CyberCamp at UNK

Definitions, indentation, functions and Hello World!

What you will learn with this tutorial...

In this tutorial you will learn some basic concepts of ***programming languages*** *(first of all, what is a programming language anyway?) and more specifically about* ***Python****, you also will understand what* ***indentation*** *means and why this is important in the Python world, as well as what is a* ***function****. After all that you will write your first Python program! Let's get started!*

1 Definitions

In a very simple way we can state that a programming language is a coded language created by programmers that is used to write instructions that a computer can understand. You can think of it like the idiom that the machines can understand. Through programming languages we can create sets of well-defined instructions called **algorithms**, which control the behavior of the computers as we want.

Python is one example of programming language. It was created on 1991 by a Dutch guy named Guido van Rossum and it is widely used nowadays. It is a language easy to learn and its codes are easy to read, just like you will start learning in a few moments.

2 Indentation

In the world of the programming languages, indentation is a term applied to the code of a program to highlight or define the structure of your algorithm. This way your code gets easier to read and understand. In some languages indentation is optional, but in Python it is mandatory, this is the reason why the first thing we will learn in Python is how to properly indent codes.

Computer programs are structured by what we call **blocks**. Blocks are groups of statements (instructions) in our codes. In Python, code blocks are defined by indentation. This means that all the statements with the same distance to the left of the page belong to the same block of code.

Some conventions are used when you want to indent your code. In Python, the first block of code will always start at the left most side of the page, no spaces from the margin are required. When adding a block, the convention is to either type four spaces or tab, so you can start writing the statements for your next block.

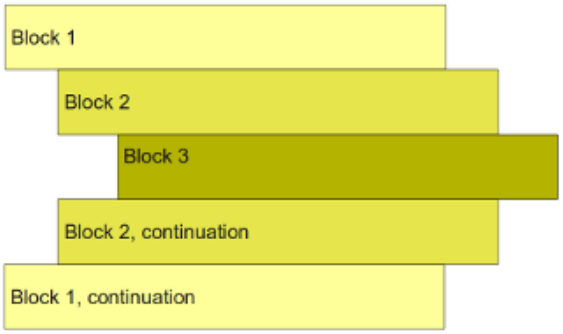

Figure 1: Example of blocks structure.

3 Functions

Another important concept to learn right at the beginning is what a function is. We can define **functions** as a bunch of sub-steps that allows us to reuse our code instead of rewriting it every time we need it. Don't worry about it too much right now, just keep in mind functions are used to help organize our code and keep it neat. Usually programs start with a function called **`main()`**.

To define a function in Python we use the command **`def`**, followed by the name of our function with parenthesis and a colon, like this:

```
1    def main():
2        # code of the second block, remember indentation!
```

Note that we wrote a line above starting with #? This is a *comment line*, our computer will not process it, it is only for us humans understand what is going on. Now that you learnt what it is and how to define a function we will code our first Python program.

4 Hello World!

After learning a little about the theory we will start the practice! In the programming world, whenever a programmer starts learning a new language, he or she codes a program that when executed by the computer says: **Hello World!** This is used as a test or a simple example of a code execution in that language. We are going to code our hello world program in Python right now.

In order to do so we have to learn a new command in Python. The command we will use is called print. This command is responsible for printing in the screen whatever information we put in front of it. This information can be a word, a phrase or the value of a variable, for example (don't worry, we will learn what a variable is later!). In our case, we want that print writes **Hello World!** in our screen.

First of all we should define our function **`main`**, like we discussed before. In your text editor type:

```
1  def main():
```

Now that we have our function created, in the next line we will put our print command with our sentence:

```
1  def main():
2      print "Hello World!"
```

If you want to type a word or phrase, just like what we are trying to do now, remember you must put your message inside double quotes (“”). This is how Python understand what we want to display in our screen.

Note that we have *tab* before our `print` command, since we are starting a new block after creating our function, it is mandatory to apply either spaces or tab, otherwise Python will return us an error.

Last thing to do is to call our function. So far we created it, but now we need to tell Python to execute it. To do so, in the third line simple type the name of the function followed by parenthesis. Your full code should be like this:

```
1  def main():
2      print "Hello World!"
3  main()
```

Now simple execute your code. You should get something like this:

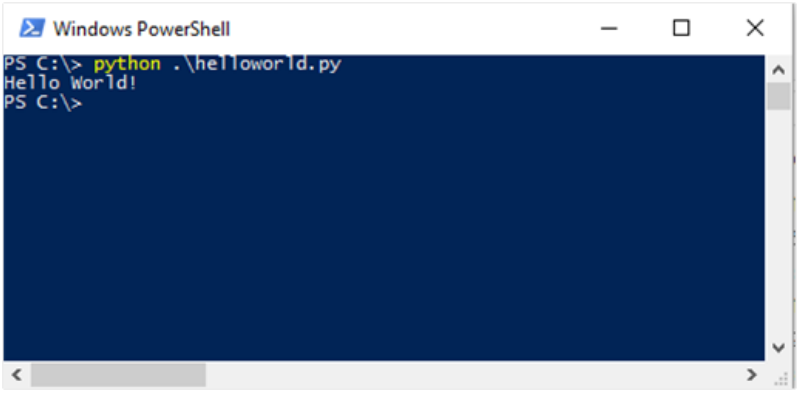

Figure 2: Hello World in Python.

Now try for yourself!

Why don't you try to code a few more lines? Below your ***"Hello World!"*** *code three more text lines with words or phrases that you want. It can be your name, favorite sport, sentence of a song that you like, anything. Just remember that your word or phrase must be inside double quotes (""), otherwise Python will not understand and will return an error, and also remember that it should be properly indented. All the print lines should be part of the same block, so all of them should be in the same distance from the left side of your file. Good luck!*