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In This Assignment we applied the Centroid Fucntion to MNIST dataset, and extract feature vectors. and then we implemented NN to classify the dataset.

• Experiments 1,2: are all about tweaking the blocks number. with fixed number of neurons, learning rate and iterations.</p>

• Experiments 3,4,5,6:are all about tweaking the number of neurons.with fixed learning rate,number of blocks and iterations</p>

• Experiments 7,8,9: are all about tweaking the learning rate. with fixed number of neurons, blocks number and iterations.</p>

• Experiments 10,11: are all about tweaking the iterations. with fixed number of neurons, blocks number and learning rate.</p>

Experiments:

Experiment 1:

• Splits the Images into 2 X 2 Blocks

- neurons of hidden layers = 10 , 6
- learning rate = 0.01
- number of iterations = 100

• Accuracy = 60.3 %

Experiment 2:

• Splits the Images into 4 X 4 Blocks

- neurons of hidden layers = 10 , 6
- learning rate = 0.01
- number of iterations = 100

• Accuracy = 69.7 %

Experiment 3:

• neurons of hidden layers = 20 , 12

- Splits the Images into 4 X 4 Blocks
- learning rate = 0.01
- number of iterations = 100

• Accuracy = 77.9 %

Experiment 4:

• neurons of hidden layers = 30 , 45

- Splits the Images into 4 X 4 Blocks
- learning rate = 0.01
- number of iterations = 100

• Accuracy = 82.8 %

Experiment 5:

• neurons of hidden layers = 40 , 24

- Splits the Images into 4 X 4 Blocks
- learning rate = 0.01
- number of iterations = 100

• Accuracy = 83.7 %

Experiment 6:

• neurons of hidden layers = 50 , 45

- Splits the Images into 4 X 4 Blocks
- learning rate = 0.01
- number of iterations = 100

• Accuracy = 80 %

Experiment 7:

• learning rate = 0.02

- Splits the Images into 4 X 4 Blocks
- neurons of hidden layers = 40 , 24
- number of iterations = 100

• Accuracy = 82.8 %

Experiment 8:

• learning rate = 0.03

- Splits the Images into 4 X 4 Blocks
- neurons of hidden layers = 40 , 24
- number of iterations = 100

• Accuracy = 81.8 %

Experiment 9:

• learning rate = 0.05

- Splits the Images into 4 X 4 Blocks
- neurons of hidden layers = 40 , 24
- number of iterations = 100

• Accuracy = 80.9 %

Experiment 10:

• number of iterations = 500

- Splits the Images into 4 X 4 Blocks
- neurons of hidden layers = 40 , 24
- learning rate = 0.01

• Accuracy = 80.1 %

Experiment 11:

• number of iterations = 200

- Splits the Images into 4 X 4 Blocks
- neurons of hidden layers = 40 , 24
- learning rate = 0.01

• Accuracy = 78.7 %

Best case

• neurons of hidden layers = 40 , 24

- Splits the Images into 4 X 4 Blocks
- learning rate = 0.01
- number of iterations = 100

• Accuracy = 83.7 %