springsteen {~/Windows/Profile/CSE574} > python cnnScript.py

Extracting data/MNIST/train-images-idx3-ubyte.gz

Extracting data/MNIST/train-labels-idx1-ubyte.gz

Extracting data/MNIST/t10k-images-idx3-ubyte.gz

Extracting data/MNIST/t10k-labels-idx1-ubyte.gz

Size of:

- Training-set: 55000

- Test-set: 10000

- Validation-set: 5000

Accuracy on Test-Set: 7.9% (789 / 10000)

Optimization Iteration: 1, Training Accuracy: 6.2%

Time usage: 0:00:00

Accuracy on Test-Set: 7.5% (746 / 10000)

Example errors:

Confusion Matrix:

[[ 0 0 0 29 7 0 0 2 462 480]

[ 0 0 0 0 614 0 0 1 484 36]

[ 0 0 0 37 225 0 0 65 258 447]

[ 0 0 0 1 104 0 0 1 21 883]

[ 0 0 0 15 56 0 0 11 488 412]

[ 0 0 0 1 81 0 0 1 376 433]

[ 0 0 0 1 111 0 0 15 508 323]

[ 0 0 0 19 115 0 0 3 180 711]

[ 0 0 0 3 126 0 0 1 107 737]

[ 0 0 0 14 93 0 0 16 307 579]]

Time usage: 0:00:10

Accuracy on Test-Set: 69.0% (6901 / 10000)

Example errors:

Confusion Matrix:

[[ 951 1 0 15 3 0 8 0 2 0]

[ 0 1099 12 4 1 0 3 0 4 12]

[ 64 31 745 108 27 0 30 18 4 5]

[ 15 26 28 862 4 0 0 8 5 62]

[ 9 7 3 0 866 0 14 0 0 83]

[ 149 47 5 340 134 77 6 2 86 46]

[ 138 59 1 4 39 0 712 0 3 2]

[ 17 54 36 6 18 0 0 513 1 383]

[ 68 91 17 188 74 0 6 6 321 203]

[ 30 14 0 15 190 0 2 2 1 755]]

Optimization Iteration: 101, Training Accuracy: 75.0%

Optimization Iteration: 201, Training Accuracy: 76.6%

Optimization Iteration: 301, Training Accuracy: 76.6%

Optimization Iteration: 401, Training Accuracy: 85.9%

Optimization Iteration: 501, Training Accuracy: 87.5%

Optimization Iteration: 601, Training Accuracy: 96.9%

Optimization Iteration: 701, Training Accuracy: 90.6%

Optimization Iteration: 801, Training Accuracy: 90.6%

Optimization Iteration: 901, Training Accuracy: 93.8%

Time usage: 0:01:11

Accuracy on Test-Set: 92.9% (9291 / 10000)

Example errors:

Confusion Matrix:

[[ 956 0 3 1 0 3 14 1 2 0]

[ 0 1115 3 2 1 1 4 0 9 0]

[ 11 2 934 19 13 2 15 17 17 2]

[ 1 1 15 937 0 22 1 16 8 9]

[ 0 2 3 0 906 0 18 1 3 49]

[ 6 1 3 21 6 820 20 3 7 5]

[ 8 3 2 0 7 14 922 1 1 0]

[ 1 10 26 6 4 1 1 925 0 54]

[ 8 7 6 29 14 22 10 12 839 27]

[ 9 5 7 10 17 7 0 14 3 937]]

