**Getting Started with the FNNR-ABM Project**

Glossary

ABM – Agent-based Model

OS – Operating System

In order to access and download this project (for Python beginners):

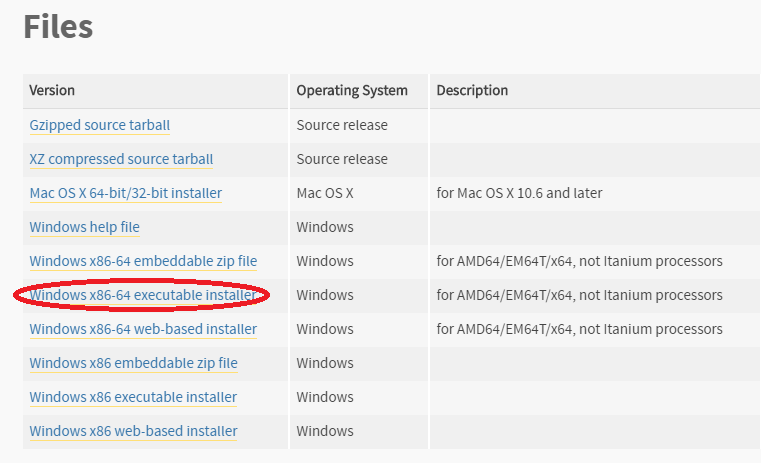
1. Have Python 3+ installed on your computer.

To download the latest version of Python, visit <https://www.python.org/>. At time of writing, [Python 3.6.1](https://www.python.org/downloads/release/python-361/) is the latest verison, though again, any version of Python 3.X.X should work. Python 2.X.X is more stable for use with older systems, but it differs in syntax from Python 3.X.X, so it is not compatible with code from the imported libraries we will use here (such as Mesa).

On the Python download page, scroll to the bottom and select the option that is best for you. For the most common configuration, refer to Figure 1.1; however, it may not apply to you. First, find out if you have a Mac, Linux or Windows OS, then figure out if your OS is 32-bit (x86) or 64-bit (x64). To find this out, view your computer properties (on Windows 10, search or find ‘This PC’ in File Explorer, right-click, and select ‘Properties’ from the menu; other versions of Windows might need you to right-click ‘My Computer’). Most standard newer computers will have the 64-bit version of Windows.

Once you download and run the installer (or configure the zip file/tarball; the installer is recommended), follow the installation steps to install Python 3.X.X onto your computer. If you are not sure what options to pick, do not change the default options. Keep note of where Python is installed on your computer. If it is convenient and fast to do so, restart your computer afterwards.

Figure 1.1 – The most common option. This option may not be right for you if you are not using a 64-bit version of Windows.



2. Download the Python libraries needed for the project (Mesa, openpyxl).

Python has many built-in frameworks and libraries (collections of pre-written functions and modules) that save users time and effort, as well as many more libraries available on the web to download; most common projects will use at least one external library (as opposed to being coded entirely from scratch). The two libraries we must download for the project are:  
  
Mesa – a Python 3+ framework for working with agent-based models

If you install Mesa through pip (covered later here), it will come installed along with the other libraries it depends on, such as Tornado (web framework), Pandas (data structure library), Numpy (for a variety of numerical expressions or generations), Six (for wrapping over differences between Python 2 and 3), Tqdm (progress meter), Matplotlib (for plotting, and more. The user will likely not directly access these libraries when working with Mesa, but they should be aware of what the libraries do.

Openpyxl – helps import data from cells in Microsoft Excel or Open/LibreOffice Calc files

The most common (and Pythonic) way to install external libraries is to open the Command Prompt on Windows (cmd.exe), or a similar terminal on whatever OS you’re using, and type in:

pip install mesa

and when that’s done,

pip install openpyxl

If you are using conda or miniconda (or another environment/package manager), replace ‘pip’ with ‘conda’ in the above commands.

**Troubleshooting**

There are a number of possible error messages you can get.

1. Set Environment Path

2. Change CMD Directory

cd C:\Users\

3. If you are using Anaconda/Miniconda, set up a new environment

4. (similar to 3.) If you have multiple versions of Python

Finally, if your library appears to have successfully installed to the same directory that runs the desired version of Python as configured in your IDE, you may need to restart your computer.

3. (optional) Download a Python IDE.