Introduction to Python

Jerry Ebalunode

Center for Advanced Computation and Data Systems
(CACDS)

jebalunode@uh.edu

http://www.cacds.uh.edu
http://support.cacds.uh.edu

University of Houston
Houston, TX

First Access Your Account

- Log into your accounts
  - Username or login = hpc_user**X**
  - Where x = sign in serial number 1 – 47
  - Password = **cacds2014**
- Use your web browser
    - Firefox, Chromium or Google chrome
- Slides could be downloaded from URL below

  http://129.7.249.171/workshops/intro2python.pdf

Getting Started

- Use the terminal to download intro2python.zip file to your home directory
  - Run the following commands

```
cd
wget   http://129.7.249.171/workshops/intro2python.zip

unzip intro2python.zip
cd intro2python
module load python
```

- Now, you can begin working with tutorial files on your terminal

Overview

- What is Python?
- Data-types
  - strings, lists, dictionaries
- Syntax and language structure
  - (if-then statements, looping)
- Defining functions & classes
- Importing modules
- Reading and writing files
- Introduction to object oriented programming
- Handling errors

Python

- A dynamic, multi-purpose, object-oriented programming language
  - high-level language
    - built in high-level data types i.e. flexible arrays, dictionaries
  - extensible
    - new code, extends objects & definition, or system type modification at runtime.
- Developed by Guido van Rossum
  - Early 1990s, Netherlands
- Named after the BBC show “Monty Python’s Flying Circus”
  - nothing to do with reptiles
- Currently two main branches
  - Python 2.x now at version 2.7.9 (larger codebase)
  - Python 3.x now at version 3.4.1
- Official URL http://python.org/
- Open source software

Why You Should You Learn Python?

- Clear, readable, simple, syntax
  - Pseudo code like syntax
- Features powerful extensive standard library
  - batteries included
  - async processing to zipping covered
- Shallow learning curve
- Free
- Portable
  - Runs almost anywhere
- Large community of developers
  - wide academic and industrial acceptance
  - Lots of packages allowing python to do almost all forms of computing

Ipython

- A highly interactive interpreter for developing python code

- Please run on your desktop terminal

  Command should open up a browser window

- cd ~/intro2python

  ipython notebook

Data Types

- Primitive/Basic types
  - int
  - float (double precision only)
  - bool
  - str (but also treated as an ordered compound type)
- Compound types and containers
  - complex number
    - real and imaginary parts
  - ordered types (also called sequences)
    - strings, lists, and tuples
  - unordered types
    - sets and dictionaries
- some types are mutable, i.e., values can be changed in-place
- some types are immutable
  - values cannot be changed in-place
  - instead a new object must be allocated as the result of an operation
- e.g., strings and tuples

Application Support

- Computational scientists are available for
  - consultation and training
  - We can help with porting your homebrew code and domain applications to run on the cluster
  - We can also help with developing proposals that involve use of HPC (i.e. make use of Cluster resources).
  - Help requests
    - Visit ➔ http://support.cacds.uh.edu/training-form.php
      - To Open A Support Ticket

- Administrative questions can be submitted to the cluster admin staff and anyone who can help will respond.
  - Visit ➔ http://support.cacds.uh.edu
    - To Open A Support Ticket