Guided Project Report

Handwritten Digit Recognition

Name: Shruti Verma
Course: AI and ML
(Batch 4)
Duration: 10 months

Problem Statement: Implement the classifier by squeezing the image into a vector and then using a MLP and SVM

Prerequisites

What things you need to install the software and how to install them:

Python 3.8 or higher versions This setup requires that your machine has latest version of python. The following url https://www.python.org/downloads/ can be referred to download python. Once you have python downloaded and installed, you will need to setup PATH variables (if you want to run python program directly, detail instructions are below in how to run software section). To do that check this: https://www.pythoncentral.io/add-python-to-path-python-is-not- recognized-as-an-internal-or-external- command/. Setting up PATH variable is optional as you can also run program without it and more instruction are given below on this topic.

Second and easier option is to download anaconda and use its anaconda prompt to run the commands. To install anaconda check this url https://www.anaconda.com/download/ You will also need to download and install below 3 packages after you install either python or anaconda from the steps above Sklearn (scikit-learn) numpy scipy if you have chosen to install python 3.8 then run below commands in command prompt/terminal to install these packages pip install -U scikit-learn pip install numpy pip install scipy if you have chosen to install anaconda then run below commands in anaconda prompt to install these packages conda install -c scikit-learn conda install -c anaconda numpy conda install -c anaconda scipy . Install the keras and sklearn.svm import SVC .

Video Link

https://drive.google.com/drive/folders/1nKjHKic6ZATLwmXNwcyb1Guxb1LNOrrO

Dataset used

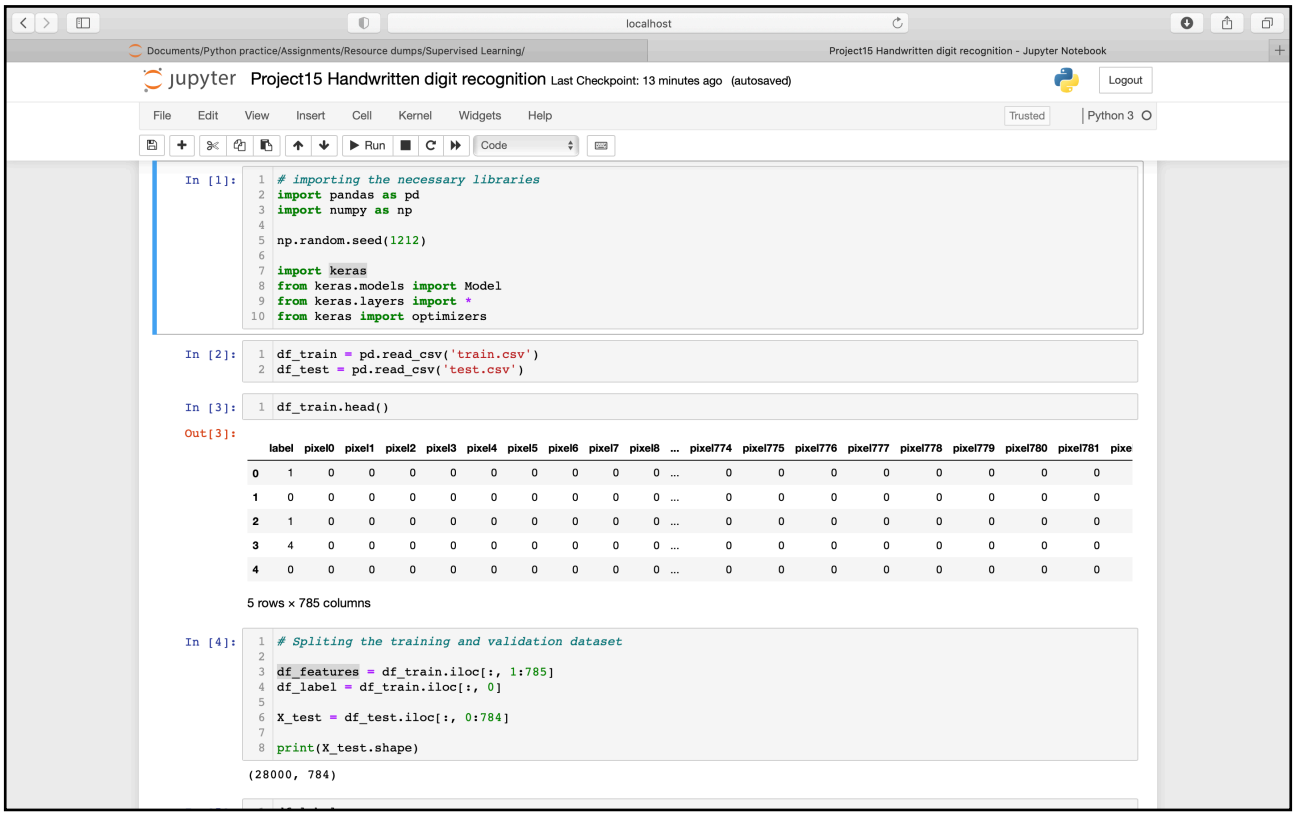
Using the MNIST dataset, training set of 60,000 examples and test set of 10,000 examples.

