



Intro to Python

Sharon Solis

Research Computing Consultant
Enterprise Technology Services (ETS)
Center for Scientific Computing (CSC)
swsolis@ucsb.edu
Elings Hall 3229

Fuzzy Rogers

Research Computing Administrator
Materials Research Laboratory (MRL)
Center for Scientific Computing (CSC)
fuz@mrl.ucsb.edu
MRL 2066B

Paul Weakliem

CNSI Research Computing Support
California NanoSystems Institute (CNSI)
Center for Scientific Computing (CSC)
weakliem@cnsi.ucsb.edu
Elings Hall 3231



Other Research IT



Ted Cabeen
Life Sciences
Chemistry
ted.cabeen@lscg.ucsb.edu



Michael Colee
Earth Research Institute
(ERI)
mtc@eri.ucsb.edu



Steve Miley
Bren School of Environmental
Science & Management
smiley@bren.ucsb.edu



Glenn Schiferl
Physics
glenn@physics.ucsb.edu

Jim Woods
Marine Science Institute
jwoods@msi.ucsb.edu

Letters & Science IT
help@lsit.ucsb.edu
(805) 893-4357



Pre-class Instructions:

Python

[Python](#) is a popular language for research computing, and great for general-purpose programming as well. Installing all of its research packages individually can be a bit difficult, so we recommend Anaconda: <https://www.anaconda.com/distribution>, an all-in-one installer.

Regardless of how you choose to install it, please make sure you install Python version 3.x (e.g., 3.7 is fine). Here are further instructions on how to install Anaconda on Windows, Mac or Linux:

<http://carpentries.github.io/workshop-template/#python>

Obtain lesson materials

1. Download Data Set:
<http://swcarpentry.github.io/python-novice-inflammation/data/python-novice-inflammation-data.zip>
2. Download Python Code:
<http://swcarpentry.github.io/python-novice-inflammation/code/python-novice-inflammation-code.zip>
3. Create a folder called swc-python on your Desktop. Move downloaded files into this newly created folder.
4. Unzip the files. You should now see two new folders called data and code in your swc-python directory on your Desktop.

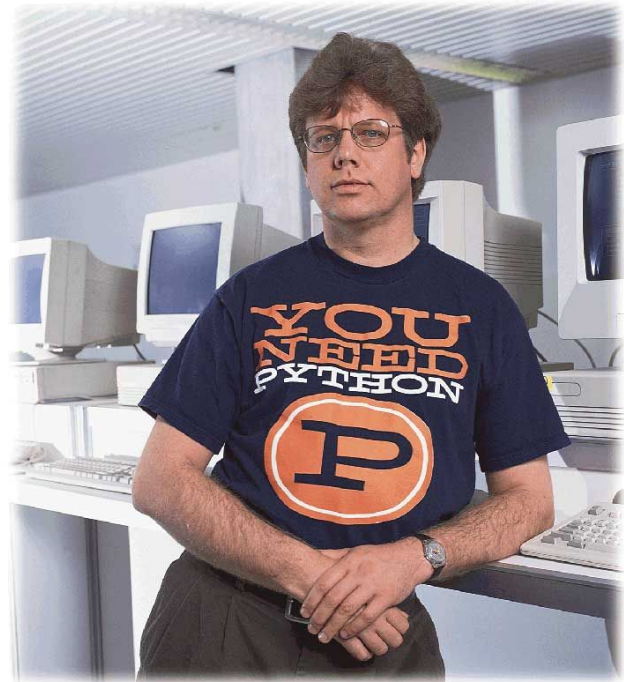


Post-It Notes

- Red: Help needed
- Green: Good to go

What is python™

- High level general purpose language, using more natural English language to emphasize code readability
- Created by Guido van Rossum in the Netherlands, first released in 1991
- Core philosophy, *The Zen of Python*:
 - Beautiful is better than ugly
 - Explicit is better than implicit
 - Simple is better than complex
 - Complex is better than complicated
 - Readability counts





Who uses Python?



INDUSTRIAL
LIGHT & MAGIC

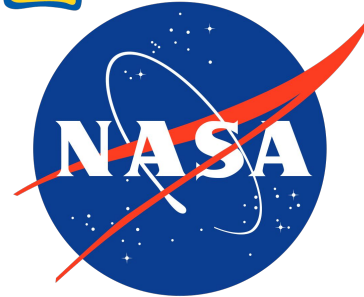


Google



 Journyx

You  Tube





Why Use Python?

- Open-source
- Easy to learn, good first language (great foundation for C, C++, Java)
- A large community of users, scientists, and developers
- Lots of libraries spanning many disciplines:
 - **Bioinformatics:** Biopython
 - **Numerical and Scientific computing:** Numpy, Scipy, Dask
 - **Statistics:** Scipy, Statmodels
 - **Visualization:** Matplotlib, Seaborn, Bokeh
 - **Data analysis:** Pandas
 - **Machine learning:** Scikit-learn
 - **Image processing:** OpenCV, Skimage
 - **Deep learning:** Tensorflow, Theano, Pytorch,....

