

11310CS460200 Intro 2 ML Lab 3

Name	Date
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State the possible reason why the accuracy or F1-score change between Perceptron and LDA?

- The Perceptron method may not converge if the data is not linearly separable. In this case, the Perceptron cannot reach a decent model, leading to lower accuracy and F1-score.
- On the other hand, LDA tries to find the best separation between classes. Thus, LDA still works when data isn't linearly separable.
- Also, data distribution affects Perceptron and LDA differently, as does their sensitivity to outliers. This results in different behavior of models trained by these methods.

Does MAP help? Why?

- In general, MAP helps LDA achieve better performance because MAP considers prior knowledge (probabilities). If the data is imbalanced, MAP can make adjustments using this prior information.

Difficulty I encountered

- Calculation of S_W : The summation of S_W wasn't intuitive for me to translate into code.
 - How I solved it: I wrote the formula on paper and tried to write the matrix version of the summation.
- Normalize the vector: It took a while to figure out how to normalize the vector using `np.linalg.norm`.
 - How I solved it: It just took some time to search for the normalization method using `norm`.

My reflections

- This lab gives a clearer explanation and description than before. The progress of this lab is very smooth. Nice!