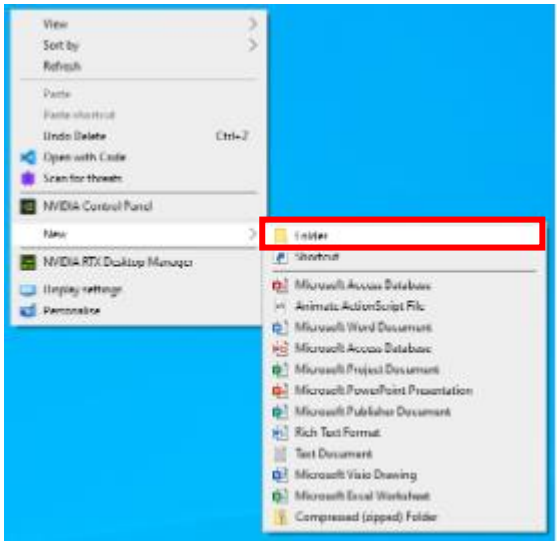
Work Experience setup on Lab Computers

You will need to install and setup the software to run the code and the Neural Network (NN) model you will be using. Please follow these steps:

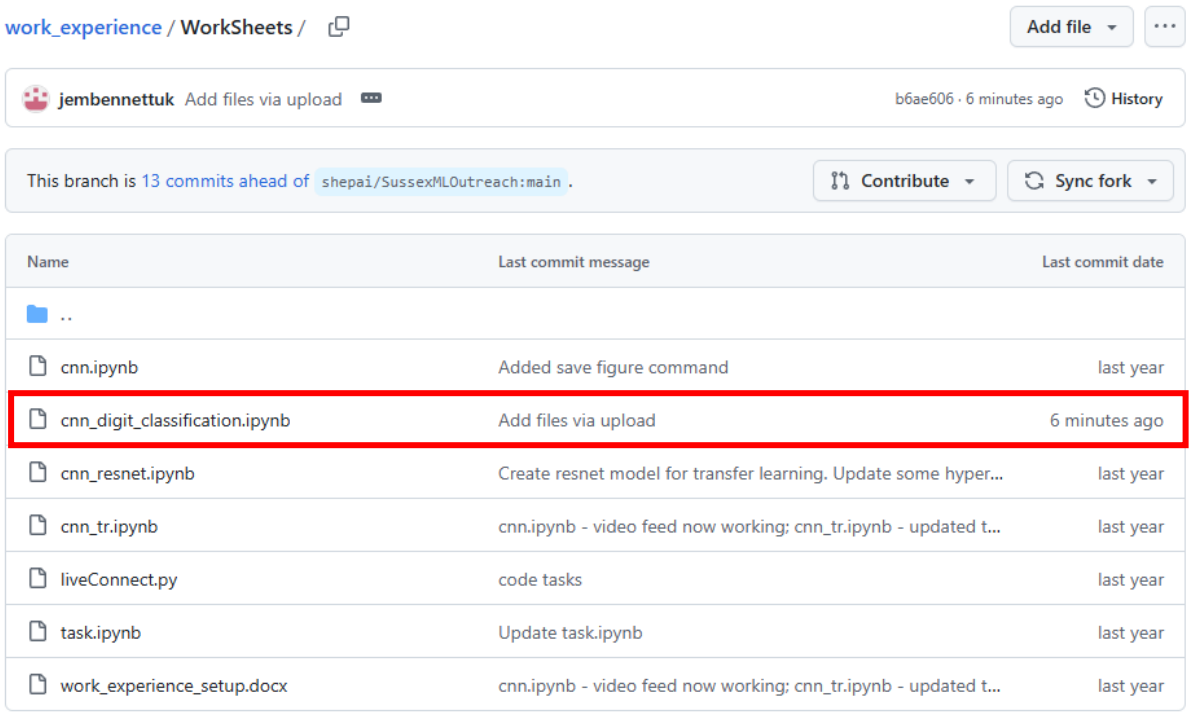
1. On your computer's Desktop, right-click with the mouse and create a new folder. Give the folder the name "work_experience". This will be the directory in which you keep all of your project's files.



