medford-group / data_analytics_ChE

Code Issues Pull requests Actions Projects Security Insight

Dismiss

Join GitHub today

GitHub is home to over 50 million developers working together to host and review code, manage projects, and build software together.

Sign up

master

data_analytics_ChE / 1-numerical_methods / Topic1-Python_Basics.ipynb

Sihoon Choi exercises updated History

0 contributors

Raw Blame

1404 lines (1404 sloc) 229 KB

Table of Contents

- 1 Why Python?
  - 1.1 Python vs. Matlab
    - 1.1.1 Advantages:
    - 1.1.2 Disadvantages
  - 1.2 Python vs. Compiled (C++, Fortran):
    - 1.2.1 Advantages:
    - 1.2.2 Disadvantages:
- 2 Python "packages"
- 3 Defining Functions
- 4 Classes, attributes, and methods
- 5 Reading in data
- 6 Plotting data
- 7 Integrated Development Environments (IDE's)
- 8 Python "gotchas"
  - 8.1 Tabs and spaces
  - 8.2 Numpy array copying
  - 8.3 Integer type casting
  - 8.4 Lambda functions vs. Lambda variables

Python Basics

This course will utilize the Python programming language. Some of you may be familiar with Python, but others may have only worked with MATLAB. Python is similar to MATLAB, but there are a few key differences and transitioning can take some effort. There is a nice guide available for transitioning from MATLAB to Python (https://www.enthought.com/wp-content/uploads/Enthought-MATLAB-to-Python-White-Paper.pdf) which is strongly recommended for students who have not worked with Python before. The Introduction to Python Programming (https://nbviewer.jupyter.org/github/jrjohansson/scientific-python-lectures/blob/master/Lecture-1-Introduction-to-Python-Programming.ipynb) from Johansson is also a great place to start. We will not spend a lot of lecture time specifically discussing Python, but this lecture will introduce some important ideas and provide examples for using Python in data analytics.

If you are new to Python, the learning curve may feel very steep. However, we will hold additional help sessions, and encourage you to search internet resources like Stack Overflow (https://stackoverflow.com/) and the official Python tutorial (https://docs.python.org/3.6/tutorial/index.html) or work with more experienced students to learn.

Why Python?

- Python is commonly used for data analysis, and is growing rapidly
- Python is a full programming language