MNIST hand-written digit classification

5	0	Ч	7	9	2	1	3
000000-num5.p	000001-num0.p	000002-num4.p	000003-num1.p	000004-num9.p	000005-num2.p	000006-num1.p	000007-num3.p
ng							
1	4	3	5	3	6	1	7
000008-num1.p	000009-num4.p	000010-num3.p	000011-num5.p	000012-num3.p	000013-num6.p	000014-num1.p	000015-num7.p
ng							
2	8	6	9	ч	0	9	/
000016-num2.p	000017-num8.p	000018-num6.p	000019-num9.p	000020-num4.p	000021-num0.p	000022-num9.p	000023-num1.p
ng							
1	2	4	3	2	7	3	8
000024-num1.p	000025-num2.p	000026-num4.p	000027-num3.p	000028-num2.p	000029-num7.p	000030-num3.p	000031-num8.p
ng							
6	9	0	5	6	0	7	6
000032-num6.p	000033-num9.p	000034-num0.p	000035-num5.p	000036-num6.p	000037-num0.p	000038-num7.p	000039-num6.p
ng							
1	8	7	9	3	9	8	5
000040-num1.p	000041-num8.p	000042-num7.p	000043-num9.p	000044-num3.p	000045-num9.p	000046-num8.p	000047-num5.p
ng							
9	3	3	0	7	4	9	8

Digit range from 0~9, training set consist of 60000 images, and test set consist of 10000 images.

Task 1: One layer SoftMax Classifier

The Forward Pass of SoftMax Classifier

Compute Class scores

$$y_i = Wx_i + b$$

Use SoftMax to convert from scores to probs

$$p_{i,j} = rac{e^{y_{i,j}}}{\sum_k e^{y_{i,k}}}$$

You should be able to get a test accuary higher than 80%

In []:

Task 2: Two Layer neural network

The Forward Pass of a Two layer neural network

Input Layer to Hidden Layer

$$h_i = act(W_{(1)}x_i + b_{(1)})$$

Hidden Layer to Output Layer

$$y_i = W_{(2)} h_i + b_{(2)}$$

Then convert the score to softmax

You should be able to get a test accuary higher than 95%							
In [].							