

COMP 383 Computational Biology

Intro to Python

Spring 2018

Loyola University Chicago

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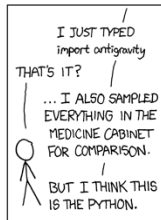
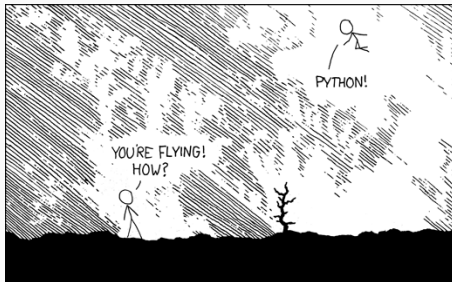
Why Python?

1. Everybody's doing it. It has a large (and growing) user base among scientists.
2. Python is a general purpose, high level, programming language – you should be able to do anything you want to do using Python, and it should be relatively easy to accomplish.
3. It's free, well-documented, and runs on all operating systems.

Why Python?

4. It's easier for novices to pick up than most other languages and it's also used by many professional programmers. This makes collaborating with both novices and experts easier.
5. A dynamic language like Python allows us to write small programs quickly and to also manage the complexity of larger ones.
6. If we want to squeeze every last ounce of performance out of our hardware, then a compiled language (e.g. C, C++) is better, but if we want to quickly answer a research question or build a pipeline around other software, Python is often easier/faster.

Why Python?



Python 2 vs. Python 3

For this class, I recommend Python version 3.x rather than Python 2.7

- ROSALIND assumes 2.7, so some of the ROSALIND hints may require slightly different syntax
- Demo some differences between python2 and python3 on compbio
- <https://boole.loyolachicagocs.org/guacamole/#/login/>

Python 3 Strings - Try in console

```
print("Hello, World!")  
a = "Hello"  
b = "World"  
type(a)  
print(a + ", " + b + "!"*3)  
a[0:4]
```

```
## Hello, World!  
## <type 'str'>  
## Hello, World!!!  
## 'Hell'
```

Python 3 Numbers - Try in console

```
a = 12
b = 2.5
a + b
c = a + b
type(a)
type(b)
print(str(a) + " + " + str(b) + " = " + str(c))
```

```
## 14.5
## <type 'int'>
## <type 'float'>
## 12 + 2.5 = 14.5
```

Python 3 Division - Try in console

```
17 / 5
```

```
17 // 5
```

```
17 % 5
```

```
type(17 / 5)
```

```
type(17 // 5)
```

```
type(17 % 5)
```

```
## 3.4
```

```
## 3
```

```
## 2
```

```
## <type 'float'>
```

```
## <type 'int'>
```

```
## <type 'int'>
```


Recommended IDE for testing scripts: Jupyter Notebook

Available on the compbio server through your browser.
Log in at <http://compbio.cs.luc.edu:8000/>.


- If not on a campus wired connection, you must connect to LSA first. See [here](#) for LSA setup.
- **Remember your PIN!**
- Course specific details are [here](#).

To Install Python Locally

- Not required, but useful if you want to work offline
- I recommend the **Anaconda distribution**
- Includes bunch of packages useful for scientific computing and Jupyter Notebook
- Go to <https://www.continuum.io/downloads> and select Python 3.x version

Start first assignment in ROSALIND

<http://hwheeler01.github.io/CompBio/assignments/>


SALIND

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COMP 383/488 Spring 2018

by Heather Wheeler at Loyola University Chicago

Each problem is due by **2:30 PM** on the date listed.

You will be required to upload your commented code with solution to each problem. **Please submit either `.txt` or `.py` files.** You are welcome to run your code in jupyter notebook, but I do not want `.ipynb` or `.html` files. Make sure you only upload the code used to solve the particular problem. Extra, unnecessary code will result in a reduced grade.

Your code must be commented in your own words and turned in independently. Code should be commented sufficiently so someone learning Python can understand it. If you don't comment your code, you can only get a maximum of half credit for each problem. If you work together with someone in class, make sure your code and comments are your own. Do not cut and paste others' work. Cheating includes submitting as your own work something that has been written by another person and/or found on a web site. You may be asked questions about how your code works and your comments will help you explain. Inability to answer such questions will result in a reduced grade.

```
#Here are some examples of comments
#assign 55 to the variable x
x = 55
#divide x by 10 and assign the result to y
y = x/10
```

Return to [Course Schedule](#).

Num	Title	Solved By	Cost	Due Date	Questions	Solutions
1	Installing Python	0	1	Jan. 23, 2018	⋮	⋮
2	Variables and Some Arithmetic	0	1	Jan. 23, 2018	⋮	⋮
3	Strings and Lists	0	1	Jan. 23, 2018	⋮	⋮

Feedback