Classification on Colab using MNIST dataset

CS550 - Machine Learning and Business Intelligence

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Table of Content

- Introduction
- Design
- Implementation
- Test
- Enhancement Ideas
- Conclusion
- References

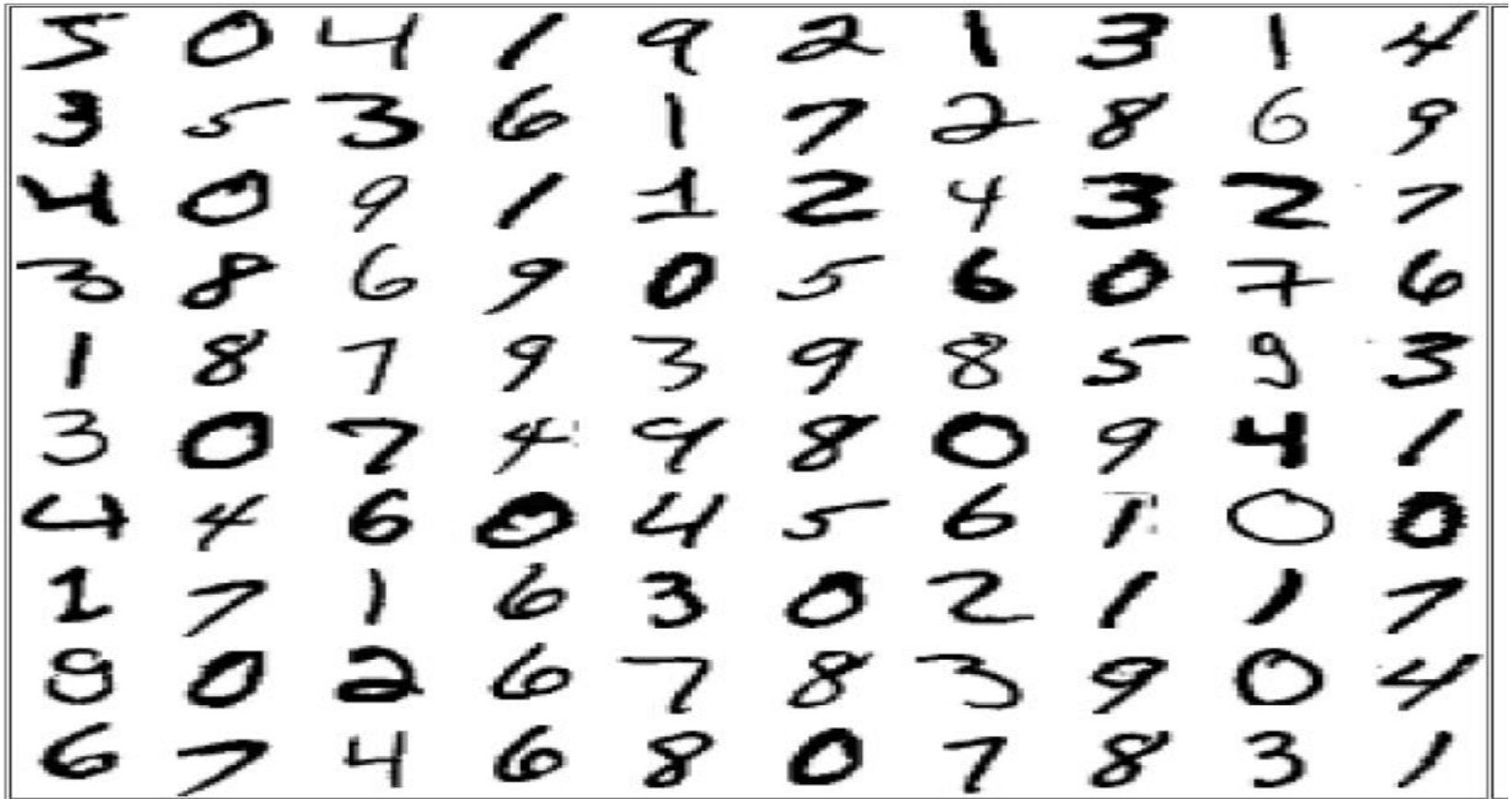
Introduction

★ The MNIST database is a large database of handwritten digits that is commonly used for training various image processing systems.

