Introduction to Python - Python I
1 Getting Started

This is a short recap what you have learned the previous days.

1.1 Connecting to UPPMAX

Open a terminal and start a ssh connection to UPPMAX as you learned on Monday.

$ ssh -X <username>@tintin.uppmax.uu.se

Note: <username> is replaced by your own UPPMAX username.

1.2 Create new directory

Before you start with the following assignments, please create a directory PythonLab1 in your ~/glob/ directory. In this directory save all the files you create during this assignment.

1.3 Assignments

For the first assignment you should get familiar with the Python-interpreter. In the second assignment you write your first Python program using an editor. More instructions are given in the following how to use both, the Python-interpreter and an editor. Good luck!
2 Assignmet - Python

Load the module for Python 3 with the command module load python/3.5.0.
Open the Python-interpreter with the command python3.
You should then see at the beginning of the line: >>>. In this exercise we use only the Python-interpreter.
You can leave the Python-interpreter when you type quit().

1. Type in the Python-interpreter the following command:

    print("Assignment7")

What happens?

2. Enter now i = 10 in the Python-interpreter and then (in a new line) print(i).
   After that (in a new line) enter j = i/2 and (in a new line) print(j).

Which values are displayed and why?

**Hint:** With type() the type of a variable can be determined. For example, type("hello") returns <class 'str'> which means that "hello" is of type string.

3. Assign to variable 7Assignment the string black magic. Don’t forget to put the string in quotation marks (" ").
   Which error occurs and why?

4. Assign to variable A a sequence AGCTA (don’t forget to put the sequence in quotation marks). Use the built-in function len() to determine the length of the sequence A and assign the length of A to variable i. Print A and i.
5. Concatenate A and i and print the result.
   What happens and why?

6. Enter now print(A + str(i)).
   What happens now and why?
   **Hint:** What might the built-in function `str()` do? There are also other built-in functions, e.g., to convert a string or number to an integer: `int()`, or to convert a string or number to a floating point: `float()`.

7. Print the substring of A from position 2 to 4.
   The output should be: GCT.

8. Print the prefix (beginning of a string) of length 2 and the suffix (end of a string) of length 2 of the sequence stored in A.
   The output should be AG and TA.

9. Write a for-loop with the loop variable i, which runs from 0 to `len(A)` and prints out i.
   **Hint:** Don’t forget to indent the body of the for-loop.
   Execute the same for-loop a second time and print out the character at each position of string A using A[i] as well.

10. Add now an if-condition inside the for-loop, which checks if i < `len(A)`/2. Only print i and A[i] if this condition is true.

11. Write a while-loop, which produces the same output as the for-loop and if-condition together.

12. Print the variable A again. What happens?

13. Leave the interactive mode of Python with `quit()`.

14. Now return to the interactive mode of Python and print the variable A. What happens now and why?
3 First small program

Open your favorite editor (nano, gedit, etc.) and write in the file named compare.py your first Python program.

**Hint:** When you type

```
$ gedit compare.py&
```

in the terminal, a new line in the terminal should appear (if not press `<ctrl C>`). Then you can run your program in the same terminal window:

```
$ python3 compare.py
```

The advantage is that you can edit your program and switch easily between the editor and terminal window.

1. Write a short program which compares two variables \( i \) and \( j \). It should print the value 1, if \( i \) and \( j \) are equal, and otherwise the value 0.

2. Within the program assign different numbers to \( i \) and \( j \), e.g.:

   a) \( i = 3 \) and \( j = 4 \) and

   b) \( i = 10 \) and \( j = 10 \)

Does your program work?