This program can be run in PyCharm using the Python 3.11 interpreter. Run the program using shift+F10.

To start, I loaded in the required files ‘MNIST\_training.csv’ and ‘MNIST\_test.csv’ into train\_data and test\_data panda data frames. Then I removed the column headers and converted the pixel data to integers so we could use the data for calculations. Then I proceeded to separate the labels and pixel data from each set so that I could use them to input into my KNN function. For KNN, I defined a KNN function that takes text\_pixels, train\_pixels, train\_labels, and a K value (default set to 3). This function iterates through each MNIST image and calculates the Euclidean Distance to all training images. After calculating the distance, I took the nearest indices and used it to find the nearest labels, which I then used to find the majority label and make a prediction. Finally, I printed the predicted labels, correctly identified predictions, incorrectly identified predictions and calculated the accuracy K=7.

