Introduction
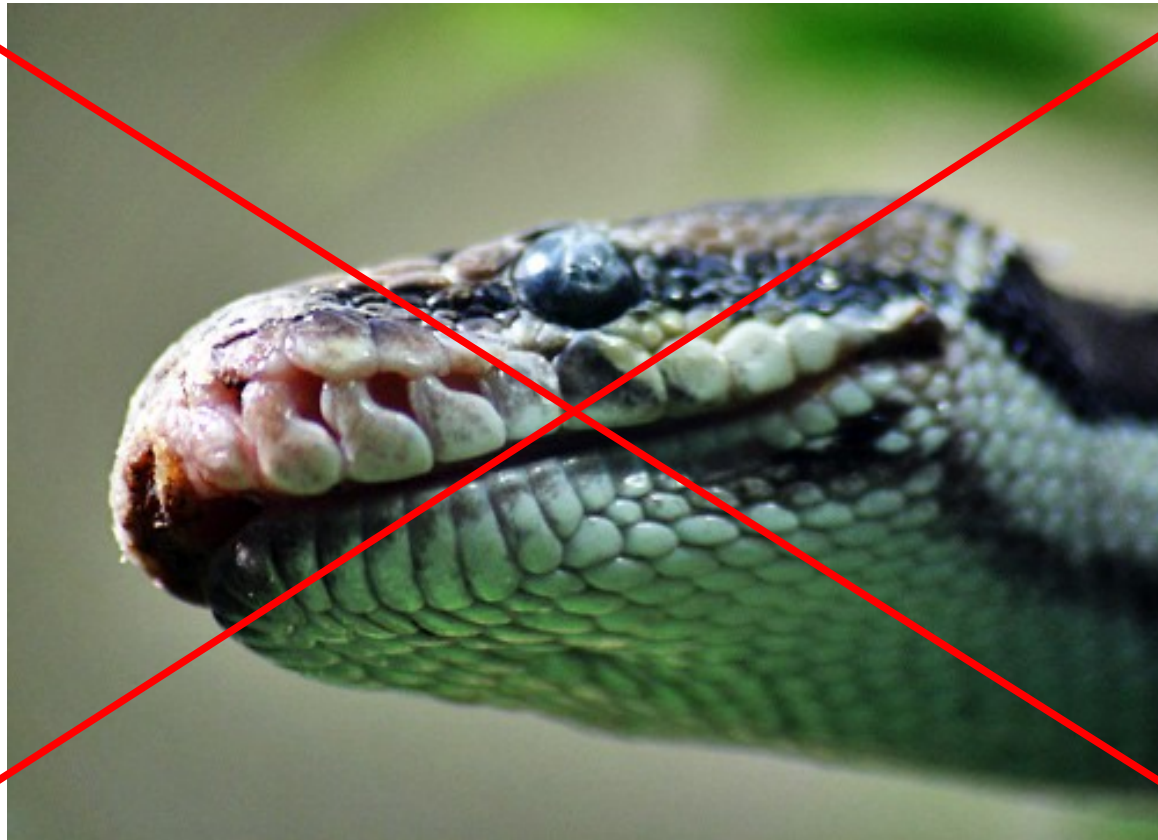## To Python

What is python ?

Python is

- A snake

Python is

- ~~A snake~~

python™ is

- Interpreted language
- Multi-platform
- Using dynamic typing
- Integrating a garbage collector
- Having a lot of external modules
- Written under GPL
- Fun !

