Part2 Results

Perceptron:

perceptron with n = 40

1.0

perceptron with n = 80

1.0

perceptron with n = 120

0.9999

perceptron with n = 160

0.9999

perceptron with n = 200

0.9994

bestresult: correct1 = 1.0 n = 40

Perceptron with margin:

perceptron\_margin with n = 40, r = 1.5

1.0

perceptron\_margin with n = 40, r = 0.25

1.0

perceptron\_margin with n = 40, r = 0.03

1.0

perceptron\_margin with n = 40, r = 0.005

1.0

perceptron\_margin with n = 40, r = 0.001

1.0

bestresult for n = 40 : correct1 = 1.0 learning rate = 1.5

perceptron\_margin with n = 80, r = 1.5

0.9998

perceptron\_margin with n = 80, r = 0.25

1.0

perceptron\_margin with n = 80, r = 0.03

1.0

perceptron\_margin with n = 80, r = 0.005

1.0

perceptron\_margin with n = 80, r = 0.001

1.0

bestresult for n = 80 : correct1 = 1.0 learning rate = 0.25

perceptron\_margin with n = 120, r = 1.5

0.9998

perceptron\_margin with n = 120, r = 0.25

1.0

perceptron\_margin with n = 120, r = 0.03

1.0

perceptron\_margin with n = 120, r = 0.005

1.0

perceptron\_margin with n = 120, r = 0.001

0.9959

bestresult for n = 120 : correct1 = 1.0 learning rate = 0.25

perceptron\_margin with n = 160, r = 1.5

0.9997

perceptron\_margin with n = 160, r = 0.25

1.0

perceptron\_margin with n = 160, r = 0.03

1.0

perceptron\_margin with n = 160, r = 0.005

1.0

perceptron\_margin with n = 160, r = 0.001

0.9867

bestresult for n = 160 : correct1 = 1.0 learning rate = 0.25

perceptron\_margin with n = 200, r = 1.5

0.9999

perceptron\_margin with n = 200, r = 0.25

0.9996

perceptron\_margin with n = 200, r = 0.03

1.0

perceptron\_margin with n = 200, r = 0.005

1.0

perceptron\_margin with n = 200, r = 0.001

0.9842

bestresult for n = 200 : correct1 = 1.0 learning rate = 0.03

Winnow:

winnow with n = 40, alpha = 1.1

0.9999

winnow with n = 40, alpha = 1.01

0.9991

winnow with n = 40, alpha = 1.005

0.9987

winnow with n = 40, alpha = 1.0005

0.9917

winnow with n = 40, alpha = 1.0001

0.8588

bestresult n = 40: correct1 = 0.9999 alpha = 1.1

winnow with n = 80, alpha = 1.1

1.0

winnow with n = 80, alpha = 1.01

0.9983

winnow with n = 80, alpha = 1.005

0.9981

winnow with n = 80, alpha = 1.0005

0.9743

winnow with n = 80, alpha = 1.0001

0.6979

bestresult n = 80: correct1 = 1.0 alpha = 1.1

winnow with n = 120, alpha = 1.1

1.0

winnow with n = 120, alpha = 1.01

0.9973

winnow with n = 120, alpha = 1.005

0.9971

winnow with n = 120, alpha = 1.0005

0.9496

winnow with n = 120, alpha = 1.0001

0.6431

bestresult n = 120: correct1 = 1.0 alpha = 1.1

winnow with n = 160, alpha = 1.1

0.9993

winnow with n = 160, alpha = 1.01

0.9971

winnow with n = 160, alpha = 1.005

0.9968

winnow with n = 160, alpha = 1.0005

0.9362

winnow with n = 160, alpha = 1.0001

0.6188

bestresult n = 160: correct1 = 0.9993 alpha = 1.1

winnow with n = 200, alpha = 1.1

0.9998

winnow with n = 200, alpha = 1.01

0.9983

winnow with n = 200, alpha = 1.005

0.998

winnow with n = 200, alpha = 1.0005

0.922

winnow with n = 200, alpha = 1.0001

0.6081

bestresult n = 200: correct1 = 0.9998 alpha = 1.1

Winnow with margin:

winnow\_margin with n = 40, alpha = 1.1 gamma = 2.0

1.0

winnow\_margin with n = 40, alpha = 1.1 gamma = 0.3

0.9998

winnow\_margin with n = 40, alpha = 1.1 gamma = 0.04

0.9998

winnow\_margin with n = 40, alpha = 1.1 gamma = 0.006

0.9999

winnow\_margin with n = 40, alpha = 1.1 gamma = 0.001

0.9999

winnow\_margin with n = 40, alpha = 1.01 gamma = 2.0

1.0

winnow\_margin with n = 40, alpha = 1.01 gamma = 0.3

0.9995

winnow\_margin with n = 40, alpha = 1.01 gamma = 0.04

0.9991

winnow\_margin with n = 40, alpha = 1.01 gamma = 0.006

0.999

winnow\_margin with n = 40, alpha = 1.01 gamma = 0.001

0.9988

winnow\_margin with n = 40, alpha = 1.005 gamma = 2.0

1.0

winnow\_margin with n = 40, alpha = 1.005 gamma = 0.3

0.9994

winnow\_margin with n = 40, alpha = 1.005 gamma = 0.04

0.9987

winnow\_margin with n = 40, alpha = 1.005 gamma = 0.006

0.9987

winnow\_margin with n = 40, alpha = 1.005 gamma = 0.001

0.9987

winnow\_margin with n = 40, alpha = 1.0005 gamma = 2.0

1.0

winnow\_margin with n = 40, alpha = 1.0005 gamma = 0.3

0.9939

winnow\_margin with n = 40, alpha = 1.0005 gamma = 0.04

0.9927

winnow\_margin with n = 40, alpha = 1.0005 gamma = 0.006

0.9918

winnow\_margin with n = 40, alpha = 1.0005 gamma = 0.001

0.9917

winnow\_margin with n = 40, alpha = 1.0001 gamma = 2.0

0.8955

winnow\_margin with n = 40, alpha = 1.0001 gamma = 0.3

0.8619

winnow\_margin with n = 40, alpha = 1.0001 gamma = 0.04

0.861

winnow\_margin with n = 40, alpha = 1.0001 gamma = 0.006

0.8594

winnow\_margin with n = 40, alpha = 1.0001 gamma = 0.001

0.8591

bestresult for n = 40: correct1 = 1.0 alpha = 1.1 gamma = 2.0

winnow\_margin with n = 80, alpha = 1.1 gamma = 2.0

1.0

winnow\_margin with n = 80, alpha = 1.1 gamma = 0.3

1.0

winnow\_margin with n = 80, alpha = 1.1 gamma = 0.04

1.0

winnow\_margin with n = 80, alpha = 1.1 gamma = 0.006

1.0

winnow\_margin with n = 80, alpha = 1.1 gamma = 0.001

1.0

winnow\_margin with n = 80, alpha = 1.01 gamma = 2.0

1.0

winnow\_margin with n = 80, alpha = 1.01 gamma = 0.3

0.9988

winnow\_margin with n = 80, alpha = 1.01 gamma = 0.04

0.9988

winnow\_margin with n = 80, alpha = 1.01 gamma = 0.006

0.9982

winnow\_margin with n = 80, alpha = 1.01 gamma = 0.001

0.9983

winnow\_margin with n = 80, alpha = 1.005 gamma = 2.0

0.9999

winnow\_margin with n = 80, alpha = 1.005 gamma = 0.3

0.9988

winnow\_margin with n = 80, alpha = 1.005 gamma = 0.04

0.9985

winnow\_margin with n = 80, alpha = 1.005 gamma = 0.006

0.9983

winnow\_margin with n = 80, alpha = 1.005 gamma = 0.001

0.9982

winnow\_margin with n = 80, alpha = 1.0005 gamma = 2.0

0.9967

winnow\_margin with n = 80, alpha = 1.0005 gamma = 0.3

0.9783

winnow\_margin with n = 80, alpha = 1.0005 gamma = 0.04

0.9753

winnow\_margin with n = 80, alpha = 1.0005 gamma = 0.006

0.9744

winnow\_margin with n = 80, alpha = 1.0005 gamma = 0.001

0.9742

winnow\_margin with n = 80, alpha = 1.0001 gamma = 2.0

0.73

winnow\_margin with n = 80, alpha = 1.0001 gamma = 0.3

0.7022

winnow\_margin with n = 80, alpha = 1.0001 gamma = 0.04

0.6983

winnow\_margin with n = 80, alpha = 1.0001 gamma = 0.006

0.6979

winnow\_margin with n = 80, alpha = 1.0001 gamma = 0.001

0.698

bestresult for n = 80: correct1 = 1.0 alpha = 1.1 gamma = 2.0

