Second obligatory assignment - hib003, dbj001

We tried to experiment with different learning rates and batch sizes to better understand the parameters and get the highest possible accuracy for our model. So here are some screenshots of results with different parameters:

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epoch: 1 | Correct predictions: 45218 | Total loss: 765.11 | Accuracy: 0.75 | learning rate= 0.01 | batch_size 50
epoch: 2 | Correct predictions: 49463 | Total loss: 566.85 | Accuracy: 0.82 | learning rate= 0.01 | batch_size 50
epoch: 3 | Correct predictions: 50208 | Total loss: 528.41 | Accuracy: 0.84 | learning rate= 0.01 | batch_size 50
epoch: 4 | Correct predictions: 50606 | Total loss: 507.29 | Accuracy: 0.84 | learning rate= 0.01 | batch_size 50
epoch: 5 | Correct predictions: 50910 | Total loss: 496.09 | Accuracy: 0.85 | learning rate= 0.01 | batch_size 50

epoch: 1 | Correct predictions: 45648 | Total loss: 1188.21 | Accuracy: 0.76 | learning rate= 0.001 | batch_size 32
epoch: 2 | Correct predictions: 50768 | Total loss: 791.9 | Accuracy: 0.85 | learning rate= 0.001 | batch_size 32
epoch: 3 | Correct predictions: 51958 | Total loss: 692.28 | Accuracy: 0.87 | learning rate= 0.001 | batch_size 32
epoch: 4 | Correct predictions: 52477 | Total loss: 634.25 | Accuracy: 0.87 | learning rate= 0.001 | batch_size 32
epoch: 5 | Correct predictions: 52976 | Total loss: 592.98 | Accuracy: 0.88 | learning rate= 0.001 | batch_size 32

epoch: 1 | Correct predictions: 46752 | Total loss: 3496.96 | Accuracy: 0.78 | learning rate= 0.001 | batch_size 10
epoch: 2 | Correct predictions: 51247 | Total loss: 2368.92 | Accuracy: 0.85 | learning rate= 0.001 | batch_size 10
epoch: 3 | Correct predictions: 52333 | Total loss: 2051.92 | Accuracy: 0.87 | learning rate= 0.001 | batch_size 10
epoch: 4 | Correct predictions: 53055 | Total loss: 1870.17 | Accuracy: 0.88 | learning rate= 0.001 | batch_size 10
epoch: 5 | Correct predictions: 53460 | Total loss: 1759.1 | Accuracy: 0.89 | learning rate= 0.001 | batch_size 10
```

What our training epochs are showing is a clear improvement of accuracy with lower learning rates and batch sizes, which is not very surprising. The issue is more with how time consuming running the epochs becomes, and although we got more correct predictions on the last run, it also took us a lot longer time.

Access to the network model:
https://drive.google.com/drive/folders/10jD_xBCLvGehfadpJkrH99SmzoVnUvk0?usp=sharing