Method used for detection

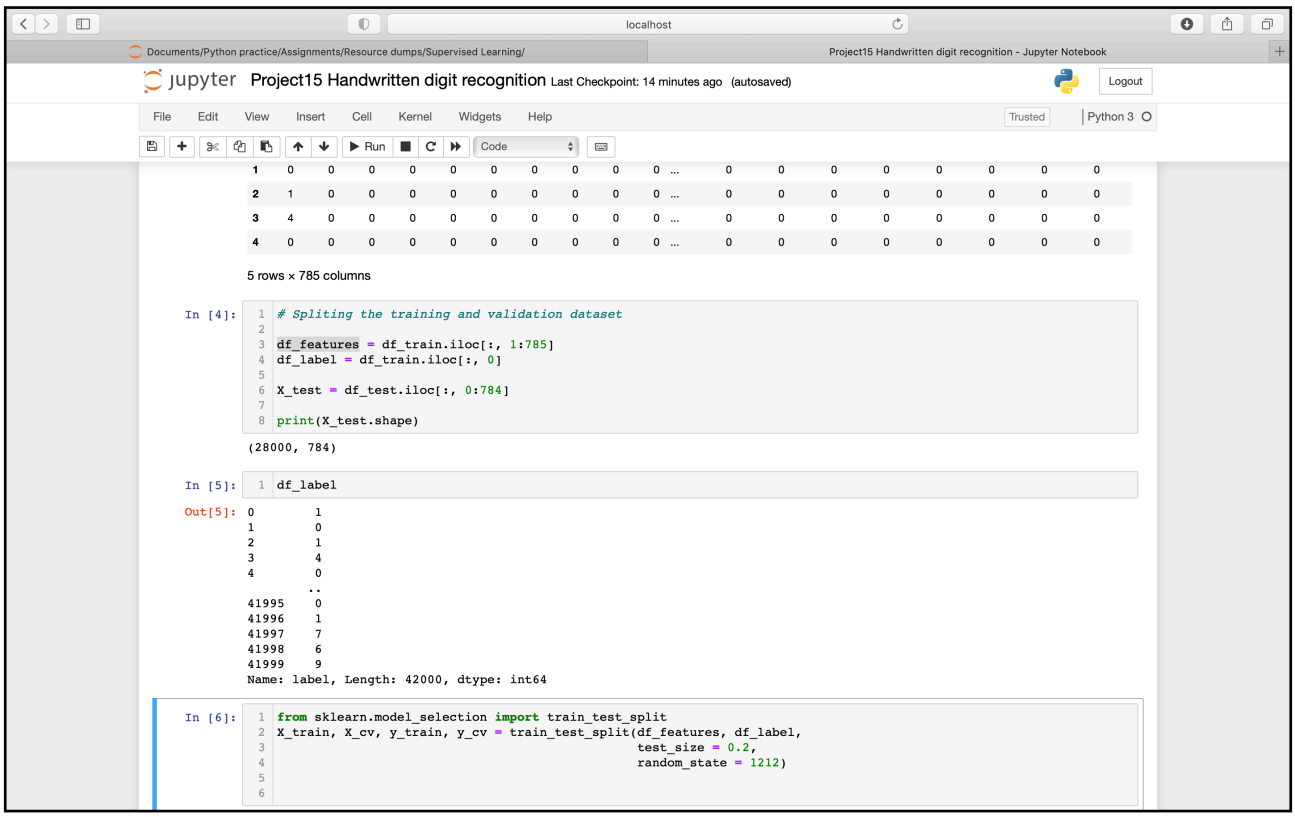
- Reading the dataset, squeezing the image
- Coverting to vector
- Applying model

