Anaconda Prompt - CPU_MNIST.py

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(base) C:\Users\Mehmet\Desktop\a>CPU_MNIST.py
##### NETWORK 1 #####
Epoch number: 1
[1,  2000] loss: 1.285
[1,  4000] loss: 0.184
[1,  6000] loss: 0.119
[1,  8000] loss: 0.109
[1, 10000] loss: 0.083
[1, 12000] loss: 0.073
Epoch number: 2
[2,  2000] loss: 0.064
[2,  4000] loss: 0.066
[2,  6000] loss: 0.059
[2,  8000] loss: 0.054
[2, 10000] loss: 0.056
[2, 12000] loss: 0.053
Epoch number: 3
[3,  2000] loss: 0.041
[3,  4000] loss: 0.036
[3,  6000] loss: 0.043
[3,  8000] loss: 0.045
[3, 10000] loss: 0.045
[3, 12000] loss: 0.036
Epoch number: 4
[4,  2000] loss: 0.031
[4,  4000] loss: 0.033
[4,  6000] loss: 0.031
[4,  8000] loss: 0.031
[4, 10000] loss: 0.030
[4, 12000] loss: 0.038
Epoch number: 5
[5,  2000] loss: 0.019
[5,  4000] loss: 0.024
[5,  6000] loss: 0.026
[5,  8000] loss: 0.027
[5, 10000] loss: 0.032
[5, 12000] loss: 0.031
Epoch number: 6
[6,  2000] loss: 0.019
[6,  4000] loss: 0.017
[6,  6000] loss: 0.024
[6,  8000] loss: 0.025
[6, 10000] loss: 0.023
[6, 12000] loss: 0.022
Epoch number: 7
[7,  2000] loss: 0.012
[7,  4000] loss: 0.015
[7,  6000] loss: 0.020
[7,  8000] loss: 0.019
[7, 10000] loss: 0.023
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[7, 12000] loss: 0.029
Epoch number: 8
[8,  2000] loss: 0.014
[8,  4000] loss: 0.016
[8,  6000] loss: 0.020
[8,  8000] loss: 0.019
[8, 10000] loss: 0.017
[8, 12000] loss: 0.017
Epoch number: 9
[9,  2000] loss: 0.010
[9,  4000] loss: 0.014
[9,  6000] loss: 0.015
[9,  8000] loss: 0.017
[9, 10000] loss: 0.018
[9, 12000] loss: 0.017
Epoch number: 10
[10,  2000] loss: 0.009
[10,  4000] loss: 0.014
[10,  6000] loss: 0.008
[10,  8000] loss: 0.015
[10, 10000] loss: 0.016
[10, 12000] loss: 0.014
Finished training for NETWORK 1 .
Training time for NETWORK 1 : 1049.5446747 seconds
Accuracy of the NETWORK 1 on the 10.000 test images: 98 %
Accuracy of     0 : 99 %
Accuracy of     1 : 99 %
Accuracy of     2 : 99 %
Accuracy of     3 : 98 %
Accuracy of     4 : 99 %
Accuracy of     5 : 98 %
Accuracy of     6 : 98 %
Accuracy of     7 : 98 %
Accuracy of     8 : 96 %
Accuracy of     9 : 99 %
##### NETWORK 2 #####
Epoch number: 1
[1,  2000] loss: 2.306
[1,  4000] loss: 2.303
[1,  6000] loss: 2.303
[1,  8000] loss: 2.303
[1, 10000] loss: 2.303
[1, 12000] loss: 2.302
Epoch number: 2
[2,  2000] loss: 2.302
[2,  4000] loss: 2.302
[2,  6000] loss: 2.303
[2,  8000] loss: 2.303
[2, 10000] loss: 2.302
[2, 12000] loss: 2.300
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Epoch number: 3
[3,  2000] loss: 2.301
[3,  4000] loss: 2.299
[3,  6000] loss: 2.295
[3,  8000] loss: 2.276
[3, 10000] loss: 2.068
[3, 12000] loss: 1.343
Epoch number: 4
[4,  2000] loss: 0.755
[4,  4000] loss: 0.562
[4,  6000] loss: 0.424
[4,  8000] loss: 0.323
[4, 10000] loss: 0.267
[4, 12000] loss: 0.210
Epoch number: 5
[5,  2000] loss: 0.190
[5,  4000] loss: 0.167
[5,  6000] loss: 0.155
[5,  8000] loss: 0.146
[5, 10000] loss: 0.133
[5, 12000] loss: 0.135
Epoch number: 6
[6,  2000] loss: 0.125
[6,  4000] loss: 0.106
[6,  6000] loss: 0.111
[6,  8000] loss: 0.098
[6, 10000] loss: 0.097
[6, 12000] loss: 0.102
Epoch number: 7
[7,  2000] loss: 0.087
[7,  4000] loss: 0.089
[7,  6000] loss: 0.076
[7,  8000] loss: 0.092
[7, 10000] loss: 0.079
[7, 12000] loss: 0.081
Epoch number: 8
[8,  2000] loss: 0.073
[8,  4000] loss: 0.064
[8,  6000] loss: 0.081
[8,  8000] loss: 0.067
[8, 10000] loss: 0.073
[8, 12000] loss: 0.075
Epoch number: 9
[9,  2000] loss: 0.066
[9,  4000] loss: 0.061
[9,  6000] loss: 0.058
[9,  8000] loss: 0.062
[9, 10000] loss: 0.061
[9, 12000] loss: 0.067
Epoch number: 10
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[10,  2000] loss: 0.053
[10,  4000] loss: 0.067
[10,  6000] loss: 0.053
[10,  8000] loss: 0.051
[10, 10000] loss: 0.056
[10, 12000] loss: 0.058
Finished training for NETWORK 2 .
