Ecology Workshop Overview (/ecology-workshop/index.html): Setup for Python workshops

Overview

This workshop is designed to be run on your laptop. First, you will need to download the data we use in the workshop. Then, you need to install some software. After following the instructions on this page, you should have everything you need to participate fully in the workshop!

Data

You can download all of the data used in this workshop by clicking this download link (https://ndownloader.figshare.com/articles/1314459/versions/9). The file is 38.4 MB.

Clicking the download link will automatically download all of the files to your default download directory as a single compressed (`.zip`) file. To expand this file, double click the folder icon in your file navigator application (for Macs, this is the Finder application).

For a full description of the data used in this workshop see the data page (/ecology-workshop/data/index.html).

Software

Software	Install	Manual	Available for	Des
Spreadsheet program	Link (https://www.libreoffice.org/download/download/)	Link (https://documentation.libreoffice.org/en/english-documentation/)	Linux, MacOS, Windows	Spre prog orga tabu
OpenRefine	Link (http://openrefine.org/download.html)	Link (http://openrefine.org/documentation.html)	Linux, MacOS, Windows	Prog repr clea data
Python	See install instructions below.		Linux, MacOS, Windows	Prog lang data and visu
SQLite Browser	Link (http://sqlitebrowser.org/dl/)	Link (https://github.com/sqlitebrowser/sqlitebrowser/wiki)	Linux, MacOS, Windows	Tool crea desi and data files

Spreadsheet program

- To interact with spreadsheets, we can use LibreOffice, Microsoft Excel, Gnumeric, OpenOffice.org, or other programs. Commands may differ a bit between programs, but the general ideas for thinking about spreadsheets are the same. For this workshop, we recommend using either Microsoft Excel (paid software) or LibreOffice (free and open source). Other spreadsheet programs may not have all of the features we will be exploring in this workshop.

- To install LibreOffice, go to their download page (https://www.libreoffice.org/download/download/). The website should automatically select the correct option for your operating system. Click the “Download” button. You will go to a page that asks about a donation, but you don’t need to make one. Your download should begin automatically. Once the installer is downloaded, double click on it (you may need to open your Downloads folder) and LibreOffice should install.

OpenRefine

- OpenRefine is a Java program that runs on your local machine (not on the cloud). Although it displays in your browser, no web connection is needed and your data remains local. You need to have a ‘Java Runtime Environment’ (JRE) installed on your computer to run OpenRefine. If you don’t already have one installed and are running Windows, then you can download the “Windows kit with embedded Java” version from the downloads page. You can also download and install Java from https://java.com by going to the site and clicking “Free Java Download”.
- To install OpenRefine, go to their download page (https://openrefine.org/download.html). From the download page, select either “Windows kit”, “Mac kit”, or “Linux kit” - depending on your operating system - and follow the instructions next to your download link. This lesson has been tested with the recent versions of OpenRefine, at least 3.4.1. **If you are using an older version, it is recommended you upgrade to the latest tested version.**
- You may get an error message: “OpenRefine.app can’t be opened because it is from an unidentified developer.” If you get this message, open your system preferences and click “Security & Privacy”. You will see a message “OpenRefine.app was blocked from opening because it is from an unidentified developer.” Click “Open Anyway” and “Yes”. OpenRefine should open in your default web browser.
- OpenRefine does not support Internet Explorer or Edge. Please use Firefox, Chrome or Safari instead.

Python and Jupyter Notebooks

- Python (http://python.org) is a popular language for scientific computing, and great for general-purpose programming as well. For this workshop we use Python version 3.x. Installing all of its scientific packages individually can be a bit difficult, so we recommend an all-in-one installer. We will use Anaconda or Miniconda. They both use Conda (https://conda.io/en/latest/), the main difference is that Anaconda comes with a lot of packages pre-installed. With Miniconda you will need to install the required packages. We recommend using the Anaconda installation instructions.

Anaconda installation

Download and install Anaconda (https://www.anaconda.com/distribution/#download-section). Remember to choose the installer for Python 3.x. Anaconda does not include the plotting package plotnine. To install this package, open your terminal application and type:

Bash

```
conda install -c conda-forge plotnine
```

Miniconda installation

Miniconda is a “light” version of Anaconda. If you install and use Miniconda you will also need to install the workshop packages. Download and install Miniconda (https://docs.conda.io/en/latest/miniconda.html) following the instructions. Remember to choose the installer for Python 3.x. From your terminal application, type:

Bash

```
conda list
```

To install the packages we’ll be using in the workshop, type:

Bash

```
conda install -y numpy pandas matplotlib jupyter
conda install -c conda-forge plotnine
```

After installing either Anaconda or Miniconda and the workshop packages, launch a Jupyter notebook by typing this command from the terminal:

Bash

```
jupyter notebook
```

The notebook should open automatically in your browser. If it does not or you wish to use a different browser, open this link: http://localhost:8888 (http://localhost:8888).

For a brief introduction to Jupyter Notebooks, please consult our Introduction to Jupyter Notebooks (https://datacarpentry.org/python-ecology-lesson/jupyter_notebooks/) page.

SQL

- SQL is a specialized programming language used with databases. We use a simple database manager called SQLite (http://www.sqlite.org/) in our lessons. We will use the DB Browser for SQLite (http://sqlitebrowser.org/) program, which is available for all major platforms.
- To install the DB Browser, go to their download page (http://sqlitebrowser.org/dl/) and choose the correct installer for your operating system. Once the installer is downloaded, double click on it (you may need to open your Downloads folder), follow any other instructions that appear, and DB Browser should install. After installing, you can delete the installer `.dmg` file.

Congratulations! You are now ready for the workshop!