Welcome to the SEABC CSE course:

"Python for Structural Engineers (E29)"! 👷

Software used in the course

This course requires a certain amount of software installation and this guide will walk you through it.

No proprietary software is required other than Microsoft Excel. However, the Excel portion is not a compulsory part of the course so do not worry if you do not already have a license.

On that note, this course can be taken on almost any operating system, whether Windows, Linux, or Mac OS. The instructions provided will be for Windows and I will primarily teach the course in Windows. I will assume that if you are on either Linux or Mac OS you have the ability to adapt the installation instructions for your own system which will be similar (although feel free to contact me if you need assistance).

You will be installing the following software:

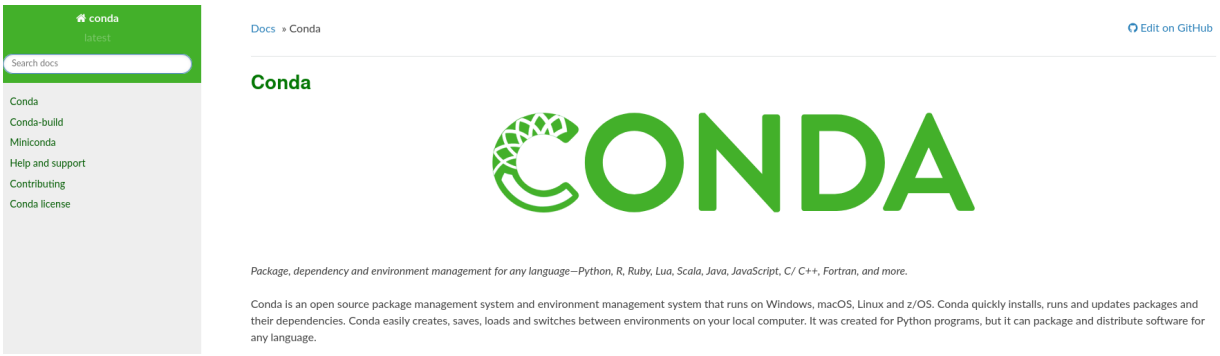
- **Miniconda** - A stripped-down version of the Python distribution offered by Anaconda
- **JupyterLab Desktop** - A new distribution of the popular JupyterLab computation platform
- **GitHub Desktop** - A way of accessing git and the GitHub platform without a command line application

If you have any trouble with the installs:

Email me: `connor@structuralpython.com`

Please also attach any applicable screenshots and a short description of what happened.

About Miniconda



At its most simple, Python is an executable file (`python.exe` on Windows) and a whole bunch of other files in a series of subdirectories. It is an application like many other applications. The purpose of the Python application is to take Python code as text input and to interpret and perform the functions it contains.

It does not have a graphical user interface (GUI). It just runs the Python code you pass it and then it closes.

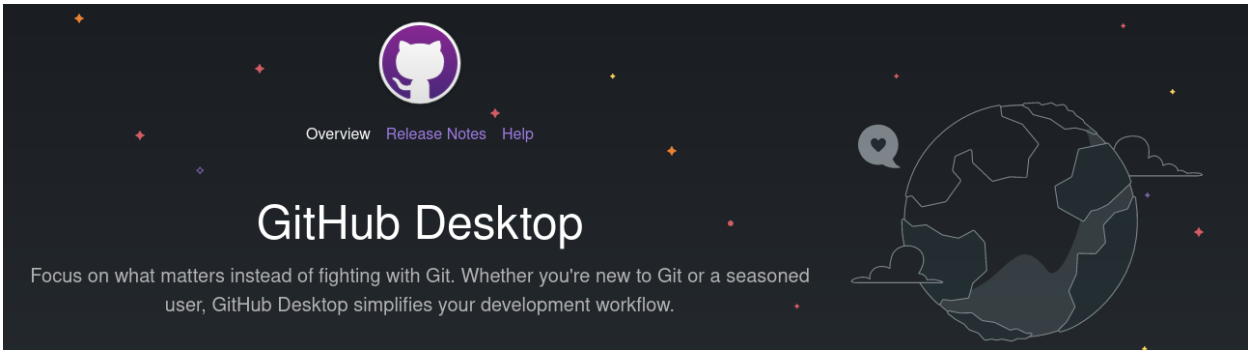
Part of the power of Python is the vast number of *libraries* (that is, pre-written code) freely available for use. Because Python is free software, anyone can package it up and re-distribute it with their own tools.

