAN EXPRESSION :

SET OF INSTRUCTIONS

Example :

```
my_age = 17
while my_age < 18 :
    can't go to a dance club
    if birthday :
        my_age += 1
```

Important : don't forget the indentation as mentioned previously and don't forget the 2 points ":" after the Boolean expression

Loops

- The **for** loops can be used literally everywhere and is the most used one. In general we use the **for** loop when we know how many times we have to repeat a certain instruction, for example if we want to print the multiplication table for 6, **i know** i have to print a certain results 10 times : 6x1 = 6, 6x2 = 12...etc
- In addition the **for** loop is used to parse over structures, for example if we need to read a file that contains hundreds of words we can use the **for** loop to get these words (We'll see that in an upcoming course).

Examples :

```
for i in range (1,11) :
    print (" 6 x",i," = ", 6*i)

for character in "print each character alone" :
    print (character)
```

New instructions

- ***print()*** : used to print a text, or the content of a variable to the console

  print(“Hello this is my first print and i wanna print the content of the variable”,my_agee)

- ***input()*** : gives the hand to the user to input a value, generally used this way :

  my_variable = input()

- ***in*** : is a key word generally used in BOOLEAN EXPRESSION to say that the values of our variable will be **in** a certain range of values (as we have seen in the previous slide)

Practice !

Write a program that asks the user a mathematical question, and he has to answer ,if the answer is correct, we congratulate him, if the answer is not correct, he has to write the sentence : I suck at math, i need more practice. he has to write it a 1000 times !!!!