HW2: SGD implementation and cross-validation

100/100 Points

9/20/2024

Attempt 3

Review Feedback
9/18/2024

Attempt 3 Score:
100/100

View Feedback

Anonymous Grading: **no**

Unlimited Attempts Allowed

Details

In this homework, we will put all ML concepts and components together by solving the wine quality prediction problem. We will improve the GD optimization approach and implement the SGD optimization (mini-batch) approach. Use the attached code as your template to complete this homework and submit it by .

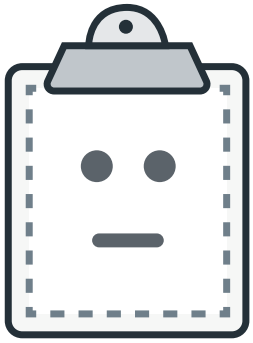
Specific requirements:

1. Use all function definitions given in the code (e.g., def SGD(X, Y, lr = 0.001, batch_size = 32, epoch = 100):); and do not change the function names and input arguments. (deduct 5 points for doing this)
2. Evaluate (Cross-validation) the model trained using GD. 25 points
    - Use the normalized data X1 when you call the train_test_split function
3. SGD implementation. 35 points
4. Calculate and print out the MSE and MAE values of SGD for the training and test sets. 15 points
    - MSE is the mean-square-error: 1/n *(sum(y_hat-y_true)^2)
    - MAE is the mean-absolute-error 1/n *(sum(abs(y_hat-y_true)))
5. Plot the loss curve of the SGD. 5 points
    - Plot the values in loss_hist_SGD; and the horizontal axis is epoch.
6. Plot the MSE curves on the training and test sets using different models (w_hist). 20 point

Attachments

- Code template: **Homework 2_SGD_stu_v2.ipynb (https://canvas.uidaho.edu/courses/30734/files/3370309?wrap=1)** **(https://canvas.uidaho.edu/courses/30734/files/3370309/download?download_frd=1)**
- Data file: **winequality-white.csv (https://canvas.uidaho.edu/courses/30734/files/3268209?wrap=1)** **(https://canvas.uidaho.edu/courses/30734/files/3268209/download?download_frd=1)**

(https://canvas.uidaho.edu/courses/30734/files/3268122/preview)



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Homework 2_SGD_stu_v2_Andrew_Plum-3.ipynb

Download

(https://canvas.uidaho.edu/files/3398117/download?download_frd=1&verifier=r9HTR69L5q0oEGksAoU6ngu1AsW8AzZXEtgi4KLN)

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