Importing the libraries and capturing images:

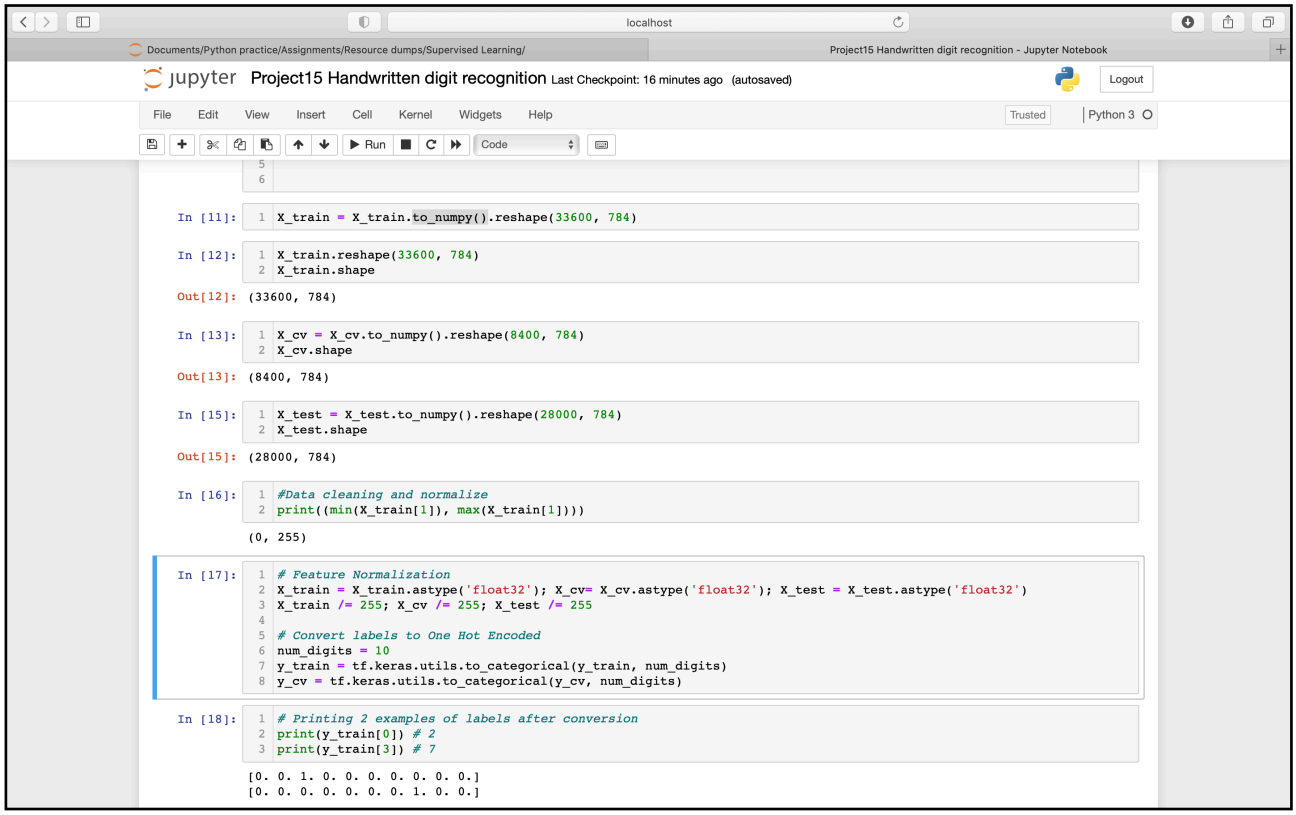
Importing the necessary libraries and reading the MNIST train and test data