Training time for NETWORK 2 : 1207.8034932 seconds
Accuracy of the NETWORK 2 on the 10.000 test images: 98 %
Accuracy of     0 : 99 %
Accuracy of     1 : 99 %
Accuracy of     2 : 97 %
Accuracy of     3 : 96 %
Accuracy of     4 : 99 %
Accuracy of     5 : 96 %
Accuracy of     6 : 99 %
Accuracy of     7 : 97 %
Accuracy of     8 : 98 %
Accuracy of     9 : 96 %
##### NETWORK 3 #####
Epoch number: 1
[1,  2000] loss: 2.300
[1,  4000] loss: 1.638
[1,  6000] loss: 0.337
[1,  8000] loss: 0.158
[1, 10000] loss: 0.118
[1, 12000] loss: 0.095
Epoch number: 2
[2,  2000] loss: 0.077
[2,  4000] loss: 0.069
[2,  6000] loss: 0.077
[2,  8000] loss: 0.062
[2, 10000] loss: 0.059
[2, 12000] loss: 0.054
Epoch number: 3
[3,  2000] loss: 0.046
[3,  4000] loss: 0.034
[3,  6000] loss: 0.046
[3,  8000] loss: 0.048
[3, 10000] loss: 0.045
[3, 12000] loss: 0.043
Epoch number: 4
[4,  2000] loss: 0.034
[4,  4000] loss: 0.035
[4,  6000] loss: 0.030
[4,  8000] loss: 0.036
[4, 10000] loss: 0.030
[4, 12000] loss: 0.037
Epoch number: 5
[5,  2000] loss: 0.022
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[5,  4000] loss: 0.029
[5,  6000] loss: 0.028
[5,  8000] loss: 0.025
[5, 10000] loss: 0.025
[5, 12000] loss: 0.028
Epoch number: 6
[6,  2000] loss: 0.019
[6,  4000] loss: 0.023
[6,  6000] loss: 0.018
[6,  8000] loss: 0.024
[6, 10000] loss: 0.022
[6, 12000] loss: 0.019
Epoch number: 7
[7,  2000] loss: 0.016
[7,  4000] loss: 0.017
[7,  6000] loss: 0.020
[7,  8000] loss: 0.019
[7, 10000] loss: 0.022
[7, 12000] loss: 0.018
Epoch number: 8
[8,  2000] loss: 0.014
[8,  4000] loss: 0.008
[8,  6000] loss: 0.016
[8,  8000] loss: 0.019
[8, 10000] loss: 0.015
[8, 12000] loss: 0.020
Epoch number: 9
[9,  2000] loss: 0.008
[9,  4000] loss: 0.013
[9,  6000] loss: 0.011
[9,  8000] loss: 0.016
[9, 10000] loss: 0.011
[9, 12000] loss: 0.019
Epoch number: 10
[10,  2000] loss: 0.010
[10,  4000] loss: 0.008
[10,  6000] loss: 0.012
[10,  8000] loss: 0.012
[10, 10000] loss: 0.010
[10, 12000] loss: 0.015
Finished training for NETWORK 3 .
