The report. Exercise 1.

Question 1:



Z2 = np.dot(X, W1) + b1

A2 = np.maximum(0, Z2) #<- this is ReLU

Z3 = np.dot(A2, W2) + b2

Then we tried writing softmax as

scores = np.exp(Z3) / np.sum(np.exp(Z3))

But it did not work properly, so we used:

scores = Z3.copy()

for i in range(len(Z3)):

for j in range(len(Z3[i])):

scores[i][j] = np.exp(Z3[i][j]) / np.sum(np.exp(Z3[i]))



Firstly we take only probabilities of correct class

probs\_of\_correct\_class = [scores[i][y[i]] for i in range(len(scores))]

Then we compute the loss:

loss = 1/N \* np.sum(-np.log(probs\_of\_correct\_class)) + reg\*(np.linalg.norm(W1)\*\*2 + np.linalg.norm(W2)\*\*2)

(c)We replaced the softmax loop for this:

e\_x = np.exp(Z3 - np.max(Z3, axis=1, keepdims=True))

scores = e\_x / np.sum(e\_x, axis=1, keepdims=True)