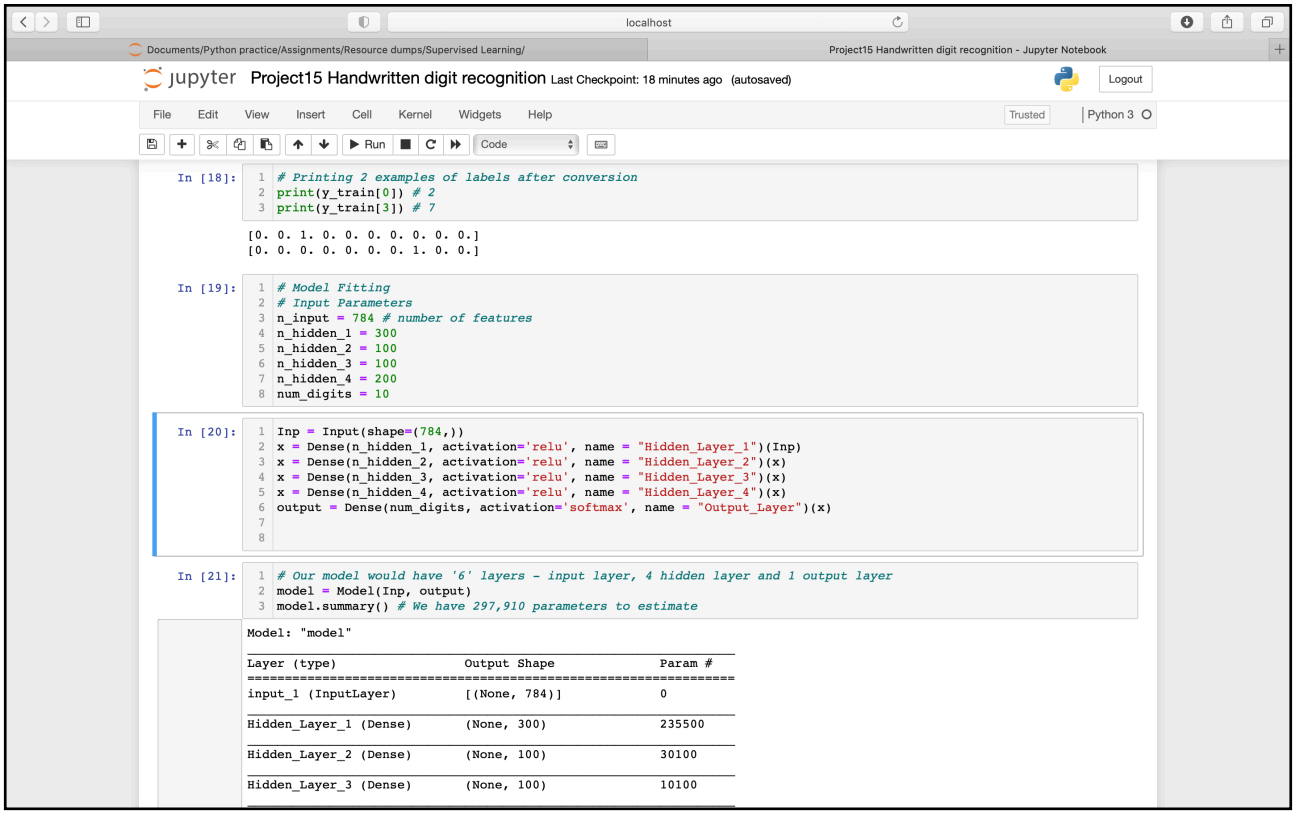
Splitting the data into train and test and checking the labels and features