Python compared to C

```c
include <stdio.h>

int main(int argc, char*argv[])

{

    int a, b, sum;

    printf('Number1:\n')

    scanf('%d', &a);

    printf('Number2:\n')

    scanf('%d', &b);

    sum = a + b;

    printf('%d\n', sum);

}
> gcc -o sum sum.c

> ./sum
```

```python
a = float(raw_input('Number1:')
b = float(raw_input('Number2:')
sum = a + b
print sum
> python sum.py
```
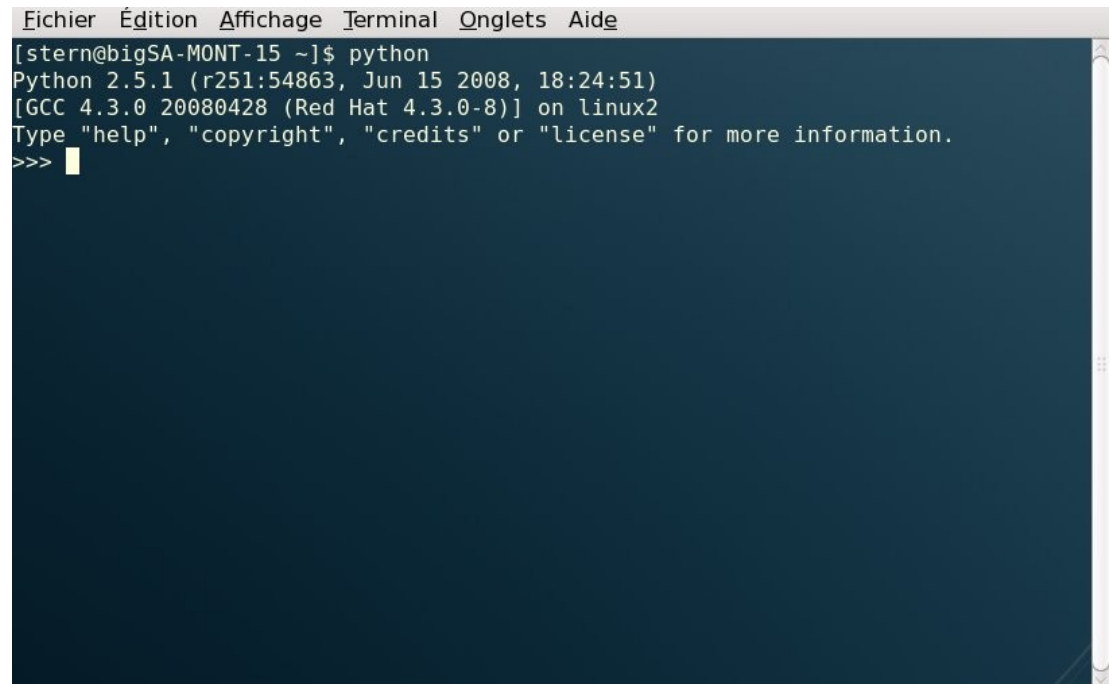
Indentation

- Be careful

```
i = 0
while i != 10 :
    ...
i = i + 1
```

```
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    ...
    i = i + 1
```

Starting with python

- http://www.python.org/

- Console

  – Work in real time with data

- Script

  – Execute file

Variables

- Declaration

>> my_var = "here is my variable"

- Dynamic typing

```
>>> A = "Hello World"
>>> B = 12
>>> type(A)
<type 'str'>
>>> type(B)
<type 'int'>
>>> A=B
>>> type(A)
<type 'int'>
```

Variables

- Numeric
  - Integer
  - Long
  - Float
  - Complex
  - Octal
  - Hexadecimal
- Boolean

Variables

- String

```
>>> my_string = 'Python'
>>> print "Programming in %s is cool" %
my_string
Programming in Python is cool
>>> my_string +  ": super"
"Python: super"
```

Variables

- Lists

```
>>> days = ['Monday','Tuesday','Saturday']
>>> days[0]
'Monday'
>>> len(days)
3
>>> days.append('Sunday')
>>> print days
['Monday', 'Tuesday', 'Saturday', 'Sunday']
```

Variables

- Dictionaries

```
>>> aminoacid = {'Ala':'Alanine','Arg':'Arginine'}
>>> print aminoacid
{'Arg': 'Arginine', 'Ala': 'Alanine'}
>>> aminoacid['Ala']
'Alanine'
>>> aminoacid.keys()
['Arg', 'Ala']
>>> aminoacid.values()
['Arginine', 'Alanine']
```

Python how to ?

while

```
i = 0
while i != 10 :
    i = i + 1
    print "i equals :%d" % i
```

for

```
for day in ['monday','tuesday','saturday']:
    print "%s" % day
```

```
for i in range(1, 5):
        print i
```

if elif else

```
taste = raw_input('Which aliment?')
if taste == 'Chips':
    print 'Miam'
elif taste == 'Spinach':
    print 'Beurk'
else :
    print 'Nothing to say'
```

Functions

```python
def number_words(input, debug = False):
    words = input.split(' ')
    if debug:
        print words
    return len(words)

input = raw_input('Write a sentence: ')
nb_words = numer_words(input)
print "The string:'%s' contains %d words" % (input,
nb_words)

Result:
Write a sentence: I love bioinformatics
The string:'I love bioinformatics' contains 3 words
```

Working with files

```python
infile = open('filename', 'r')
outfile = open('filename' + '.out', 'w')

count = 1
for line in infile:
    outfile.write("%d : %l" % (count, line))
    count += 1

infile.close()
outfile.close()
```

Regular expressions

'6.8874,4.549,56040,0,0,0,0' extract this from file

'30,26,610,0'   but not this

```python
import re

...

for line in file:
    m = re.search(r'^(\d+\.\d+),.+?,(\d+),', line)
    if m:
        amp = m.group(1)
        time = m.group(2)
        data.append((time, amplitude))
```

Homework: ORFs detection