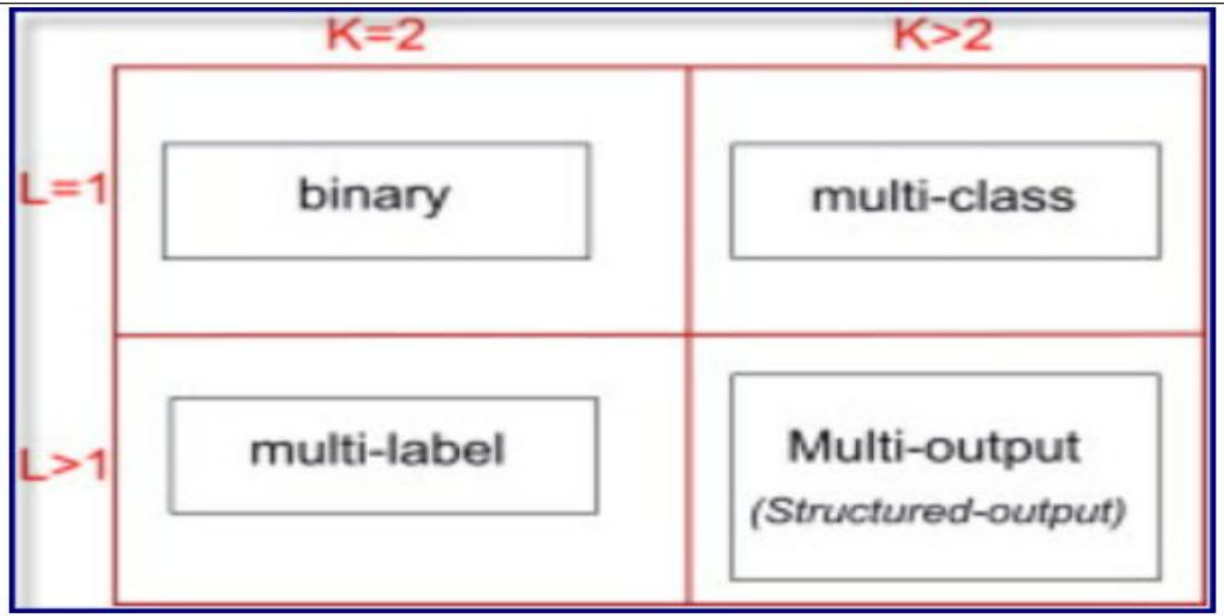
★ This dataset is one of the most common datasets used for image classification and accessible from many different sources.

1.