winnow\_margin with n = 120, alpha = 1.1 gamma = 2.0

1.0

winnow\_margin with n = 120, alpha = 1.1 gamma = 0.3

0.9997

winnow\_margin with n = 120, alpha = 1.1 gamma = 0.04

1.0

winnow\_margin with n = 120, alpha = 1.1 gamma = 0.006

1.0

winnow\_margin with n = 120, alpha = 1.1 gamma = 0.001

1.0

winnow\_margin with n = 120, alpha = 1.01 gamma = 2.0

0.9998

winnow\_margin with n = 120, alpha = 1.01 gamma = 0.3

0.9982

winnow\_margin with n = 120, alpha = 1.01 gamma = 0.04

0.9971

winnow\_margin with n = 120, alpha = 1.01 gamma = 0.006

0.9975

winnow\_margin with n = 120, alpha = 1.01 gamma = 0.001

0.9975

winnow\_margin with n = 120, alpha = 1.005 gamma = 2.0

0.9996

winnow\_margin with n = 120, alpha = 1.005 gamma = 0.3

0.9977

winnow\_margin with n = 120, alpha = 1.005 gamma = 0.04

0.997

winnow\_margin with n = 120, alpha = 1.005 gamma = 0.006

0.9971

winnow\_margin with n = 120, alpha = 1.005 gamma = 0.001

0.9972

winnow\_margin with n = 120, alpha = 1.0005 gamma = 2.0

0.9853

winnow\_margin with n = 120, alpha = 1.0005 gamma = 0.3

0.9568

winnow\_margin with n = 120, alpha = 1.0005 gamma = 0.04

0.9508

winnow\_margin with n = 120, alpha = 1.0005 gamma = 0.006

0.9498

winnow\_margin with n = 120, alpha = 1.0005 gamma = 0.001

0.9495

winnow\_margin with n = 120, alpha = 1.0001 gamma = 2.0

0.6574

winnow\_margin with n = 120, alpha = 1.0001 gamma = 0.3

0.6465

winnow\_margin with n = 120, alpha = 1.0001 gamma = 0.04

0.6433

winnow\_margin with n = 120, alpha = 1.0001 gamma = 0.006

0.643

winnow\_margin with n = 120, alpha = 1.0001 gamma = 0.001

0.643

bestresult for n = 120: correct1 = 1.0 alpha = 1.1 gamma = 2.0

winnow\_margin with n = 160, alpha = 1.1 gamma = 2.0

1.0

winnow\_margin with n = 160, alpha = 1.1 gamma = 0.3

1.0

winnow\_margin with n = 160, alpha = 1.1 gamma = 0.04

0.9996

winnow\_margin with n = 160, alpha = 1.1 gamma = 0.006

0.9993

winnow\_margin with n = 160, alpha = 1.1 gamma = 0.001

0.9993

winnow\_margin with n = 160, alpha = 1.01 gamma = 2.0

0.9996

winnow\_margin with n = 160, alpha = 1.01 gamma = 0.3

0.9981

winnow\_margin with n = 160, alpha = 1.01 gamma = 0.04

0.9974

winnow\_margin with n = 160, alpha = 1.01 gamma = 0.006

0.9974

winnow\_margin with n = 160, alpha = 1.01 gamma = 0.001

0.9971

winnow\_margin with n = 160, alpha = 1.005 gamma = 2.0

0.9992

winnow\_margin with n = 160, alpha = 1.005 gamma = 0.3

0.997

winnow\_margin with n = 160, alpha = 1.005 gamma = 0.04

0.9965

winnow\_margin with n = 160, alpha = 1.005 gamma = 0.006

0.9969

winnow\_margin with n = 160, alpha = 1.005 gamma = 0.001

0.9968

winnow\_margin with n = 160, alpha = 1.0005 gamma = 2.0

0.9709

winnow\_margin with n = 160, alpha = 1.0005 gamma = 0.3

0.943

winnow\_margin with n = 160, alpha = 1.0005 gamma = 0.04

0.9374

winnow\_margin with n = 160, alpha = 1.0005 gamma = 0.006

0.9363

winnow\_margin with n = 160, alpha = 1.0005 gamma = 0.001

0.9365

winnow\_margin with n = 160, alpha = 1.0001 gamma = 2.0

0.6259

winnow\_margin with n = 160, alpha = 1.0001 gamma = 0.3

0.6203

winnow\_margin with n = 160, alpha = 1.0001 gamma = 0.04

0.6189

winnow\_margin with n = 160, alpha = 1.0001 gamma = 0.006

0.619

winnow\_margin with n = 160, alpha = 1.0001 gamma = 0.001

0.6189

