Packages Necessary to Run the Demo File

- numpy
- matplotlib.pyplot
- scipy.ndimage → specifically shift and rotate
- pickle

Files Within This Folder

- **Answer File** → *1 Sriram Raghav MNIST Visualization Black.py*
    - This file holds the code necessary to display the misclassified images and state its correct classification.
- **Demo File** → *DEMO BLACK.PY*
- **Training set** → *mnist_train.csv*
- **Test set** → *mnist_test.csv*
- **Instructions File** → *Instructions for MNIST Visualization BLACK.pdf (this file)*

Instructions for Running the Answer Code

Preliminary Steps

- Ensure that the VScode terminal is **within this folder** before running the Demo File.
- Download the packages shown above, if not already installed.

How to use the Demo File

- Select the **run button** that looks like a triangle (at the top left corner) to run the Demo File
- The code should run **independently**
- Wait for the code to run through its epochs and start display (it takes around 3 minutes per epoch)
    - It will print the epoch number right after it finishes with that epoch
- After the code is done with the epochs, it will go through the misclassified points and **display the images** for them.
- The **title of the image** will be “Correct Classification: {classification}” where “classification” refers to the **correct classification** of the image that was misclassified. Additionally, the correct classification will also appear in the terminal.
- Images will display **one at a time** and the next image will be displayed once the previous image has been closed (with a one second delay).
    - Close the current image in order to display the next image.
- You can **stop** the images from continuing to run at any time by closing the terminal.