Training time for NETWORK 3 : 1756.6175940000003 seconds
Accuracy of the NETWORK 3 on the 10.000 test images: 98 %
Accuracy of     0 : 99 %
Accuracy of     1 : 98 %
Accuracy of     2 : 99 %
Accuracy of     3 : 99 %
Accuracy of     4 : 99 %
Accuracy of     5 : 96 %
Accuracy of     6 : 98 %
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Accuracy of     7 : 98 %
Accuracy of     8 : 99 %
Accuracy of     9 : 98 %
TOTAL Processing time for all these calculations: 4064.7061413 seconds
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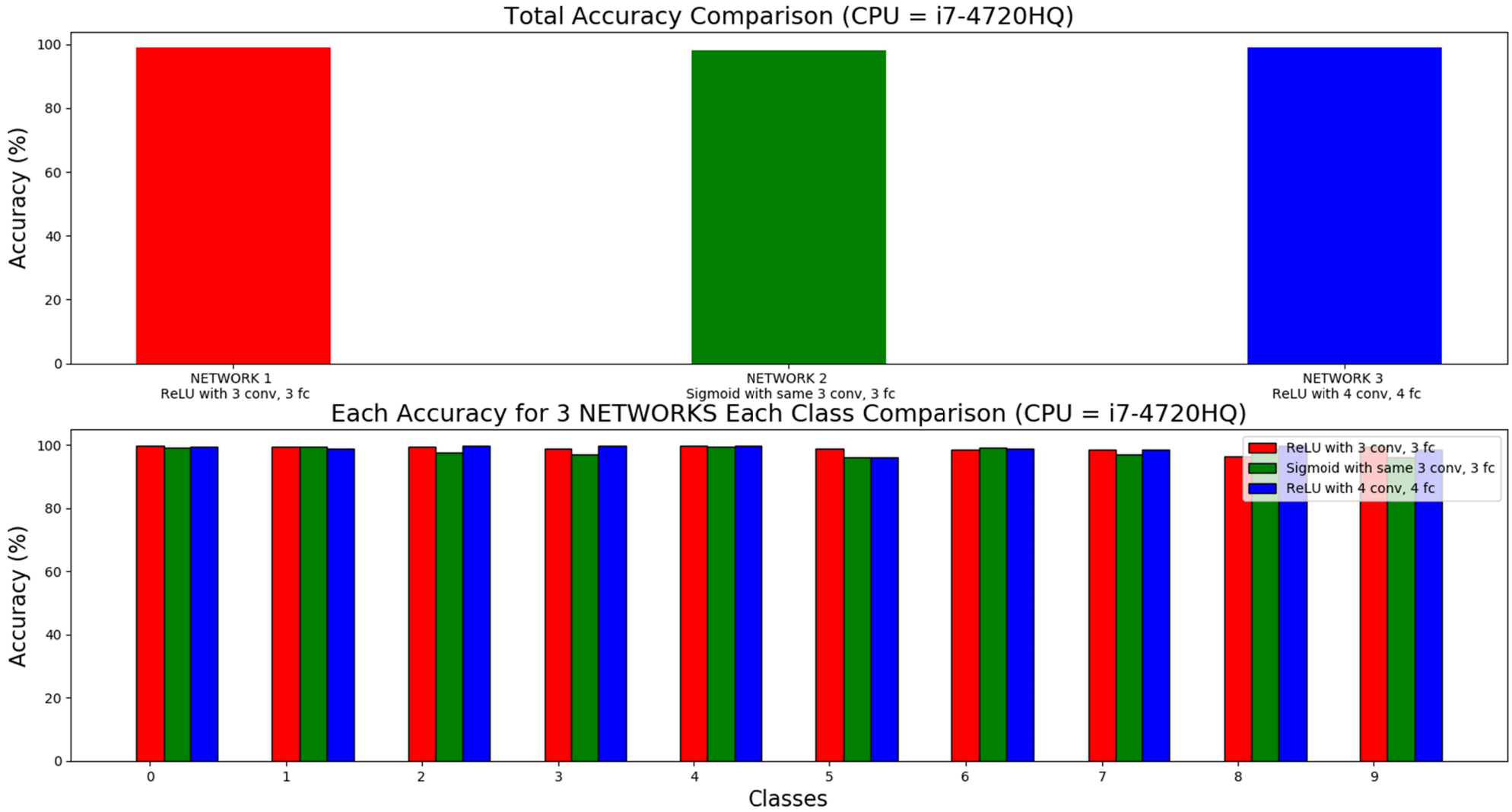
Total Accuracy Comparison (CPU = i7-4720HQ)
Accuracy (%)
0
20
40
60
80
100
NETWORK 1
ReLU with 3 conv, 3 fc
NETWORK 2
Sigmoid with same 3 conv, 3 fc
NETWORK 3
ReLU with 4 conv, 4 fc
Each Accuracy for 3 NETWORKS Each Class Comparison (CPU = i7-4720HQ)
ReLU with 3 conv, 3 fc
Sigmoid with same 3 conv, 3 fc
ReLU with 4 conv, 4 fc
Accuracy (%)
0
20
40
60
80
100
0
1
2
3
4
5
6
7
8
9
Classes