

1.

B)

Question 1(b).

-----

Test accuracy: 0.7784

Test precision: 0.746760895171

Test recall: 0.5072

C)

Question 1(c).

-----

Best test accuracy: 0.8182666666666667

Best test recall: 0.5026

Best test precision: 0.752620545073

D)

Question 1(d).

-----

Best test accuracy: 0.8205333333333333

Best test recall: 0.6572

Best test precision: 0.768834815161

E)

Question 1(e).

-----

Best test accuracy: 0.8208

Best test recall: 0.6614

Best test precision: 0.766573945294

3.

A)

Question 3(a).

-----

Validation accuracy net 1: 0.9362

Validation accuracy net 2: 0.936

Validation accuracy net 3: 0.9355

Validation accuracy net 4: 0.9347

Validation accuracy net 5: 0.9325

Validation accuracy net 6: 0.931

Validation accuracy net 7: 0.9363

Validation accuracy net 8: 0.9369

Validation accuracy net 9: 0.9346

Validation accuracy net 10: 0.9383  
Best Net Validation Accuracy: 0.9383  
Best Net Test Accuracy: 0.9449  
Best Net Cross Entropy: 2865.0864082345433  
Learning Rate: 1

B)  
Question 3(b).

-----  
Validation accuracy net 1: 0.9232  
Validation accuracy net 2: 0.9239  
Validation accuracy net 3: 0.9234  
Validation accuracy net 4: 0.9229  
Validation accuracy net 5: 0.9261  
Validation accuracy net 6: 0.927  
Validation accuracy net 7: 0.9252  
Validation accuracy net 8: 0.9262  
Validation accuracy net 9: 0.9251  
Validation accuracy net 10: 0.9271  
Best Net Validation Accuracy: 0.9271  
Best Net Test Accuracy: 0.9341  
Best Net Cross Entropy: 2247.026890968053  
Learning Rate: 1

C)  
Question 3(c).

-----  
Training Accuracy (50 Iterations): 0.9332  
Test Accuracy (50 Iterations): 0.9165  
Cross Entropy (50 Iterations): 2814.9613936544883  
Training Accuracy (200 Iterations): 0.9837  
Test Accuracy (200 Iterations): 0.939  
Cross Entropy (200 Iterations): 2036.6129298524736

D)  
Question 3(d).

-----  
Net 1 Validation Accuracy: 10.17  
Net 2 Validation Accuracy: 10.47  
Net 3 Validation Accuracy: 9.88  
Net 4 Validation Accuracy: 10.2  
Net 5 Validation Accuracy: 10.54  
Net 6 Validation Accuracy: 8.96  
Net 7 Validation Accuracy: 9.73

Net 8 Validation Accuracy: 11.4  
Net 9 Validation Accuracy: 11.0  
Net 10 Validation Accuracy: 12.61  
Best Trained Net Results  
Validation accuracy: 12.61  
Test accuracy: 13.76  
Cross Entropy: 91996.8155614348  
Learning rate: 1.27551020408e-09

E)

Question 3(e).

-----

Net 1 Validation Accuracy: 8.74  
Net 2 Validation Accuracy: 10.55  
Net 3 Validation Accuracy: 9.04  
Net 4 Validation Accuracy: 8.13  
Net 5 Validation Accuracy: 11.13  
Net 6 Validation Accuracy: 9.42  
Net 7 Validation Accuracy: 10.26  
Net 8 Validation Accuracy: 9.86  
Net 9 Validation Accuracy: 11.81  
Net 10 Validation Accuracy: 10.13  
Best Trained Net Results  
Validation accuracy: 0  
Test accuracy: 9.95  
Cross Entropy: 92106.57038834562  
Learning rate: 1e-08

F)

Question 3(f).

-----

Epoch 10 test accuracy: 10.42  
Epoch 20 test accuracy: 11.25  
Epoch 30 test accuracy: 10.92  
Epoch 40 test accuracy: 10.78  
Epoch 50 test accuracy: 10.67  
Epoch 60 test accuracy: 10.54  
Epoch 70 test accuracy: 10.54  
Epoch 80 test accuracy: 10.47  
Epoch 90 test accuracy: 10.47  
Epoch 100 test accuracy: 10.5  
Final training accuracy: 9.0  
Final test accuracy: 10.5

Final cross entropy: 92106.94702580551

G)

(Did not run)