

# Technical Report 3: Logistic Regression and Newton's Method

## 1 Plot The Data

The data set and the decision boundary are illustrated in Fig. 1. It can be observed that, the boundary well separates the positive data samples from the negative ones.

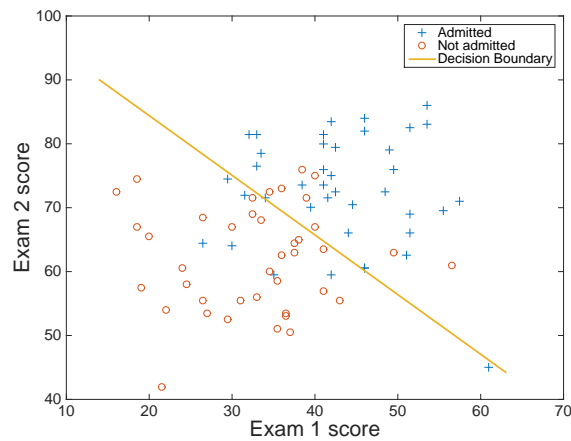


Figure 1: Data set and decision boundary.

## 2 Newton's Method

Through Newton's method, the final values of  $\theta$  are  $\theta_0 = -16.3787$ ,  $\theta_1 = 0.1483$ , and  $\theta_2 = 0.1589$ . We show the convergence of the Newton's method in Fig. 2. It is demonstrated that, the Newton's method achieves convergence in only 5 iterations. Recall that, in our previous experiments, the gradient descent method took hundreds or even thousands of iterations to converge. The Newton's method is much faster.

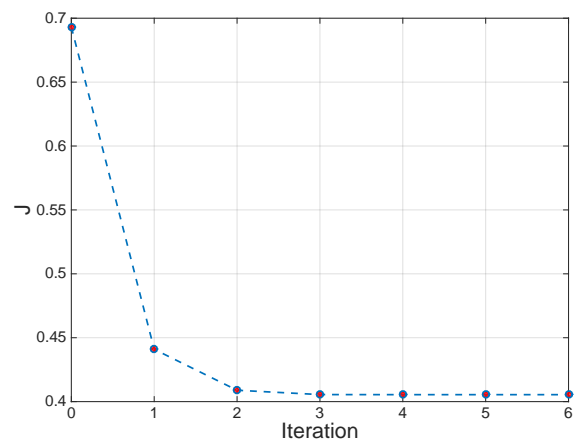


Figure 2: Convergence.