Computational Economics (Python) - CAEN/UFC

Instructor: Marcelo Aarestrup Arbex
Period: October 15 - 25, 2019
Lecture Time: 9:30am - 12:00am
Lecture Location: TBD

A. Course Description

The main goal of this course is to introduce students to computational economics using Python. Python is a general-purpose programming language conceived in 1989 by Dutch programmer Guido van Rossum. Python is free and open source, with development coordinated through the Python Software Foundation. Python has experienced rapid adoption in the last decade and is now one of the most popular programming languages. This course will heavily use materials from Dr. Juergen Jung (Economics Department, Towson University) and QuantEcon `https://python.quantecon.org/`, which hosts lecture series on economics, finance, econometrics and data science.

List of Topics (*tentative dates*)

1. Introduction - **October 15, 2019**
    - Basic Python Steps
    - Lists, tuples, dictionaries
2. Basic Techniques - **October 16, 2019**
    - If-command
    - for-loops
    - Writing Good Code
    - Debugging
3. Numerical Basics and Scientific Libraries - **October 17, 2019**
    - Numpy, Scipy libraries
    - Vectors and matrices
    - Looping through vectors and matrices
    - Functions
4. Graphs - **October 18, 2019**
    - Matplotlib library
    - Plot function
5. Object Oriented Programming (OOP) - **October 21, 2019**
    - OOP I: Introduction to Object Oriented Programming
    - Class definitions
    - Methods vs attributes
6. Root finding - **October 22, 2019**
    - Newton Algorithm
    - fsolve
7. Optimization - **October 23, 2019**
    - Optimization library

- Minimize a function
- Constrained Optimization
- Optimization library II
- Cake Eating Problem

8. Economic Models - **October 24 - 25, 2019**
    - OOP II: Building Classes
    - OOP III: Samuelson Multiplier Accelerator
    - Overlapping Generations Model
    - Gauss-Seidl Algorithm
    - Growth Model

B. Reference Material

- *Quantitative Economics with Python*, `https://python.quantecon.org/`
- *Economic Dynamics: Theory and Computation*, John Stachurski, The MIT Press, 2009.