Installing Python, Numpy, pillow and Biopython

Go to Windows Search and type cmd

A screenshot of a computer

Description automatically generated

Type Python and hit return

A screenshot of a computer

Description automatically generated

That should take you to the Windows App store, click download. If it doesn’t, type Windows App store and then type Python in the search box.

Go back to your Command Prompt and type the following:

pip install Pillow numpy

Then once that is done, type and hit return:

pip install Biopython

You should now be good to go with Python, so find your worm.py file in the Wormbuddies help folder. Move it to your user file (C:\Users\\*\*yourname\*\*\) by copying and pasting it. My folder is C:\Users\Drmat, for example.

Now find your Python install folder (most likely C:\Python312 or similar) and make two new folders “images” and “reports”. The locations of those should be something like C:\Python312\images and C:\Python\reports. You can also make these folders anywhere you like (eg. your Pictures or Work folder), all that matters is that the location in the worm.py script is correct, the name of the folders on your harddrive and in the script match and the file extension (.jpg, .jpeg or .tif) of your images is correct in the script.

Add your images to be analysed to the Python312\images folder. Don’t forget to remove these images after you run your analysis or they’ll be included in the next analysis.

Now you need to edit the worm.py script. Open the file using Notepad. You have to change three things: the location where Python looks for the images and where it puts the output report, the image file extension that Python is looking for and finally the resolution of the images it is analysing.

1. First let’s add the correct path for finding your images and writing the report file. They should match in worm.py and your hard drive. Make sure you use the back slash as well:

path\_to\_images = r"**\Python312\images**\\*.tif"

path\_to\_report = r"\**Python312\reports**\report.txt"

1. Then we need to make sure the image file extension listed in your worm.py script is the same as the one at the end of your image files. Hover your cursor over the image and it will be either xxx.jpg or xxx.tif. Open worm.py and make sure this part has the correct file extension:

A computer code with text

Description automatically generated

If you’re using .jpg files and it says .tif, change it to \*.jpg (or vice versa). Note that you can also save files as .jpg and .jpeg. It doesn’t matter which you have, as long as the script and the file extension match.

1. Finally we need to make sure that the resolution of the images you’re using matches the resolution in worm.py. Hover your cursor over the image file again and it should show two numbers like so \*\*\*\*x\*\*\*\*. Those numbers need to be the same here:

A computer screen shot of a computer code

Description automatically generated

And here:

A computer code with numbers and text

Description automatically generated

That will ensure that the values Python gives you for mean brightness are correct.

Save the changes to your worm.py file and try running your script in Python.

You can run your analysis in one of two ways.

1. Open up the Command Prompt (cmd) and type:

python worm.py

A black and white screen with white text

Description automatically generated

1. Find your worm.py file in your C:\Users\\*\*yourname\*\* location. Right click on it and select “open with”, then select “Python 3.12”

A screenshot of a computer

Description automatically generated

If nothing happens and you get this:

A black rectangular object with a white border

Description automatically generated

That means that something in the script doesn’t match the file location, extension or size. Go back and double check your scripts.

If everything works properly, it should look something like this:

A screenshot of a computer

Description automatically generated

And it will continue doing that until all the images in the C:\Python312\images folder are analysed. It will then generate a report in the C:\Python312\reports folder, which can be opened as a .txt file. You want the third numerical column (mean brightness) shown below – you can copy and past this into Excel:

A close-up of numbers

Description automatically generated