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Neural Network Assignment 6 Machine Learning

Best Hyper Parameter Function working. Used algorithm very similar to assignment one to optimize. It says test score but it's actually optimization score for the left pictuxre.

```
Test Score: 0.7062
Test CE: 1.6175417006555226
Epoch: 5
Test Score: 0.7376
Test CE: 1.4601279421196165
Epoch: 6
Test Score: 0.762
Test CE: 1.311744183495366
Epoch: 7
Test Score: 0.7816
Test CE: 1.1797546330109983
Epoch: 8
Test Score: 0.7966
Test CE: 1.067531425563266
Epoch: 9
Test Score: 0.8084
Test CE: 0.9744764624421062
[2 0 0 0 0]
Epoch: 0
Test Score: 0.5226
Test CE: 2.0679522851137433
Epoch: 1
Test Score: 0.6638
Test CE: 1.775090424940065
Epoch: 2
Test Score: 0.732
Test CE: 1.460470335864731
Epoch: 3
Test Score: 0.777
Test CE: 1.1803010838628227
Epoch: 4
Test Score: 0.8006
Test CE: 0.9749364137617892
Epoch: 5
Test Score: 0.8214
Test CE: 0.835180223482311
```

Final Optimization Results
Learning Rate: 0.01
L2 Reg Coefficient: 0.0001,
L1 Reg Coefficient: 0
Batch Size: 8
Epochs: 30

(0.01, 5e-05, 0.0, 8, 30,

Final 20 Epochs

```
6.143285131952996e-07
Epoch: 0
Test Score: 0.933
Test CE: 0.23405802611009824
Epoch: 1
Test Score: 0.9474
Test CE: 0.17735244578952108
Epoch: 2
Test Score: 0.9539
Test CE: 0.15329403686099186
Epoch: 3
Test Score: 0.9578
Test CE: 0.13965670980108766
Epoch: 4
Test Score: 0.961
Test CE: 0.13034364325894535
Epoch: 5
Test Score: 0.9632
Test CE: 0.12197588772324462
Epoch: 6
Test Score: 0.9652
Test CE: 0.11709240531963536
Epoch: 7
Test Score: 0.9662
Test CE: 0.1152478320967191
Epoch: 8
Test Score: 0.9665
Test CE: 0.11266491531713878
Epoch: 9
Test Score: 0.9677
Test CE: 0.11025745214640424
Epoch: 10
Test Score: 0.969
Test CE: 0.1093484224900492
Epoch: 11
Test Score: 0.9696
Test CE: 0.10901738478845105
Epoch: 12
Test Score: 0.97
Test CE: 0.1083145199562431
Epoch: 13
Test Score: 0.9696
Test CE: 0.10896159945957673
Epoch: 14
Test Score: 0.9697
Test CE: 0.11075288567382216
Epoch: 15
Test Score: 0.9699
Test CE: 0.11106874508065533
Epoch: 16
Test Score: 0.9694
Test CE: 0.1119166716078225
Epoch: 17
Test Score: 0.9688
Test CE: 0.11302972149301038
Epoch: 18
Test Score: 0.9689
Test CE: 0.11367934842554696
Epoch: 19
Test Score: 0.9689
Test CE: 0.11512756522100404
```

