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Week 5

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Assignment: Neural Network Learning

[← Week 5](#)

Test cases for ex4 nnCostFunction()



Tom Mosher · Mentor · Week 5 · 3 years ago · Edited

Here is a test case for the nnCostFunction() with (and without) regularization:

Enter these values in your console workspace, compare your results with those given.

Test Case with regularization:

```
1 il = 2;           % input layer
2 hl = 2;           % hidden layer
3 nl = 4;           % number of labels
4 nn = [ 1:18 ] / 10; % nn_params
5 X = cos([1 2 ; 3 4 ; 5 6]);
6 y = [4; 2; 3];
7 lambda = 4;
8 [J grad] = nnCostFunction(nn, il, hl, nl, X, y, lambda)
```

output:



```
1 J = 19.474
2 grad =
3 0.76614
4 0.97990
5 0.37246
6 0.49749
7 0.64174
8 0.74614
9 0.88342
10 0.56876
11 0.58467
12 0.59814
13 1.92598
14 1.94462
15 1.98965
16 2.17855
17 2.47834
18 2.50225
19 2.52644
20 2.72233
```

Here are the values for all internal variables for the regularized test case:



```
1 d2 =
2   0.79393  1.05281
3   0.73674  0.95128
4   0.76775  0.93560
5
6 d3 =
7   0.888659  0.907427  0.923305 -0.063351
8   0.838178 -0.139718  0.879800  0.896918
9   0.923414  0.938578 -0.049102  0.960851
10
11 Delta1 =
12   2.298415 -0.082619 -0.074786
13   2.939691 -0.107533 -0.161585
14
15 Delta2 =
16   2.65025  1.37794  1.43501
17   1.70629  1.03385  1.10676
18   1.75400  0.76894  0.77931
19   1.79442  0.93566  0.96699
20
21 z2 =
22   0.054017  0.166433
23  -0.523820 -0.588183
24   0.665184  0.889567
25
26 sigmoidGradient(z2)
27 ans =
28   0.24982  0.24828
29   0.23361  0.22957
30   0.22426  0.20640
31
32 a2 =
33   1.00000  0.51350  0.54151
34   1.00000  0.37196  0.35705
35   1.00000  0.66042  0.70880
36
37 a3 =
38   0.88866  0.90743  0.92330  0.93665
39   0.83818  0.86028  0.87980  0.89692
40   0.92341  0.93858  0.95090  0.96085
```

Test case without regularization (uses same data, but 0 for lambda):

```

1 >> [J grad] = nnCostFunction(nn, il, hl, nl, X, y, 0)
2 J = 7.4070
3 grad =
4     0.766138
5     0.979897
6    -0.027540
7    -0.035844
8    -0.024929
9    -0.053862
10     0.883417
11     0.568762
12     0.584668
13     0.598139
14     0.459314
15     0.344618
16     0.256313
17     0.311885
18     0.478337
19     0.368920
20     0.259771
21     0.322331
22

```

=====


Values for Delta1 and Delta2 (the unregularized gradient, from tutorial Step 5 and Step 6) - truncated to 3 decimal places, prior to scaling by 1/m.

```

1 Delta1 =
2     2.298 -0.082 -0.074
3     2.939 -0.107 -0.161
4
5 Delta2 =
6     2.650  1.377  1.435
7     1.706  1.033  1.106
8     1.754  0.768  0.779
9     1.794  0.935  0.966
10
11

```

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Results for unregulated test case:





```
1 a2 =
2 1.00000 0.51350 0.54151
3 1.00000 0.37196 0.55705
4 1.00000 0.66042 0.70880
5
6 a3 =
7 0.88866 0.90743 0.92330 0.93665
8 0.83818 0.86028 0.87980 0.89692
9 0.92341 0.93858 0.95090 0.96085
10
11 d3 =
12 0.888659 0.907427 0.923305 -0.063351
13 0.838178 -0.139718 0.879800 0.896918
14 0.923414 0.938578 -0.049102 0.960851
15
16 d2 =
17 0.79393 1.05281
18 0.73674 0.95128
19 0.76775 0.93560
20
21 Delta1/m =
22 0.766138 -0.027540 -0.024929
23 0.979897 -0.035844 -0.053862
24
25 Delta2/m =
26 0.88342 0.45931 0.47834
27 0.56876 0.34462 0.36892
28 0.58467 0.25631 0.25977
29 0.59814 0.31189 0.32233
30
```

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