The python file named "owndata.py" consists of the code which designs the 2D convolutional neural networks. Our project is focused on recognizing handwritten digits that are drawn on the canvas. For this project, we took 60000 images from the MNIST dataset. On top of that, we create our own 217 images to train the network. They are all included in the zip file of the project.

We used epoch = 24, batch size = 256, Adadelta as optimizer and activation as softmax.

To run this application, we need to start the training process. We should run the program "owndata.py" first. This will train the 60,217 images and stores the information of training data and test data on the file named "CNN2.h5" which is also included in a zip file. The training process should approximately 10 minutes. After the completion of this file, the test accuracy and total losses are shown on the console.

The next file for this project is named as "gg.py" which has GUI to test out our network. There is a Canvas where we can draw any specific shape. When the numbers are drawn on Canvas and when the recognize button is clicked. The image of Canvas along with the drawn digit is snapped and passed to "predict_digit" method. This method converts the image to grayscale and reshapes so that it can be checked on the module in order to predict the number. Using the method from the module it returns the predicted digit which is then displayed as a label. The images that we created in the directory "msit/data/train1" and "msit/data/validation1". We also have "clear" button which resets the Canvas for other entries.