Design

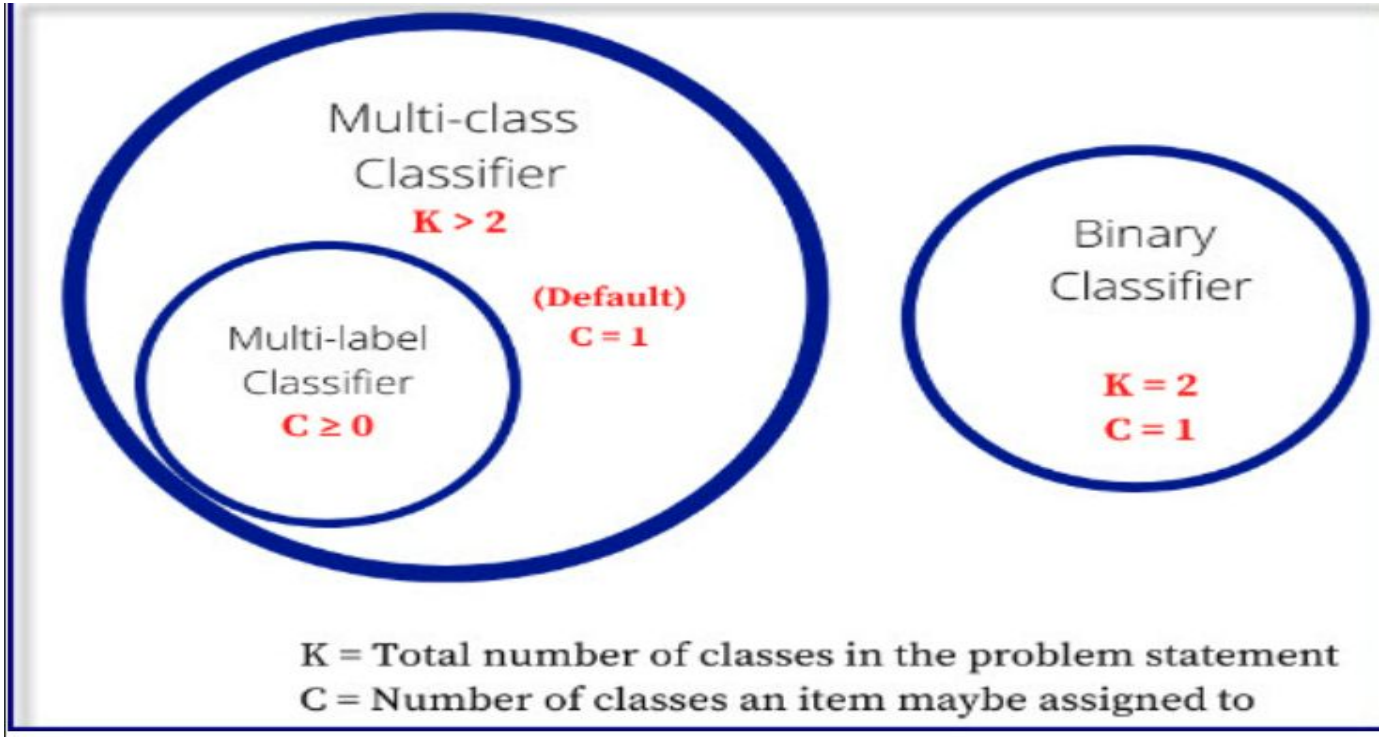


Design



Scalable multi-output label prediction: From classifier chains to classifier trellises

Design



Multiclass v/s Multilabel classification

Design

Low Accuracy
High Precision
High Accuracy
Low Precision
High Accuracy
High Precision

