

# Programming Exercise 4:

## Multi-class Classification and Neural Networks

### Machine Learning

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#### Question (1) (40 points)

Please compute the minimum cost found by **fmincg** function for all digits:  
(Please list the answer in order: 1, 2, 3 ... 9, 0)

Minimum cost =

[120.498365  
46.002181  
43.937000  
59.591510  
39.680365  
63.812244  
62.474704  
31.226487  
39.836797  
54.841540 ]

#### Question (2) (30 points)

Please compute the training set accuracy using one-vs-all logistic regression method:

Training set accuracy = 95.120000

**Question (3) (40 points)**

Please compute the training set accuracy with neural networks:

Training set accuracy = 97.520000