Part1 result

Perceptron:

perceptron with n = 500

0.9931

perceptron with n = 1000

0.9664

bestresult: correct\_500 = 0.9931 correct\_1000 = 0.9664

Perceptron with margin:

perceptron(margin) with n = 500, r = 1.5

0.9931

perceptron(margin) with n = 1000, r = 1.5

0.9664

perceptron(margin) with n = 500, r = 0.25

0.9953

perceptron(margin) with n = 1000, r = 0.25

0.9822

perceptron(margin) with n = 500, r = 0.03

0.9975

perceptron(margin) with n = 1000, r = 0.03

0.9839

perceptron(margin) with n = 500, r = 0.005

0.9994

perceptron(margin) with n = 1000, r = 0.005

0.9844

perceptron(margin) with n = 500, r = 0.001

0.9958

perceptron(margin) with n = 1000, r = 0.001

0.9953

bestresult: correct\_500 = 0.9958 correct\_1000 = 0.9953 learning rate = 0.001

Winnow:

winnow with n = 500, alpha = 1.1

0.9998

winnow with n = 1000, alpha = 1.1

0.9994

winnow with n = 500, alpha = 1.01

0.9799

winnow with n = 1000, alpha = 1.01

0.967

winnow with n = 500, alpha = 1.005

0.9602

winnow with n = 1000, alpha = 1.005

0.8998

winnow with n = 500, alpha = 1.0005

0.5376

winnow with n = 1000, alpha = 1.0005

0.5255

winnow with n = 500, alpha = 1.0001

0.525

winnow with n = 1000, alpha = 1.0001

0.5197

bestresult: correct\_500 = 0.9998 correct\_1000 = 0.9994 alpha = 1.1

Winnow with margin:

winnow(margin) with n = 500, alpha = 1.1 gamma = 2.0

1.0

winnow(margin) with n = 1000, alpha = 1.1 gamma = 2.0

0.9992

winnow(margin) with n = 500, alpha = 1.1 gamma = 0.3

0.9981

winnow(margin) with n = 1000, alpha = 1.1 gamma = 0.3

0.9992

winnow(margin) with n = 500, alpha = 1.1 gamma = 0.04

0.9992

winnow(margin) with n = 1000, alpha = 1.1 gamma = 0.04

0.9996

winnow(margin) with n = 500, alpha = 1.1 gamma = 0.006

0.9998

winnow(margin) with n = 1000, alpha = 1.1 gamma = 0.006

0.9994

winnow(margin) with n = 500, alpha = 1.1 gamma = 0.001

0.9998

winnow(margin) with n = 1000, alpha = 1.1 gamma = 0.001

0.9994

winnow(margin) with n = 500, alpha = 1.01 gamma = 2.0

0.9866

winnow(margin) with n = 1000, alpha = 1.01 gamma = 2.0

0.9721

winnow(margin) with n = 500, alpha = 1.01 gamma = 0.3

0.9797

winnow(margin) with n = 1000, alpha = 1.01 gamma = 0.3

0.9688

winnow(margin) with n = 500, alpha = 1.01 gamma = 0.04

0.9804

winnow(margin) with n = 1000, alpha = 1.01 gamma = 0.04

0.9664

winnow(margin) with n = 500, alpha = 1.01 gamma = 0.006

0.9789

winnow(margin) with n = 1000, alpha = 1.01 gamma = 0.006

0.9673

winnow(margin) with n = 500, alpha = 1.01 gamma = 0.001

0.9796

winnow(margin) with n = 1000, alpha = 1.01 gamma = 0.001

0.9668

winnow(margin) with n = 500, alpha = 1.005 gamma = 2.0

0.9717

winnow(margin) with n = 1000, alpha = 1.005 gamma = 2.0

0.9144

winnow(margin) with n = 500, alpha = 1.005 gamma = 0.3

0.9618

winnow(margin) with n = 1000, alpha = 1.005 gamma = 0.3

0.8933

winnow(margin) with n = 500, alpha = 1.005 gamma = 0.04

0.9617

winnow(margin) with n = 1000, alpha = 1.005 gamma = 0.04

0.8913

winnow(margin) with n = 500, alpha = 1.005 gamma = 0.006

0.9606

winnow(margin) with n = 1000, alpha = 1.005 gamma = 0.006

0.8929

winnow(margin) with n = 500, alpha = 1.005 gamma = 0.001

0.9595

winnow(margin) with n = 1000, alpha = 1.005 gamma = 0.001

0.8932

winnow(margin) with n = 500, alpha = 1.0005 gamma = 2.0

0.5387

winnow(margin) with n = 1000, alpha = 1.0005 gamma = 2.0

0.525

winnow(margin) with n = 500, alpha = 1.0005 gamma = 0.3

0.5373

winnow(margin) with n = 1000, alpha = 1.0005 gamma = 0.3

0.5256

winnow(margin) with n = 500, alpha = 1.0005 gamma = 0.04

0.5376

winnow(margin) with n = 1000, alpha = 1.0005 gamma = 0.04

0.5244

winnow(margin) with n = 500, alpha = 1.0005 gamma = 0.006

0.5374

winnow(margin) with n = 1000, alpha = 1.0005 gamma = 0.006

0.5252

winnow(margin) with n = 500, alpha = 1.0005 gamma = 0.001

0.5377

winnow(margin) with n = 1000, alpha = 1.0005 gamma = 0.001

0.5252

winnow(margin) with n = 500, alpha = 1.0001 gamma = 2.0

0.5257

winnow(margin) with n = 1000, alpha = 1.0001 gamma = 2.0

0.5204

winnow(margin) with n = 500, alpha = 1.0001 gamma = 0.3

0.5254

winnow(margin) with n = 1000, alpha = 1.0001 gamma = 0.3

0.5195

winnow(margin) with n = 500, alpha = 1.0001 gamma = 0.04

0.5253

winnow(margin) with n = 1000, alpha = 1.0001 gamma = 0.04

0.5197

winnow(margin) with n = 500, alpha = 1.0001 gamma = 0.006

0.5253

winnow(margin) with n = 1000, alpha = 1.0001 gamma = 0.006

0.5197

winnow(margin) with n = 500, alpha = 1.0001 gamma = 0.001

0.525

winnow(margin) with n = 1000, alpha = 1.0001 gamma = 0.001

0.5198

bestresult: correct\_500 = 1.0 correct\_1000 = 0.9992 alpha = 1.1 gamma = 2.0

Adagrad:

adagrad with n = 500, alpha = 1.5

0.9827

adagrad with n = 1000, alpha = 1.5

0.9946

adagrad with n = 500, alpha = 0.25

0.9906

adagrad with n = 1000, alpha = 0.25

0.9947

adagrad with n = 500, alpha = 0.03

0.9581

adagrad with n = 1000, alpha = 0.03

0.9428

adagrad with n = 500, alpha = 0.005

0.6657

adagrad with n = 1000, alpha = 0.005

0.6202

adagrad with n = 500, alpha = 0.001

0.4977

adagrad with n = 1000, alpha = 0.001

0.5

bestresult: correct\_500 = 0.9906 correct\_1000 = 0.9947 learning rate = 0.25