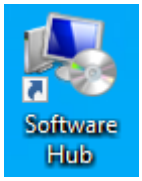
2. You will need to download the digital notebooks that you will be using throughout the next two days. Open a web browser and go to:

   https://github.com/jembennettuk/work_experience/tree/main/WorkSheets

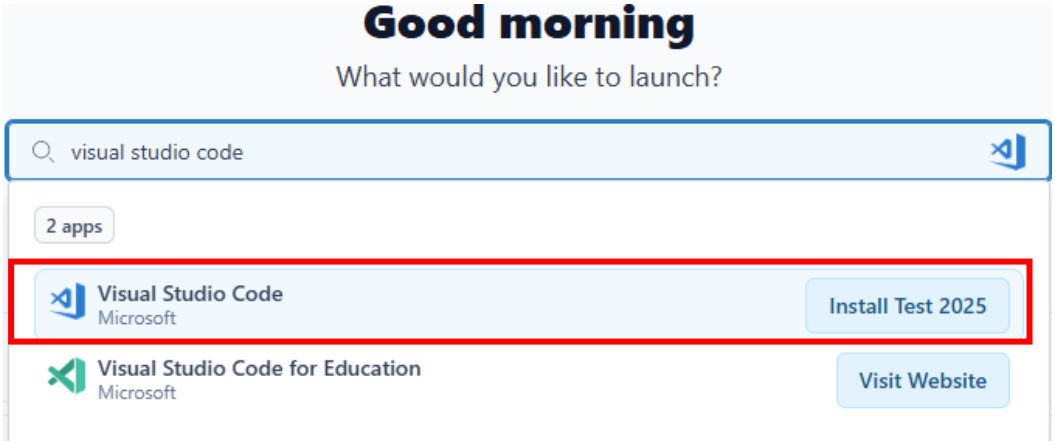
   Here, you can download the Jupyter Notebook called cnn_digit_classification.ipynb:



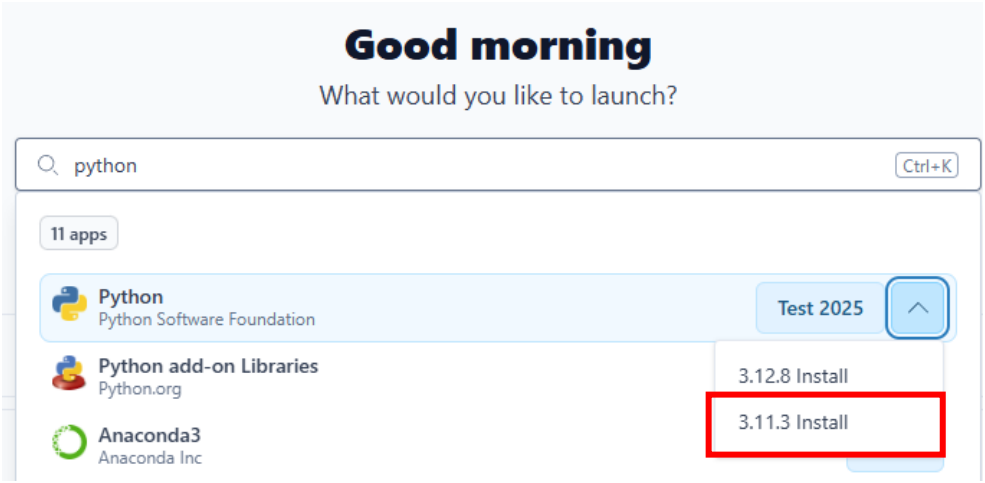
2. On the Desktop, open the Software Hub link:



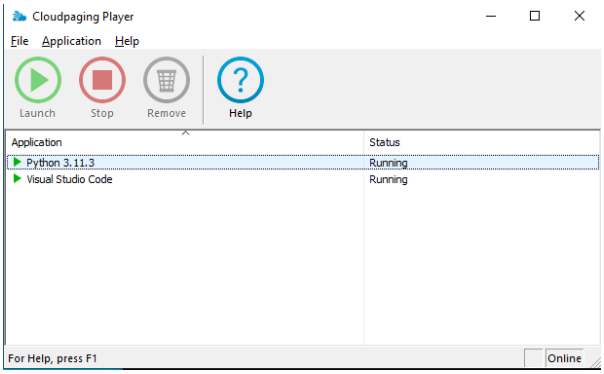
3. Install Visual Studio Code: In the search bar, write Visual Studio Code. Click “Install” for the first option that appears.