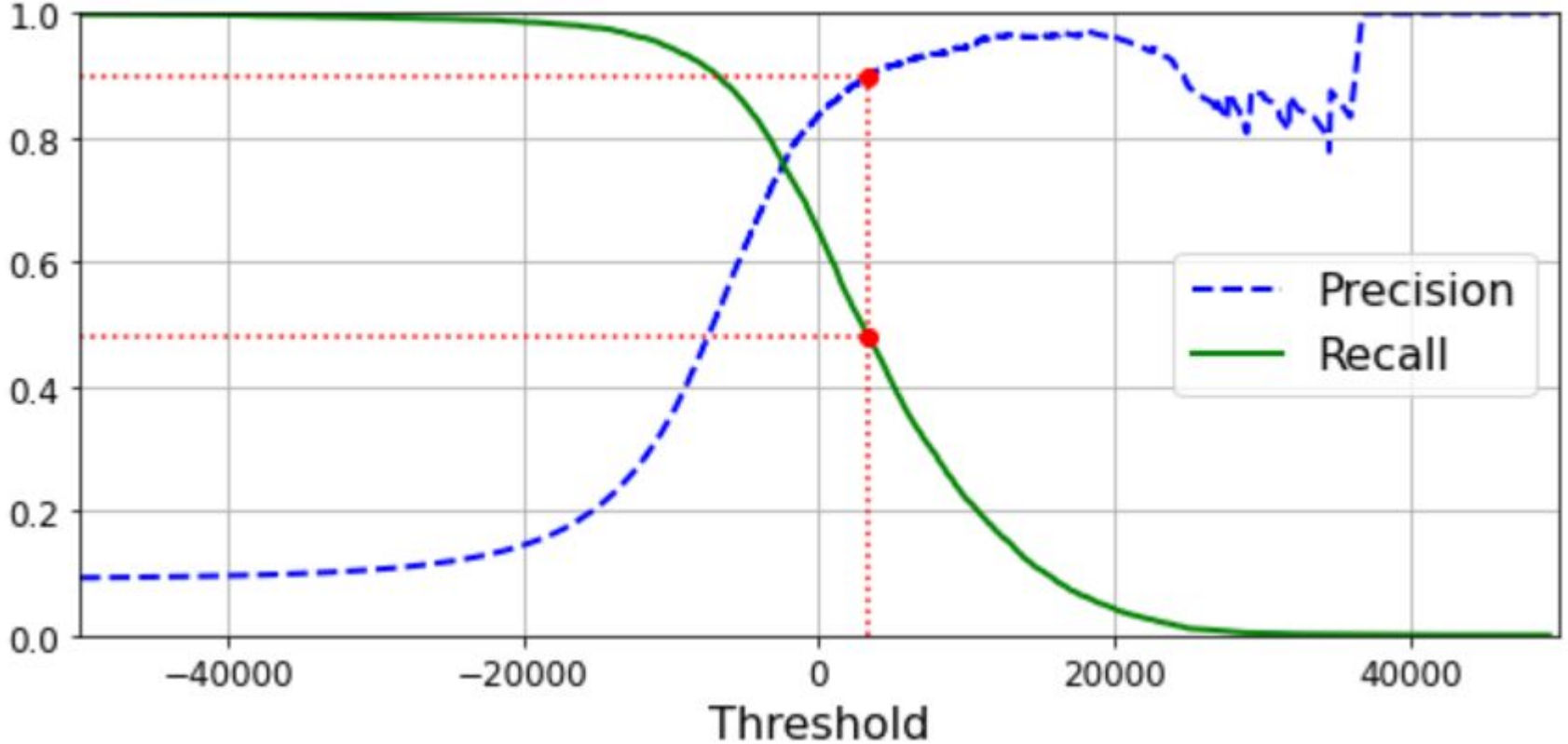
Implementation

- ★ Go to Colab
- ★ Execute classification.ipynb

Test

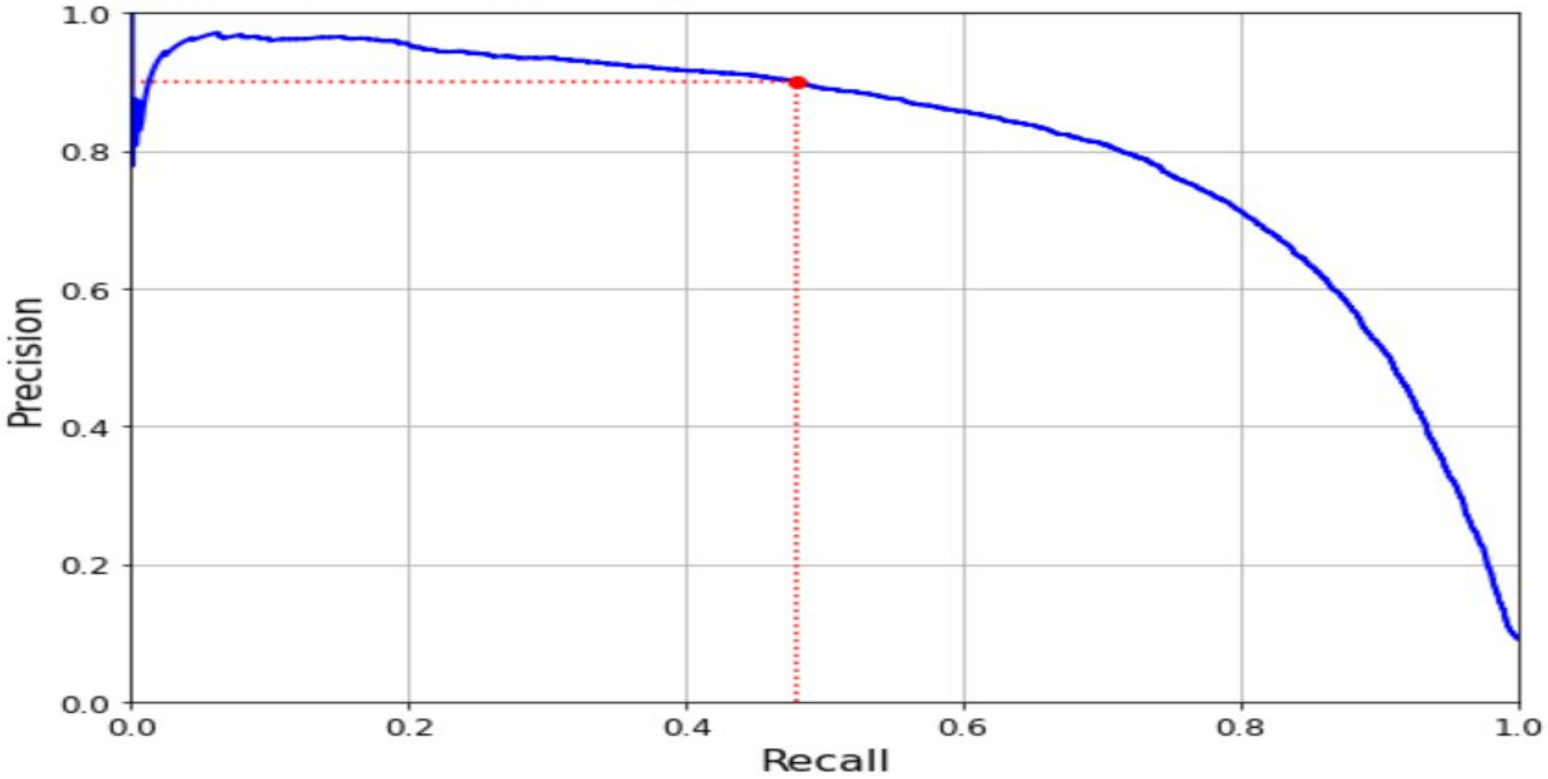
