# ECON-UA 370 Quantitative Econ with Python

Lecture 1: Introduction

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January 2016

## Introduction to the Course

The aim of this course is to teach Quantitative Economics alongside the programming language Python.

Some topics in this course include:

- Python Programming Fundamentals
- Linear State Space Models
- Working with Data in Python
- Markov Chains
- The Lake Model of Employment and Unemployment
- ...

# Topic Schedule

Weeks 1-3   Python: Programming Fundamentals

Weeks 4-8   Python: Linear Algebra, Linear State Space Models, Discrete Markov Chain, and the Lake Model

Week 9   Python: Object Oriented Programming

Week 10   McCall Search Model

Week 11   Python: Data Analysis and Manipulation using Pandas

Week 12   Permanent Income Model

Weeks 13-14   Extension Topics (Asset Pricing, Kalman Filters)

Full syllabus is available on the course GitHub page.

## Course Website

Where do you get lecture slides, course notes, and assignments?

**Github**[1]

                    https://github.com/mmcky/nyu-econ-370

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[1]A great online collaborative tool when working with Git

## Requirements ...

The requirements for this course are:

- A laptop
- Anaconda Python Distribution
- see Alfred for course prerequisites

## Week 1 Assignment

First Assignment

Install the Anaconda Python distribution (Ready for Thursday Class)

https://www.continuum.io/downloads

Install Guide: **install-local-guide.pdf** on GitHub

# Demo

Let's have a look at some of the things you will learn in this course:

1. Constrained Optimization (Demand with a Budget Constraint)

2. Linear Algebra

3. Schelling's Segregation Model

4. Lake Model

Additional Slides if Time Permits

# Quick Survey

Who has done some programming before?

Who has used Python before?

# Why Python?

Python is:

1. free
2. a full programming environment
3. easier to learn than some other languages
4. has a large package library
5. has a large community
6. ...

Provides a powerful environment for scientific research and computation.

## Python 2.7 or 3.5?

Python 2.7

- Pro
    - More packages are available in Python 2.7
    - A lot of examples are written in Python 2.7 syntax.

- Con
    - In maintenance mode - not getting new features as the language develops over time.

Python 3.5 (Best **default** selection)

- Pro
    - Newest version which is the long term future of Python
    - Most of the scientific stack has been ported to Python 3

- Con
    - Sometimes want to use a library which has not been migrated to Python 3 yet. (but can make use of conda environments if needed)

# Best way to Learn Programming?

The best way to learn is through practice ...

Start with small programs and then move onto larger applications.

This process is time consuming – but it can also be fun!

# Installation Guides

The following installation guides are available for:

1. Linux[2]
2. OS X
3. Windows

on the course Github site:
https://github.com/mmcky/nyu-econ-370.git.

Part of Assignment #1 is to setup Anaconda on your own laptops.

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[2]Ubuntu and its derivatives are the most commonly. Linux Mint is used in the installation guide.

# Jupyter

Jupyter is an excellent interactive environment in the Data Science community

Learn more **here**

Jupyter Demo

## Some simple tests

Run these commands in a terminal.

1. Try updating conda by typing: `conda update conda`
2. Try updating the anaconda library by typing:
   `conda update anaconda`
3. Open IPython Notebook by typing: `jupyter notebook`. Open a
   new notebook and try out a few python examples
4. Install QuantEcon library by typing in a terminal:
   `pip install quantecon`. Next open an Jupyter notebook and
   try importing the library using: `import quantecon as qe` in
   one of the code blocks

**Note:** For Windows systems these should be run in a cmd or
powershell terminal.