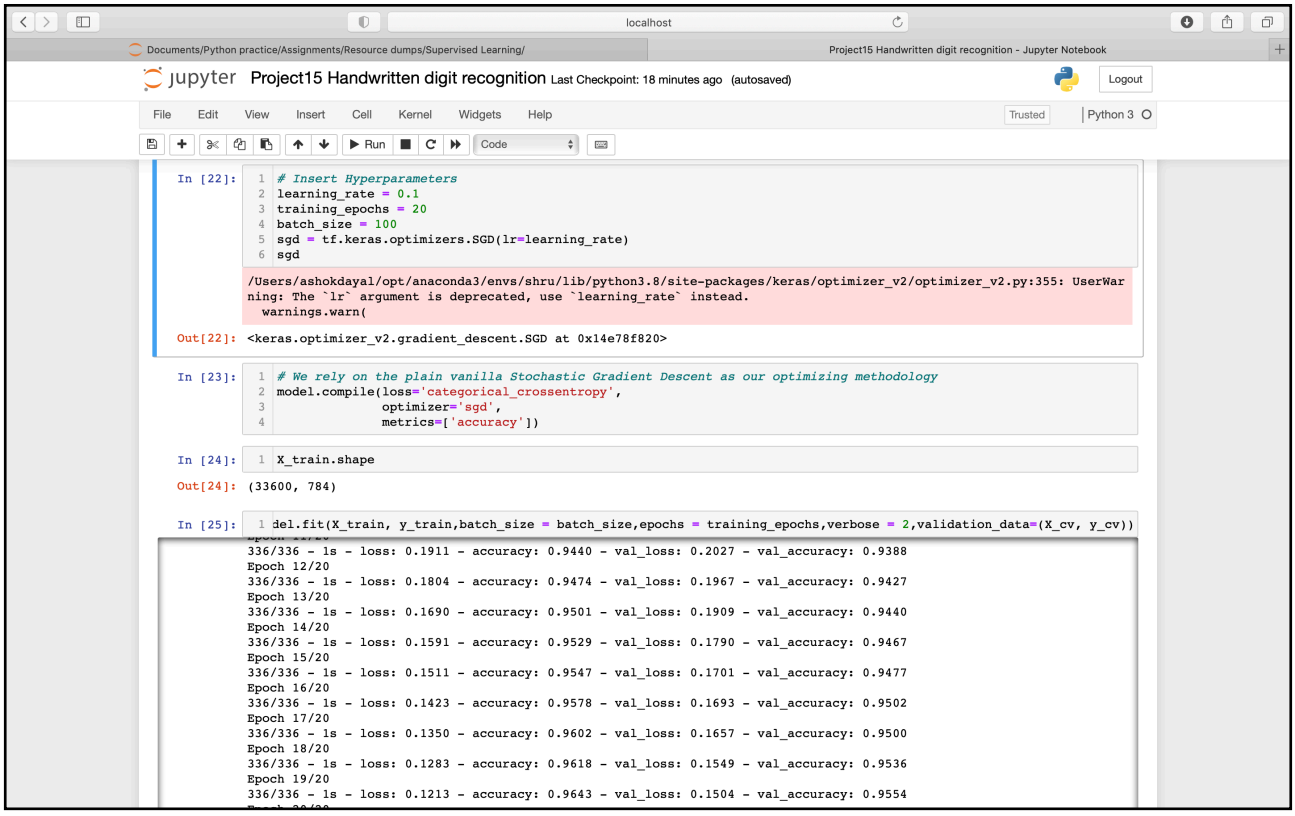
Data processing and using one hot encoder for labels



