EFM Fall 2014, Week 1: Introduction

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Introduction to EFM

History

The Economic and Financial Modeling Club (EFM) was founded in the Spring of 2012 by Eric Wu (AB '14) and Runnan Yang (AB '14) with the goal of combining economic and financial theory with practical computing to carry out rigorous and data-driven academic research.

Weekly Meetings

- Wednesdays, 4-5pm
- Ryerson 276

Introduction to EFM

What do we do?

- Python / Matlab / R Workshops
  - Data manipulation, web-scraping, simulations, etc
- Portfolio Theory, Empirical Asset Pricing
- Reading academic papers and chilling out
- Annual Algorithmic Trading Competitions

Board Members

Jason Phang (zphang@uchicago.edu)

- 4th-year, majoring in Economics, Mathematics and Statistics
- UChicago Careers in Business: Financial Markets
- Interned at Old Mission Capital (2013)
- Interned at AQR Capital Management (2014), returning full-time in 2015
- Primary Languages: Python, R
- Current Interest: Empirical Asset Pricing, Machine Learning

Board Members

Allan Zhang (zhangallan@uchicago.edu)

- 3rd-year, majoring in Economics
- Interned at Novo Surgical (2014)
- Research Assistant for Glen Weyl
- Primary Language: Python
- Current Interest: Monetary Policy, Industrial Organization

Shameless Plug

We have a history of **really good job placements**:

- Quant Hedge Funds
- New York Fed
- Strats/Modeling divisions of banks
- Proprietary Trading
- Economic Consulting
- Regular Investment Banking

Schedule

Tentative Lineup (May vary depending on prior experience)

- Week 2: Introduction / Setup
- Week 3: Python Workshop, File I/O (Working with data sets)
- Week 4: Python Workshop, Statistics
- Week 5: Portfolio Theory
- Week 6: Capital Asset Pricing Model (CAPM), Least-Squares Regressions
- Week 7: Fama-French factors, other pricing anomalies
- Week 8: -Buffer-
- Week 9: End-of-Quarter fun times

Programming Tools

- Commonly used languages/packages for statistical analysis:
  - Python, Matlab, R
  - "Statistical Packages": Stata, SPSS, SAS, EViews...
- **Python**
  - An easy, fast, and highly effective programming language
  - A lot of third-party documentation and development for some very useful libraries
- **R**
  - Statistical programming language
  - Great for statistical functions, not so great for general purposes
- **Matlab**
  - Not free :(
  - Very powerful for operations with matrices, commercially optimized

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Getting Started with Python

Why Python?

- Emphasis on code-readability and ease of use
- Effective for teaching programming concepts, while powerful enough to do statistical analysis and other tasks
- Wide number of uses:
  - Machine Learning
  - Natural Language Processing
  - Web Frameworks

Things to Install

Canopy

- A packaged version of Python that comes with many libraries pre-installed (NumPy, SciPy, Pandas, Matplotlib, etc)
- https://www.enthought.com/products/canopy/

pip

- This is a tool for installing other Python libraries.
- https://pip.pypa.io/en/latest/installing.html

Sublime

- Text-editor
- http://www.sublimetext.com/2

Running things in Terminal/Command Prompt

Terminal/Command Prompt is a text-based interface where all the cool people get things done, so learn to use it.

- Mac Users: Open the "Terminal" application
- Windows Users: Start $\rightarrow$ Run $\rightarrow$ cmd
- Linux Users: Stop being so try-hard :(

Simple commands

- **cd FOLDER**: Change directory to FOLDER
- **ls** (for Mac/Linux) / **dir** (for Windows): List files/directories in current directory
- **cd ..**: Go to parent directory

Running Python

1. Run **python** in terminal to open the python shell
   - Try running **2+2**
   - Try running **print "Hello World!"**
   - Try running **print [x**2 for x in range(15)]**
   - Type **exit()** to exit.
2. Save the same commands to a text-file "MYFILE.py" and run **python MYFILE.py**
   - Make sure you're in the right directory
   - Which line didn't appear?
3. Do the same thing, except using the command **ipython** instead of **python**
   - IPython is a python library that gives you a much nicer python shell to work with
   - It's worth exploring its myriad features online

IPython Notebooks

The best part of IPython is a feature called "IPython Notebooks" (IPYNBs)

1. Run **ipython notebook**. Something should open in your browser.
2. IPython notebooks are an extremely nifty combination of interactive HTML/Javascript funkiness, with a Python backend
3. It's extremely useful for package/testing code, exploring data, plotting things, etc.
4. **Don't use it for serious software development.**

Final Notes

Homework!

- **Complete diagnostic test and submit by next Monday.**
- Ensure that your Python/Canopy installations are working.
- Read up on Python, experiment with Python/IPython notebooks.

All materials are available on Github:
https://github.com/zphang/efm-2014-2015

Final Notes

Some additional resources

- http://learnpythonthehardway.org/: Good, brute-force tutorial
- http://www.codecademy.com/en/tracks/python: A more interactive Tutorial
- (Book) Python for Data Analysis by Wes McKinney
- (Book) Python Cookbook

See you next week!