Optimization Iteration: 1001, Training Accuracy: 89.1%

Optimization Iteration: 1101, Training Accuracy: 90.6%

Optimization Iteration: 1201, Training Accuracy: 92.2%

Optimization Iteration: 1301, Training Accuracy: 92.2%

Optimization Iteration: 1401, Training Accuracy: 93.8%

Optimization Iteration: 1501, Training Accuracy: 95.3%

Optimization Iteration: 1601, Training Accuracy: 89.1%

Optimization Iteration: 1701, Training Accuracy: 93.8%

Optimization Iteration: 1801, Training Accuracy: 93.8%

Optimization Iteration: 1901, Training Accuracy: 95.3%

Optimization Iteration: 2001, Training Accuracy: 95.3%

Optimization Iteration: 2101, Training Accuracy: 95.3%

Optimization Iteration: 2201, Training Accuracy: 100.0%

Optimization Iteration: 2301, Training Accuracy: 96.9%

Optimization Iteration: 2401, Training Accuracy: 96.9%

Optimization Iteration: 2501, Training Accuracy: 96.9%

Optimization Iteration: 2601, Training Accuracy: 95.3%

Optimization Iteration: 2701, Training Accuracy: 98.4%

Optimization Iteration: 2801, Training Accuracy: 90.6%

Optimization Iteration: 2901, Training Accuracy: 98.4%

Optimization Iteration: 3001, Training Accuracy: 98.4%

Optimization Iteration: 3101, Training Accuracy: 92.2%

Optimization Iteration: 3201, Training Accuracy: 98.4%

Optimization Iteration: 3301, Training Accuracy: 98.4%

Optimization Iteration: 3401, Training Accuracy: 96.9%

Optimization Iteration: 3501, Training Accuracy: 96.9%

Optimization Iteration: 3601, Training Accuracy: 96.9%

Optimization Iteration: 3701, Training Accuracy: 98.4%

Optimization Iteration: 3801, Training Accuracy: 96.9%

Optimization Iteration: 3901, Training Accuracy: 93.8%

Optimization Iteration: 4001, Training Accuracy: 98.4%

Optimization Iteration: 4101, Training Accuracy: 95.3%

Optimization Iteration: 4201, Training Accuracy: 98.4%

Optimization Iteration: 4301, Training Accuracy: 95.3%

Optimization Iteration: 4401, Training Accuracy: 95.3%

Optimization Iteration: 4501, Training Accuracy: 95.3%

Optimization Iteration: 4601, Training Accuracy: 95.3%

Optimization Iteration: 4701, Training Accuracy: 98.4%

Optimization Iteration: 4801, Training Accuracy: 95.3%

Optimization Iteration: 4901, Training Accuracy: 98.4%

Optimization Iteration: 5001, Training Accuracy: 100.0%

Optimization Iteration: 5101, Training Accuracy: 100.0%

Optimization Iteration: 5201, Training Accuracy: 98.4%

Optimization Iteration: 5301, Training Accuracy: 98.4%

Optimization Iteration: 5401, Training Accuracy: 96.9%

Optimization Iteration: 5501, Training Accuracy: 98.4%

Optimization Iteration: 5601, Training Accuracy: 100.0%

Optimization Iteration: 5701, Training Accuracy: 96.9%

Optimization Iteration: 5801, Training Accuracy: 100.0%

Optimization Iteration: 5901, Training Accuracy: 98.4%

Optimization Iteration: 6001, Training Accuracy: 95.3%

Optimization Iteration: 6101, Training Accuracy: 96.9%

Optimization Iteration: 6201, Training Accuracy: 98.4%

Optimization Iteration: 6301, Training Accuracy: 100.0%

Optimization Iteration: 6401, Training Accuracy: 96.9%

Optimization Iteration: 6501, Training Accuracy: 98.4%

Optimization Iteration: 6601, Training Accuracy: 98.4%

Optimization Iteration: 6701, Training Accuracy: 98.4%

Optimization Iteration: 6801, Training Accuracy: 98.4%

Optimization Iteration: 6901, Training Accuracy: 98.4%

Optimization Iteration: 7001, Training Accuracy: 100.0%

Optimization Iteration: 7101, Training Accuracy: 100.0%

Optimization Iteration: 7201, Training Accuracy: 98.4%

Optimization Iteration: 7301, Training Accuracy: 98.4%

Optimization Iteration: 7401, Training Accuracy: 98.4%

Optimization Iteration: 7501, Training Accuracy: 100.0%

Optimization Iteration: 7601, Training Accuracy: 98.4%

Optimization Iteration: 7701, Training Accuracy: 100.0%

Optimization Iteration: 7801, Training Accuracy: 98.4%

Optimization Iteration: 7901, Training Accuracy: 98.4%

Optimization Iteration: 8001, Training Accuracy: 100.0%

Optimization Iteration: 8101, Training Accuracy: 98.4%

Optimization Iteration: 8201, Training Accuracy: 98.4%

Optimization Iteration: 8301, Training Accuracy: 100.0%

Optimization Iteration: 8401, Training Accuracy: 100.0%

Optimization Iteration: 8501, Training Accuracy: 96.9%

Optimization Iteration: 8601, Training Accuracy: 100.0%

Optimization Iteration: 8701, Training Accuracy: 100.0%

Optimization Iteration: 8801, Training Accuracy: 98.4%

Optimization Iteration: 8901, Training Accuracy: 100.0%

Optimization Iteration: 9001, Training Accuracy: 100.0%

Optimization Iteration: 9101, Training Accuracy: 100.0%

Optimization Iteration: 9201, Training Accuracy: 95.3%

Optimization Iteration: 9301, Training Accuracy: 96.9%

Optimization Iteration: 9401, Training Accuracy: 95.3%

Optimization Iteration: 9501, Training Accuracy: 98.4%

Optimization Iteration: 9601, Training Accuracy: 98.4%

Optimization Iteration: 9701, Training Accuracy: 96.9%

Optimization Iteration: 9801, Training Accuracy: 96.9%

Optimization Iteration: 9901, Training Accuracy: 100.0%

Time usage: 0:15:53

Accuracy on Test-Set: 98.6% (9859 / 10000)

Example errors:

Confusion Matrix:

[[ 964 0 1 0 0 7 3 1 2 2]

[ 0 1132 1 0 0 0 1 1 0 0]

[ 0 3 1023 0 0 0 0 4 2 0]

[ 0 0 0 998 0 7 0 2 1 2]

[ 0 0 1 0 968 0 0 2 0 11]

[ 0 0 0 1 0 890 1 0 0 0]

[ 3 3 1 0 6 10 935 0 0 0]

[ 0 5 4 1 0 0 0 1011 1 6]

[ 1 1 4 4 1 7 0 3 945 8]

[ 0 4 0 3 5 2 0 2 0 993]]