CS440 MP 3

**Part 1: Digit classification**

**Digit classification** part of MP3 was implemented with Python 3.

**Reading the Data**

In our implementation, each entry from **training** or **test data** are converted to 28x28 matrix of 1s and 0s. Empty spaces are converted to 0 and every other element is converted to 1.

Let be a 28x28 matrix (with entries 0 and 1) representing an entry from the training data, where .

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**Training**

, , and are computed in equation 1 ,2 and 3, respectively.

Let be a 28x28 matrix where

**[1]**

Wherethe **Number of training data = 5000** and . Ones(28,28) is a 28x28 matrix where all the entries are 1.

**[3]**

**Identifying the image**

is identified as digit z:

**[4]**

**[5]**(Likelihood =digit x)

**Results:**

Laplacian smoothing factor, **k =5**, was used.

C:\Users\Mergen\AppData\Local\Microsoft\Windows\INetCache\Content.Word\correct classification rate.png