The Anaconda company distributes a version of Python with a piece of their own software called `conda` . Conda is a useful tool for installing libraries and creating "virtual environments" (separate, stand-alone copies of Python) that allow you to have different combinations of libraries installed. Conda is also free software.

The Anaconda distribution is the most popular distribution for science and engineering because it includes pretty much everything (over 1000 libraries). However this takes a long time to install.

Miniconda is Python with `conda` and a few other tools and installs in a fraction of the time. It allows you to install everything on an "as needed" basis, which we will do.

About GitHub Desktop



`Git` is command-line software for managing a distributed version control system. It was written by Linus Torvalds for the purpose of collaboratively developing the open-source Linux operating system and has since become the world's most popular version control system.

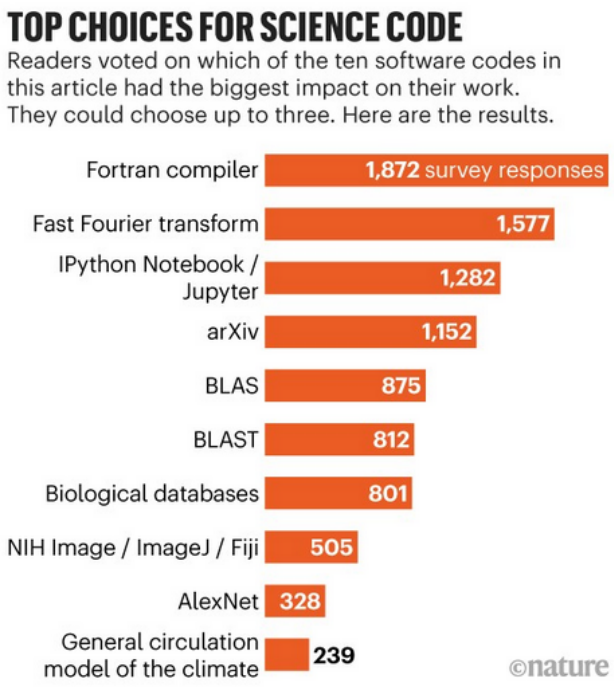
Version control primarily works with text-based files (like computer source code but can work with any text-based document) and keeps a record of all changes that have happened on the file since the time the tracking was initiated. It allows the ability to "go back in time" to see what a file looked like in a past state.

GitHub is a web-based platform for storing software projects that are managed by the git version control system. Code is stored in GitHub as "repositories" (or "repos"). A repo is essentially a directory on a computer somewhere with a bunch of files in it. If it is a repo managed by git, included in the directory is a `.git` directory which has all of the version control information.

GitHub was acquired by Microsoft in 2018 and, since then, has greatly expanded the capabilities and services available on the platform, including the creation of the GitHub Desktop application which allows users to interact with git and GitHub without the command line.

About JupyterLab

Project Jupyter is the organization that develops the interactive computing application, JupyterLab. You can read a short history of Jupyter and its precursor, IPython, on wikipedia. Notably, a Jupyter notebook was used to create the first image of a black hole and is the computing environment of choice of Nobel-winning economist, Paul Romer.



About JupyterLab Desktop

Jupyter is free and open-source software ("FOSS") and is developed and maintained primarily by volunteers. Historically, Jupyter was launched from the command-line using a Python installation. However, in September 2021, Jupyter core-developer Mehmet Bektas announced that he has launched JupyterLab Desktop which can be run just like a regular, stand-alone executable.

Next...

Please install the above three software packages in the 1, 2, 3 order which the attached PDFs are named for.