

CS 229 ASSIGNMENT 3:

Logistic Regression

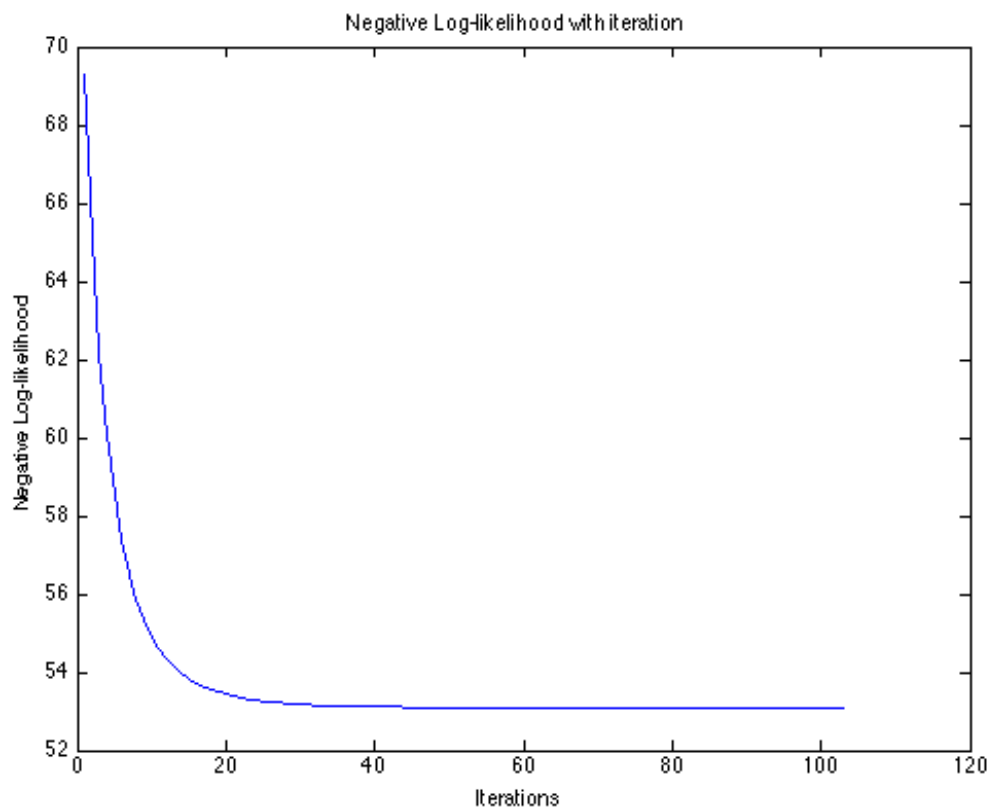
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The goal of this homework is to become familiar with logistic regression.

Task 1 – (50 points) Logistic Regression with Binary target

Implement the logistic regression algorithm for this binary classification problem.

- 1) Show the decreasing of NLL (negative log-likelihood) function with the increasing of iteration numbers.



- 2) Give the results of obtained coefficient, \mathbf{w}

$\mathbf{w} = \quad -0.7995 \quad 0.4577 \quad 0.2433 \quad 0.8116$

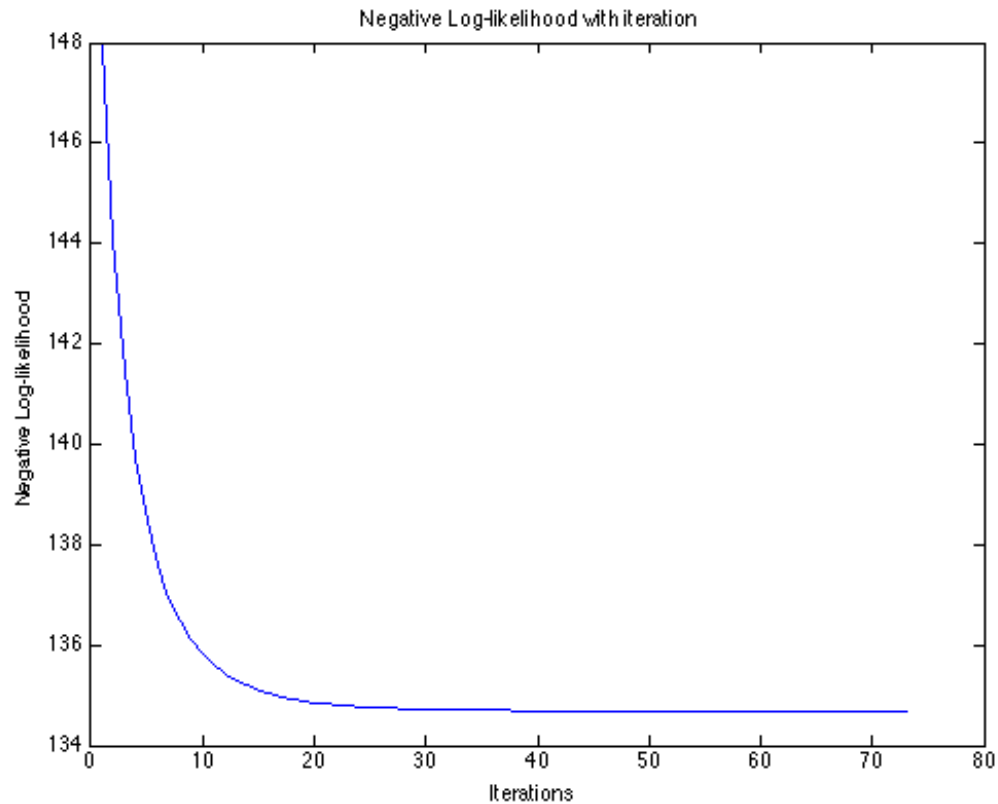
- 3) How many target labels of test data are correctly predicted by the learned \mathbf{w} ?
50 out of 70 test data are predicted correctly.

right_ratio = 0.7000

Task 2 – (50 points) Multi-class Logistic Regression

Implement the logistic regression algorithm for this multi-class classification problem.

- 1) Show the decreasing of NLL (negative log-likelihood) function with the increasing of iteration numbers.



- 2) Give the results of obtained coefficient, \mathbf{w}

$\mathbf{w} =$

0.4681	-0.0836	-0.3845
-0.2806	0.0251	0.2555
0.0632	-0.3694	0.3062
-0.2023	-0.2479	0.4501

- 3) How many target labels of test data are correctly predicted by the learned \mathbf{w} ?
56 out of 120 test data are predicted correctly.

right_ratio = 0.4667