

Below are the outputs, we can see that when eta is 0.01, 0.001, 0.0001, the accuracy behaves wildly, randomly landed in range from 0.6 to 0.72. However, we can see that as we choose a smaller eta, 0.00001 and 0.000001, we will get a result around 0.7 for most of the time. For epsilon, we don't really care about it once it gets to smaller than 0.0001 because it will not make a difference to the result

Converge at this point!

Weight is: [-6.18824254 -188.60695962 -221.89221878 -917.27227656

460.28624397 544.15625703 -670.64852932 266.09118734

202.62487067 -70.34054926 -345.20380825 -28.64367953

-266.0719757 -27.04699801 506.2912566 -112.43048754

-1239.78773411 416.02627263 815.49199924 165.33922255

268.98739442 -3.29759492 44.57739809 -151.01650962

-3.78374269 -124.41131749 -1.66126068]

eta: 0.01, eps: 0.001, maxiter: 1000000000

Traning data has an accuracy of 0.659620674677863

Testing data has an accuracy of 0.6596283783783784

Converge at this point!

Weight is: [-5.48657480e+00 -2.15206228e+02 -3.65132192e+02 -8.94525984e+02

6.30040892e+02 5.57657201e+02 -5.77100619e+02 1.92826843e+02

1.56269783e+02 -1.40384425e+02 -3.17831980e+02 -3.31507637e+01

-2.96751805e+02 -1.71725163e+01 4.10133562e+02 -1.15259019e+02

-1.24663873e+03 4.75831058e+02 8.85858580e+02 1.13375835e+02

-5.98957950e+01 8.98194689e+00 -5.45342857e+01 -1.60711880e+02

2.02773479e+00 2.70713012e+02 -1.11198412e-01]

eta: 0.01, eps: 0.0001, maxiter: 1000000000

Traning data has an accuracy of 0.6277689300709425:

Testing data has an accuracy of 0.6131756756756757:

Converge at this point!

Weight is: [-5.48657480e+00 -2.15206228e+02 -3.65132192e+02 -8.94525984e+02

6.30040892e+02 5.57657201e+02 -5.77100619e+02 1.92826843e+02

1.56269783e+02 -1.40384425e+02 -3.17831980e+02 -3.31507637e+01

-2.96751805e+02 -1.71725163e+01 4.10133562e+02 -1.15259019e+02

-1.24663873e+03 4.75831058e+02 8.85858580e+02 1.13375835e+02

-5.98957950e+01 8.98194689e+00 -5.45342857e+01 -1.60711880e+02

2.02773479e+00 2.70713012e+02 -1.11198412e-01]

eta: 0.01, eps: 0.0001, maxiter: 1000000000

Traning data has an accuracy of 0.6277689300709425:

Testing data has an accuracy of 0.6131756756756757:

Converge at this point!

Weight is: [-2.04981510e-01 -2.08583167e+01 -5.15432771e+00 -8.12748592e+01

4.19649991e+01 4.64799330e+01 -7.21207074e+01 1.80998227e+01

1.22211492e+01 -7.40844948e+00 -2.39694417e+01 -3.52596540e+00

-1.86177150e+01 -1.45444643e+00 6.27788849e+01 -5.63568924e+00

-1.38998537e+02 4.27631997e+01 8.40400652e+01 1.15274752e+01

1.48507229e+01 4.49496539e-01 2.46067560e+00 -1.62029551e+01

-5.07795977e-01 -9.32433566e+00 -4.47450081e-02]

eta: 0.001, eps: 0.0001, maxiter: 1000000000

Traning data has an accuracy of 0.7196322571304473:

Testing data has an accuracy of 0.7265202702702702:

Converge at this point!

Weight is: [-0.13018774 -1.97601215 -1.74658706 -7.57011331 5.15146429

4.54026424 -5.53124818 1.24340489 -0.03511782 -0.87397531

-3.03556068 -0.38306461 -2.89988019 -0.16934454 6.14523675

-0.99294469 -12.82633774 4.67630955 7.45158839 1.29854969

1.89380396 0.05113228 0.05867764 -1.22084062 0.02001615

-0.39303762 0.03466181]

eta: 0.0001, eps: 1e-05, maxiter: 1000000000

Traning data has an accuracy of 0.7341827131895179

Testing data has an accuracy of 0.7388513513513514

Converge at this point!

Weight is: [-1.24409521e-02 -1.99518198e-01 1.01267197e-02 -7.47008793e-01

2.44014356e-01 3.68384595e-01 -6.16129420e-01 1.97763211e-01

-1.82074741e-02 -7.46533795e-02 -1.80845961e-01 -2.80847599e-02

-2.28854416e-01 -2.08585606e-02 6.46292203e-01 -9.91785029e-02

-1.35800544e+00 4.54486319e-01 7.47822746e-01 1.22749132e-01

1.51823304e-01 6.54902237e-03 1.73063818e-02 -1.84307473e-01

2.81493173e-04 -2.75530376e-02 -2.41649978e-03]

eta: 1e-05, eps: 1e-05, maxiter: 1000000000

Traning data has an accuracy of 0.7324453453018677

Testing data has an accuracy of 0.737331081081081