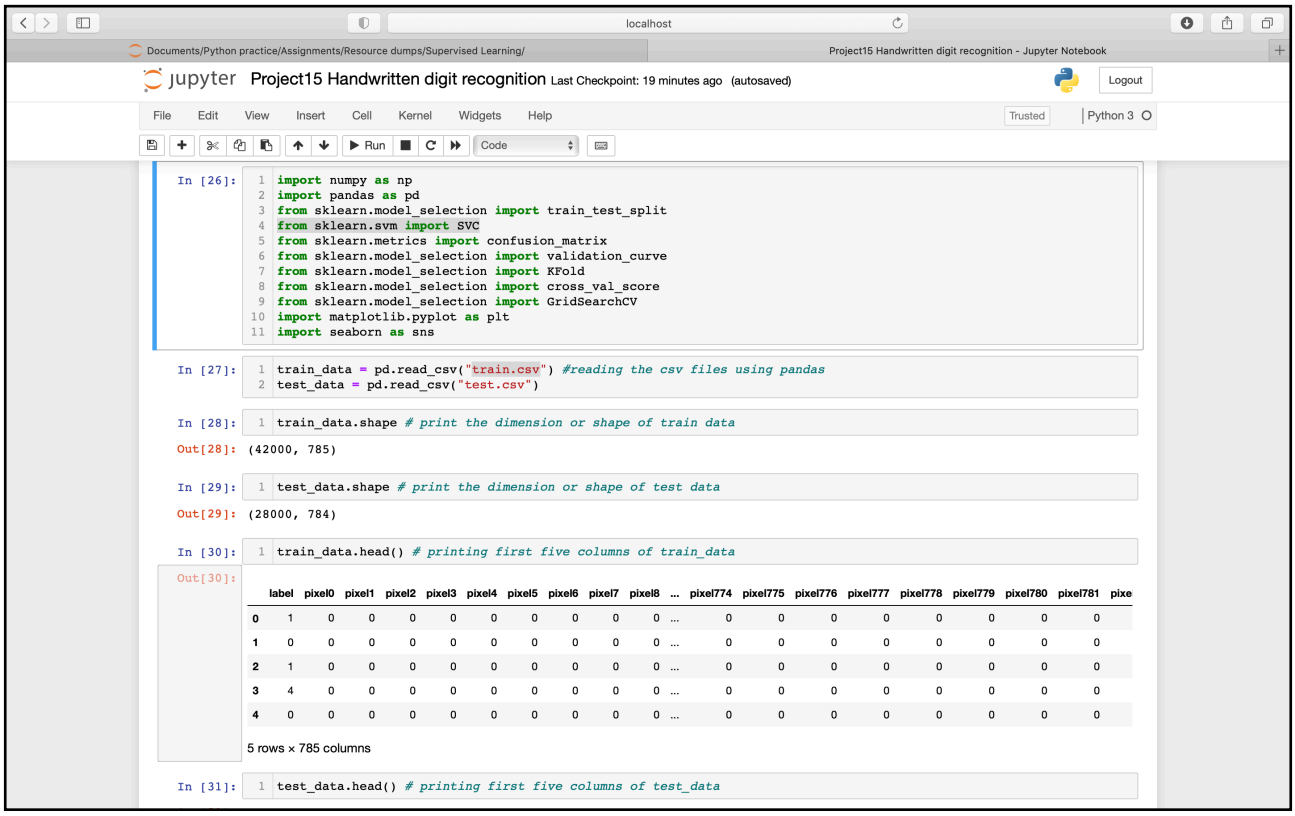
Model Fitting



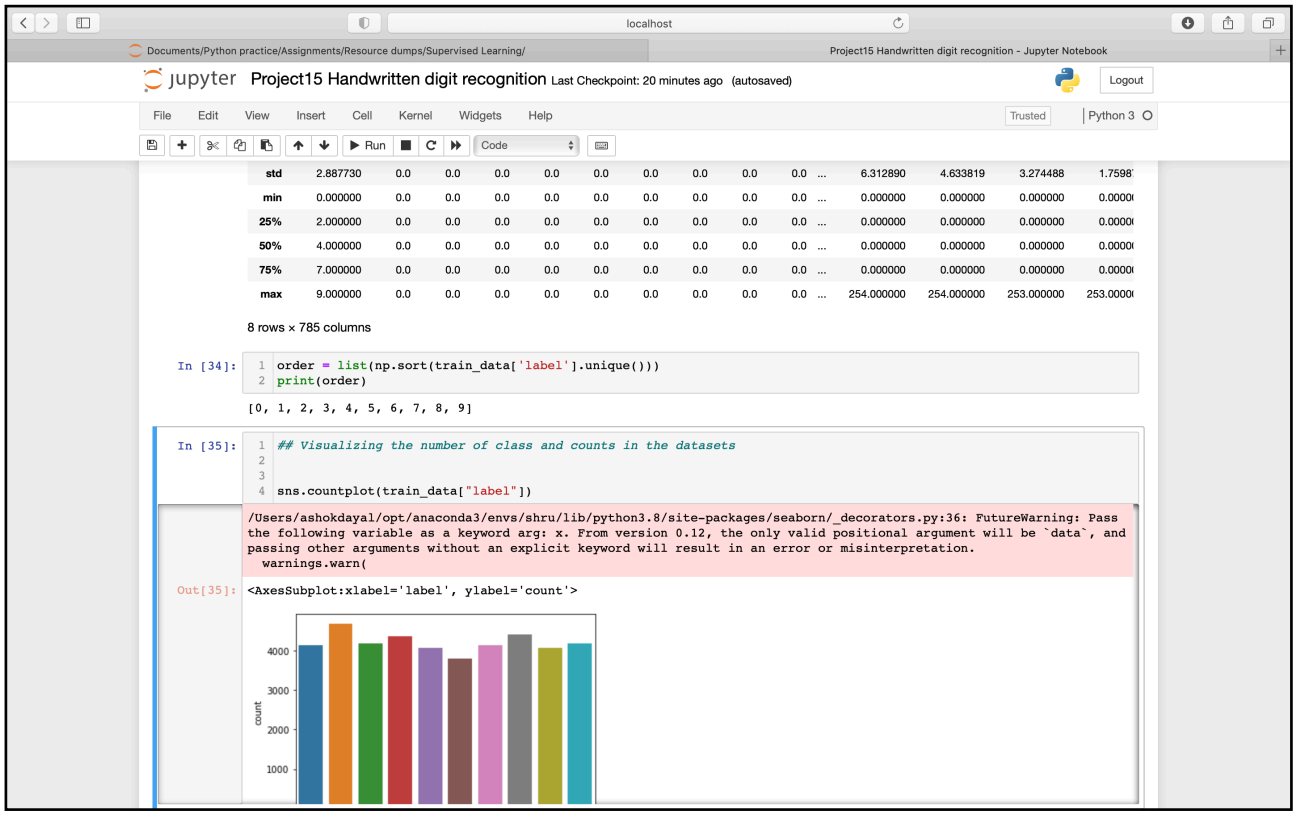
Checking the loss and accuracy of the model

