Logistic Regression Classifier Implementation on the Wine Dataset

Status Report 1

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Project Update

The project team decided to use the code base from Assignment 5, which contains Dr. Dave's implementation of the Perceptron Classifier. The team modified the Perceptron Classifier to obtain the Logistic Regression Classifier, and the implementation process is now complete. The classifier currently supports only binary classification. The Multiclass classification feature will be added by November 23. Currently, the team has added the option of Logistic Regression to the classifier factory, which is the first step of implementing multiclass classification.

To verify the correctness of the classifier, the team adapted the default dataset from Assignment 1 - which is a simple dataset containing 10 examples, each with 3 binary features - and performed weight updates by hand on the first 3 examples. The team has verified that their Logistic Regression Classifier works correctly.

Results

Phase 1 of the project is to implement the classifier, and the experimentation is for the later phases. There are not many results at this point. The only ones the project team has are:

- If all 10 examples are used for training, the accuracy on the training set after a single iteration is 70%, meaning that 7/10 examples are classified correctly. This indicates that the classifier is functional to the extent that it is better than guessing randomly.
- The team has manually performed the weight updates on the first 3 examples and found consistent results with the classifier. The team is now more confident that their implementation is correct.

Problems

The project is currently progressing smoothly, and the project team does not expect major issues at the current stage. One potential challenge is that, during the next stage of the project when the team is going to fix their AVA/OVA classifiers, they might spend a considerable amount of time debugging. Meanwhile, there could be some compatibility issues when the team integrates their LR classifier with AVA/OVA.

Hours

The team worked collaboratively for 4.5 hours on November 16, from 6:00PM - 10:30PM.

Code

The repository is attached here.