bestresult for n = 160: correct1 = 1.0 alpha = 1.1 gamma = 2.0

winnow\_margin with n = 200, alpha = 1.1 gamma = 2.0

1.0

winnow\_margin with n = 200, alpha = 1.1 gamma = 0.3

0.9999

winnow\_margin with n = 200, alpha = 1.1 gamma = 0.04

0.9999

winnow\_margin with n = 200, alpha = 1.1 gamma = 0.006

0.9998

winnow\_margin with n = 200, alpha = 1.1 gamma = 0.001

0.9998

winnow\_margin with n = 200, alpha = 1.01 gamma = 2.0

0.9994

winnow\_margin with n = 200, alpha = 1.01 gamma = 0.3

0.9986

winnow\_margin with n = 200, alpha = 1.01 gamma = 0.04

0.9983

winnow\_margin with n = 200, alpha = 1.01 gamma = 0.006

0.998

winnow\_margin with n = 200, alpha = 1.01 gamma = 0.001

0.9983

winnow\_margin with n = 200, alpha = 1.005 gamma = 2.0

0.9994

winnow\_margin with n = 200, alpha = 1.005 gamma = 0.3

0.9983

winnow\_margin with n = 200, alpha = 1.005 gamma = 0.04

0.9981

winnow\_margin with n = 200, alpha = 1.005 gamma = 0.006

0.9979

winnow\_margin with n = 200, alpha = 1.005 gamma = 0.001

0.998

winnow\_margin with n = 200, alpha = 1.0005 gamma = 2.0

0.9552

winnow\_margin with n = 200, alpha = 1.0005 gamma = 0.3

0.9266

winnow\_margin with n = 200, alpha = 1.0005 gamma = 0.04

0.9226

winnow\_margin with n = 200, alpha = 1.0005 gamma = 0.006

0.9225

winnow\_margin with n = 200, alpha = 1.0005 gamma = 0.001

0.9221

winnow\_margin with n = 200, alpha = 1.0001 gamma = 2.0

0.6143

winnow\_margin with n = 200, alpha = 1.0001 gamma = 0.3

0.6092

winnow\_margin with n = 200, alpha = 1.0001 gamma = 0.04

0.6084

winnow\_margin with n = 200, alpha = 1.0001 gamma = 0.006

0.6085

winnow\_margin with n = 200, alpha = 1.0001 gamma = 0.001

0.6081

bestresult for n = 200: correct1 = 1.0 alpha = 1.1 gamma = 2.0

Adagrad:

adagrad with n = 40, r = 1.5

1.0

adagrad with n = 40, r = 0.25

1.0

adagrad with n = 40, r = 0.03

0.7916

adagrad with n = 40, r = 0.005

0.5034

adagrad with n = 40, r = 0.001

0.4925

bestresult for n = 40: correct1 = 1.0 learning rate = 1.5

adagrad with n = 80, r = 1.5

1.0

adagrad with n = 80, r = 0.25

1.0

adagrad with n = 80, r = 0.03

0.852

adagrad with n = 80, r = 0.005

0.7071

adagrad with n = 80, r = 0.001

0.508

bestresult for n = 80: correct1 = 1.0 learning rate = 1.5

adagrad with n = 120, r = 1.5

1.0

adagrad with n = 120, r = 0.25

1.0

adagrad with n = 120, r = 0.03

0.8925

adagrad with n = 120, r = 0.005

0.7441

adagrad with n = 120, r = 0.001

0.4957

bestresult for n = 120: correct1 = 1.0 learning rate = 1.5

adagrad with n = 160, r = 1.5

1.0

adagrad with n = 160, r = 0.25

0.9994

adagrad with n = 160, r = 0.03

0.9218

adagrad with n = 160, r = 0.005

0.7467

adagrad with n = 160, r = 0.001

0.4982

bestresult for n = 160: correct1 = 1.0 learning rate = 1.5

adagrad with n = 200, r = 1.5

0.9982

adagrad with n = 200, r = 0.25

0.9945

adagrad with n = 200, r = 0.03

0.943

adagrad with n = 200, r = 0.005

0.8108

adagrad with n = 200, r = 0.001

0.5011

bestresult for n = 200: correct1 = 0.9982 learning rate = 1.5

Error Converge Matrix:

First line is perceptron, then perceptron with margin, etc.

[[ 6813. 15613. 29726. 65649. 87072.]

[ 6813. 20237. 33113. 55279. 113703.]

[ 2991. 4164. 4310. 5496. 4864.]

[ 4155. 3481. 4974. 5909. 4809.]

[ 11487. 23261. 55118. 129357. 183558.]]