ANACONDA NAVIGATOR

Desktop Portal to Data Science

ANACONDA PROJECT

Portable Data Science Encapsulation

DATA SCIENCE LIBRARIES

Data Science IDEs



Analytics & Scientific Computing



Visualization



Machine Learning



...and many more!



Data Science Package & Environment Manager



Post-It Notes

- Red: Help needed
- Green: Good to go



Data Set

- Data Set, Code and Lesson Material available here:
<http://swcarpentry.github.io/python-novice-inflammation/>



What is a Script?

- How to run code
- Save yourself work!
- Don't need to type over and over again
- Move easily between machines



Using Python on a Cluster

- Use R not RStudio on the cluster
- Make sure your R code runs from start to end on your own machine
- Perform tests on your computer first
- A simple script (text file) can be used to submit to the queue:

```
#!/bin/bash
#SBATCH -N 1 -n 1
cd $SLURM_SUBMIT_DIR
python myfile.py
```



Using Python on the Cluster

```
#!/bin/bash
#SBATCH -N 1 -n 1
cd $SLURM_SUBMIT_DIR
python myfile.py
```

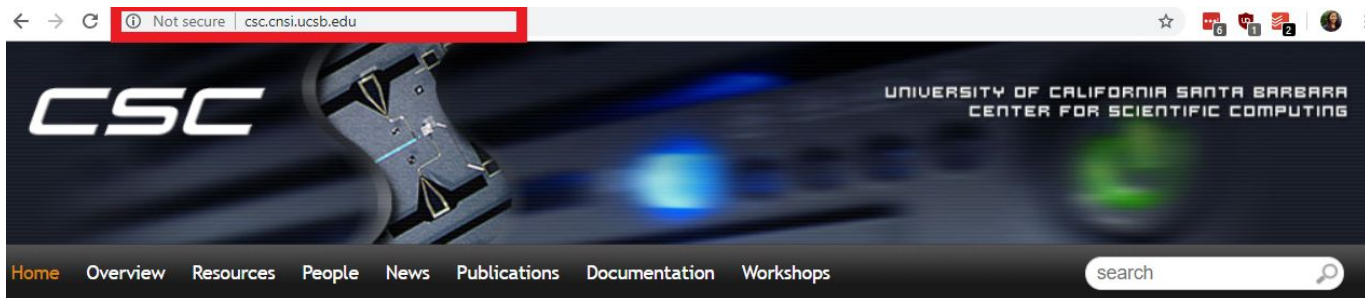
#!/bin/bash : the shell you are using

#SBATCH -N 1 -n 1 : Asking for one node and one task per node

cd \$SLURM_SUBMIT_DIR : change directory to the one where job is submitted from

Python myfile.py : Run your python myfile.py code

How to Request a User Account



Fall 2018 Workshops

CSC will be presenting a set of courses on research computing topics during the fall quarter. Come to any which of are interest to you - although RSVP so we're sure to have enough seating and food! Each seminar will be 45-60 minutes on a topic, followed by pizza lunch where you'll have a chance to follow up with CSC staff, and other attendees.

All seminars are in Elings 1601 followed by lunch (also in 1601). [View the schedule and register here.](#) Completed talks slides are [here too.](#)

Request User Account

Request a User Account to Utilize CSC computing resources.

[Request Form](#)

If you have an account and need to activate it for Pod.

[Pod Form](#)



How to Learn More Python

- Online Tutorials:
 - [Learnpython.org](https://learnpython.org)
 - [Google's Python class](#)
 - [Principles of Computing in Python](#) from Carnegie Mellon's [Open Learning Initiative](#)
 - You can click the "Enter Course" button to take a look at the course without creating an account
 - If you want to save your work, you can create an account.
 - [Lynda.com](#) (available to UCSB employees, including student employees)
- One-on-One Consultation
 - Center for Scientific Computing (Elings Hall 3229)
 - Collaboratory
- Books
 - UCSB students, staff and faculty (i.e. anyone with a UCSBNetID, or access to computer on campus), you can get free access to a zillion great Computing related textbooks here <http://proquest.safaribooksonline.com/>



Contact Us

Webpage: csc.cnsi.ucsb.edu

Sharon Solis

Research Computing Consultant
Enterprise Technology Services (ETS)
Center for Scientific Computing (CSC)
swsolis@ucsb.edu
Elings Hall 3229

Fuzzy Rogers

Research Computing Administrator
Materials Research Laboratory (MRL)
Center for Scientific Computing (CSC)
fuz@mrl.ucsb.edu
MRL 2066B

Paul Weakliem

CNSI Research Computing Support
California NanoSystems Institute (CNSI)
Center for Scientific Computing (CSC)
weakliem@cnsi.ucsb.edu
Elings Hall 3231