4. Install Python 3:
   a. In Software Hub, search for Python, and install Python 3.11.3.

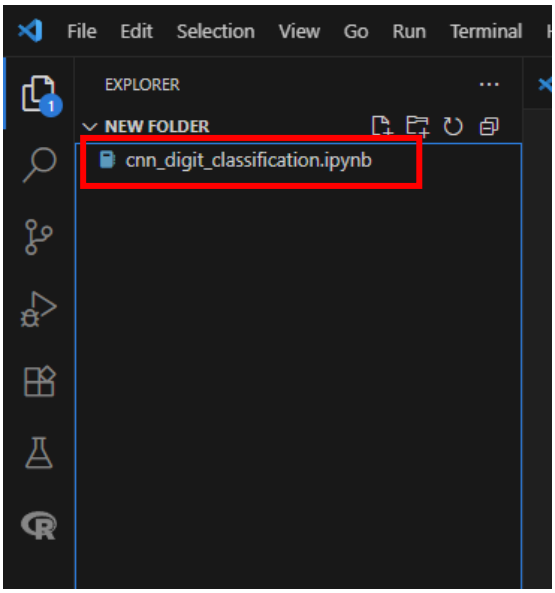


   b. A new window should pop up, and a message to confirm that that Python can be launched through the start menu.



5. Open Visual Studio Code (VSCode). Select “File > Open Folder”, and open the folder you created earlier for Lab files.

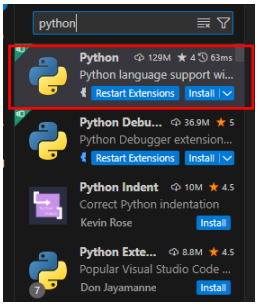
6. On the left hand side of the window, you will see a list of the files in your folder. Click on the cnn_digit_classification.ipynb file to open it:



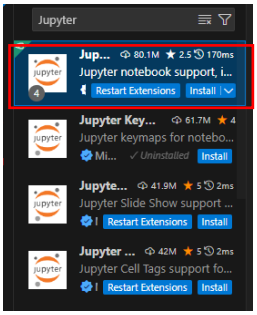
7. In VSCode, you will need to install some extensions and other packages.

   a. Click on this icon in the top left of the window: 

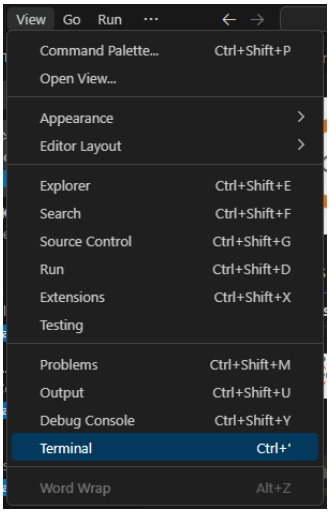
   b. In the search bar, type “Python” and for the top option, click install:



   c. Search for “Jupyter” and install the top option:



   d. In the toolbar at the top of the window, Click on “View” then “Terminal”:



e. This will open a small sub-window at the bottom. This provides a command line interface (CLI), i.e. an interface with which you can type and execute simple commands without the need of a graphical user interface (GUI). First, change to the directory in which the Python executable is located. In the command line, type the following command and hit Enter to execute it:

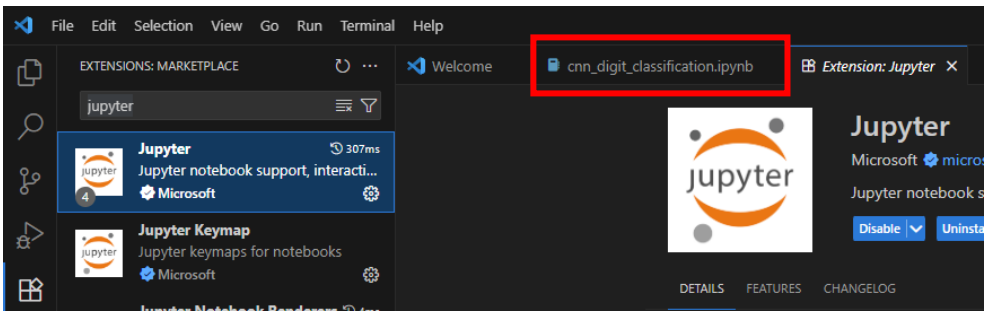
```
cd '~\..\..\Program Files\PythonXXX\'
```

where XXX represents the version of Python you have installed. E.g. if you have installed version 3.11, then XXX will be 311.

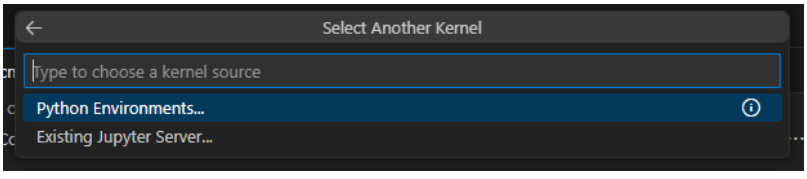
Then execute the following command in the Command Line:

```
.\python.exe -m pip install ipykernel
```

f. Go back to the "cnn_digit_classification.ipynnb" file you opened earlier. You can select it from a tab at the top of the screen:

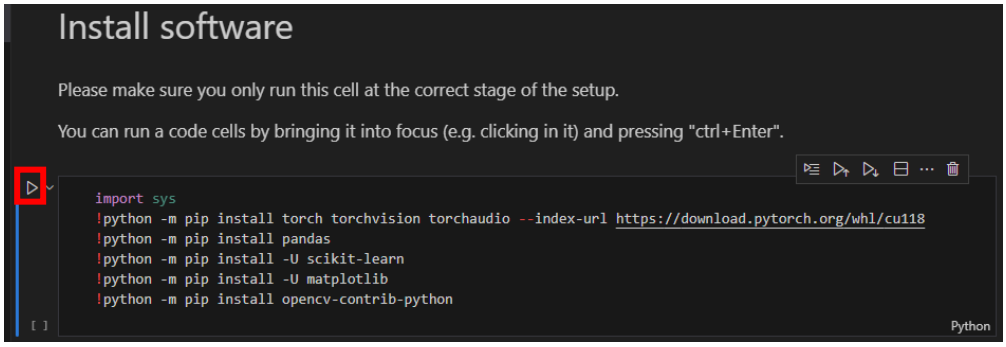


g. You now need to start up a Python kernel so that you can execute code in the notebook. You will be able to select this kernel for any ipynb file you want to work with in the future. In the top right of the window, click on the tab with this icon  . A popup in the centre of the window will appear:



Select "Python Environments..." and then select "Python 3.11.3".

h. You should now be able to run the first cell of the notebook, which will install several more packages. To run this code cell, bring it into focus (click in the cell, and a blue bar will appear to the left to show it has focus:



When focus has been achieved, press “ctrl+Enter” on your keyboard (or click on the small  symbol) to run the cell. The packages being installed are:

i. PyTorch – a library of very useful tools for building NNs and for deep learning
ii. Pandas – a library for handling tabulated data.
iii. Scikit-learn – a library with a wide variety of useful machine learning tools
iv. Matplotlib – a library of plotting tools so that you can visualise the data and results of your experiments.
v. OpenCV – a library for very efficient processing of images and video.

i. That’s it! You’re now ready to work through the Notebook and start training your Convolutional Neural Network!