**IVEN2.0 Use in Python (Windows [cmd] and virtual environment)**August 2023  
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**Data formatting**

This tutorial outlines how to use IVEN2.0 in the Python platform. Data assembly has been made more flexible. Data must now be imported in the following format with only one header row.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ID** | **x** | **y** | **z** | **Properties ……** |
|  |  |  |  |  |
|  |  |  |  |  |

The number of properties columns is not limited, the Python implementation will adapt to the number of extra columns.

**Python Install**

Download the latest stable version of Python from (<https://www.python.org/downloads/>) .

**Setting up your python virtual environment**

These instructions are for a Windows system, see (<https://packaging.python.org/en/latest/guides/installing-using-pip-and-virtual-environments/> ) for information on how to set up the virtual environment on a different system. We use a virtual

1. Open the Windows command line by typing cmd in the lower-right search bar of the desktop, and open the ‘Command Prompt’ app.
2. Navigate to where you have saved the Python IVEN2.0 files, using the cd command. For example:   
   cd Documents\IVEN-2.0\
3. Type py -m pip install --user virtualenv and press enter to install the virtual environment package.
4. Type py -m venv iven-venv and press enter to create a virtual environment called iven-venv.
5. Type .\iven-venv\Scripts\activate and press enter to activate the virtual environment.
6. Install the package requirement within iven-venv using the requirements.txt file by typing py -m pip install -r requirements.txt and press enter. You should now see several packages installing/uninstalling.
7. Type deactivate to deactivate your virtual environment and close the command window.

**Using IVEN2.0**

Running the IVEN2.0 analysis

1. Open the Windows command line by typing cmd in the lower-right search bar of the desktop, and open the ‘Command Prompt’ app.
2. Navigate to where you have saved the Python IVEN2.0 files, using the cd command.
3. Type .\iven-venv\Scripts\activate to activate the virtual environment you created previously.
4. Type py run\_IVEN2.py to run the IVEN analysis. A file window will open, select the file you want to analyse and continue.  
   Using IVEN should then be self-explanatory by using the GUIs that will be displayed and the command window where prompts will be printed.
5. Then either run the analysis on the next file, or type deactivate and press enter, and close the cmd.

Displaying results

1. Open the Windows command line by typing cmd in the lower-right search bar of the desktop, and open the ‘Command Prompt’ app.
2. Navigate to where you have saved the Python IVEN2.0 files, using the cd command.
3. Type .\iven-venv\Scripts\activate to activate the virtual environment you created previously.
4. Type py display\_final\_fig.py to display the final results in an interactive plot. A file window will open, select the ‘**IVEN2out\_....csv**’ file.   
   Press enter to close the figure when you are finished.
5. Run your next analysis/figure displaying or type deactivate, press enter and close the cmd.