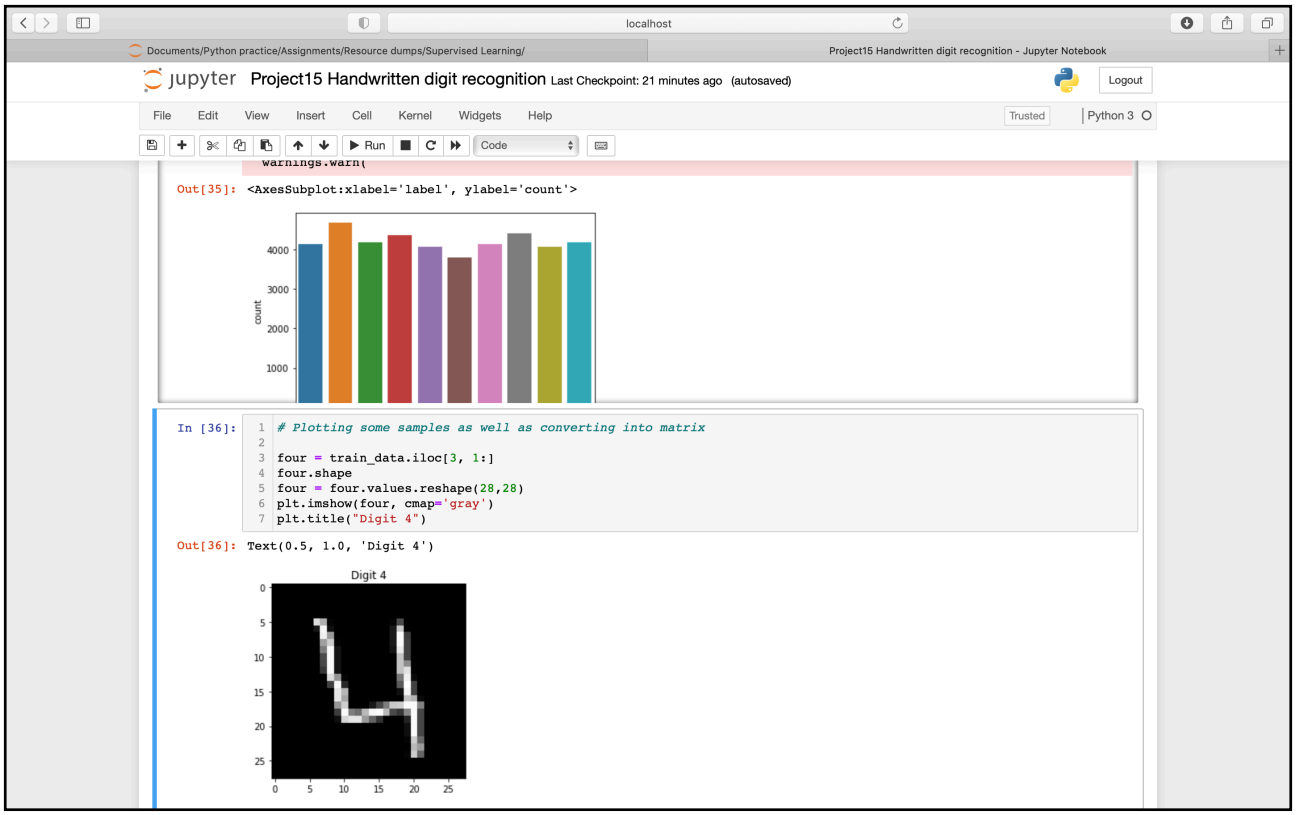


Using SVC to check the performance difference

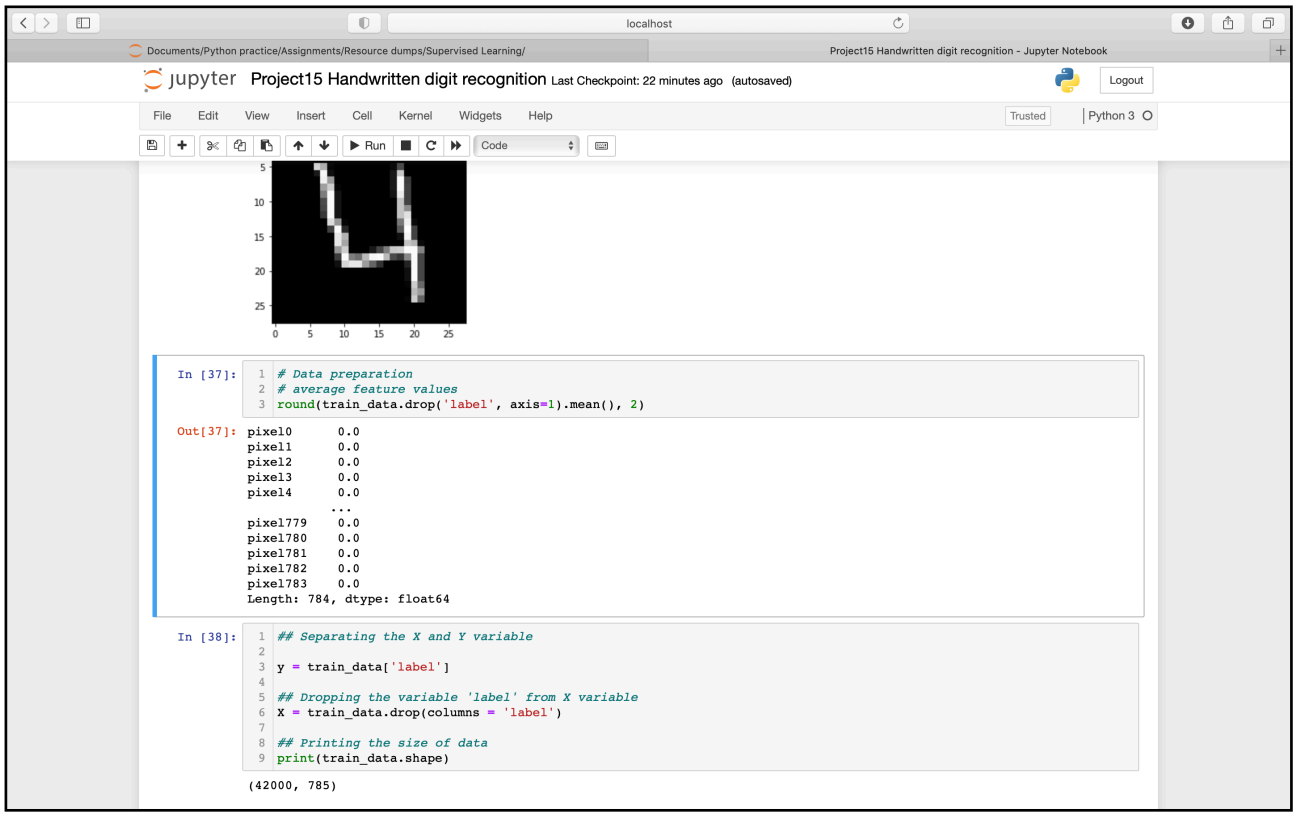


Visual for number count and number of classes, covering to matrix





Data Preparation



Model Fitting