Test

Saving figure precision_recall_vs_threshold_plot



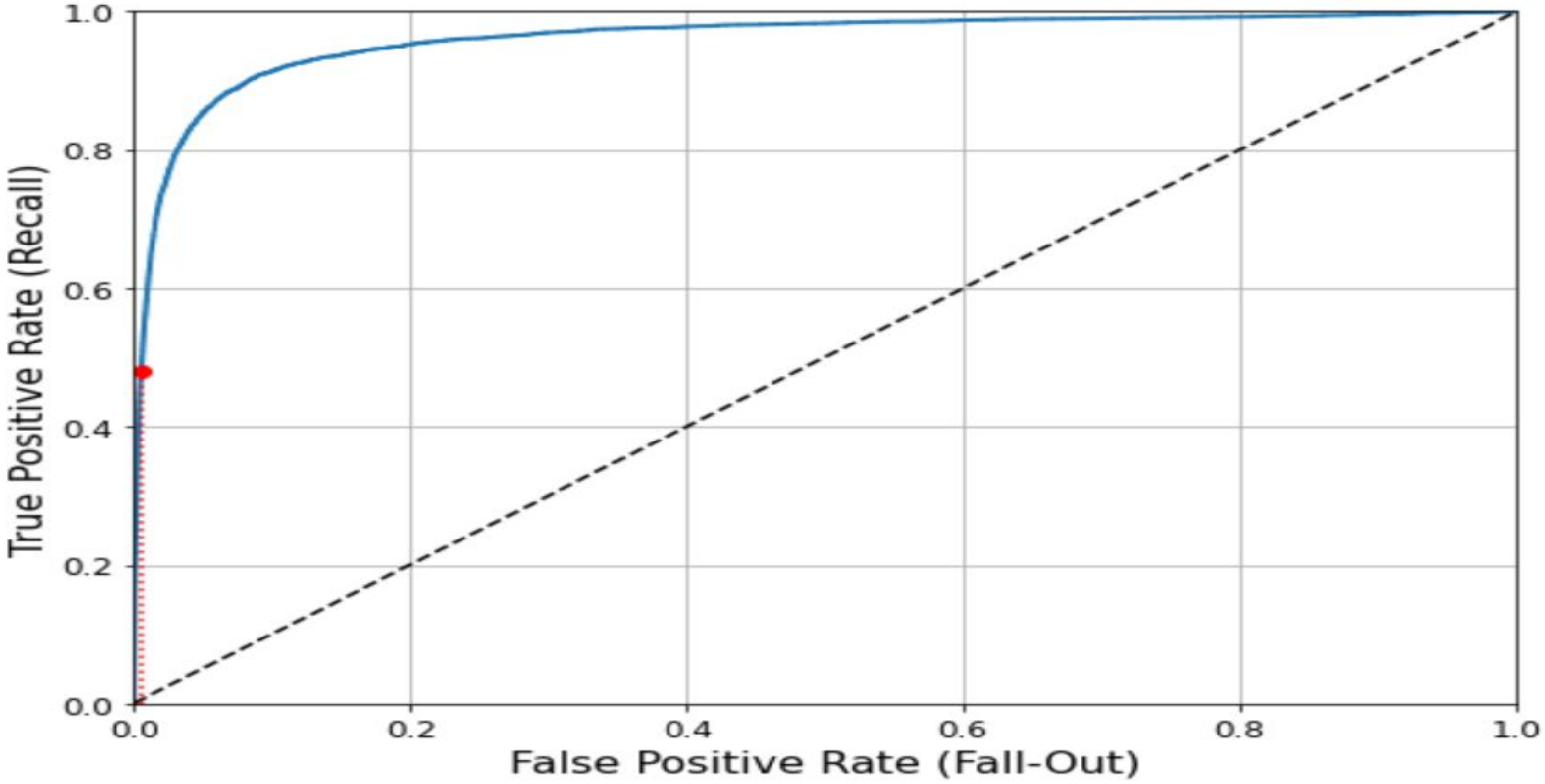
Test

Saving figure precision_vs_recall_plot

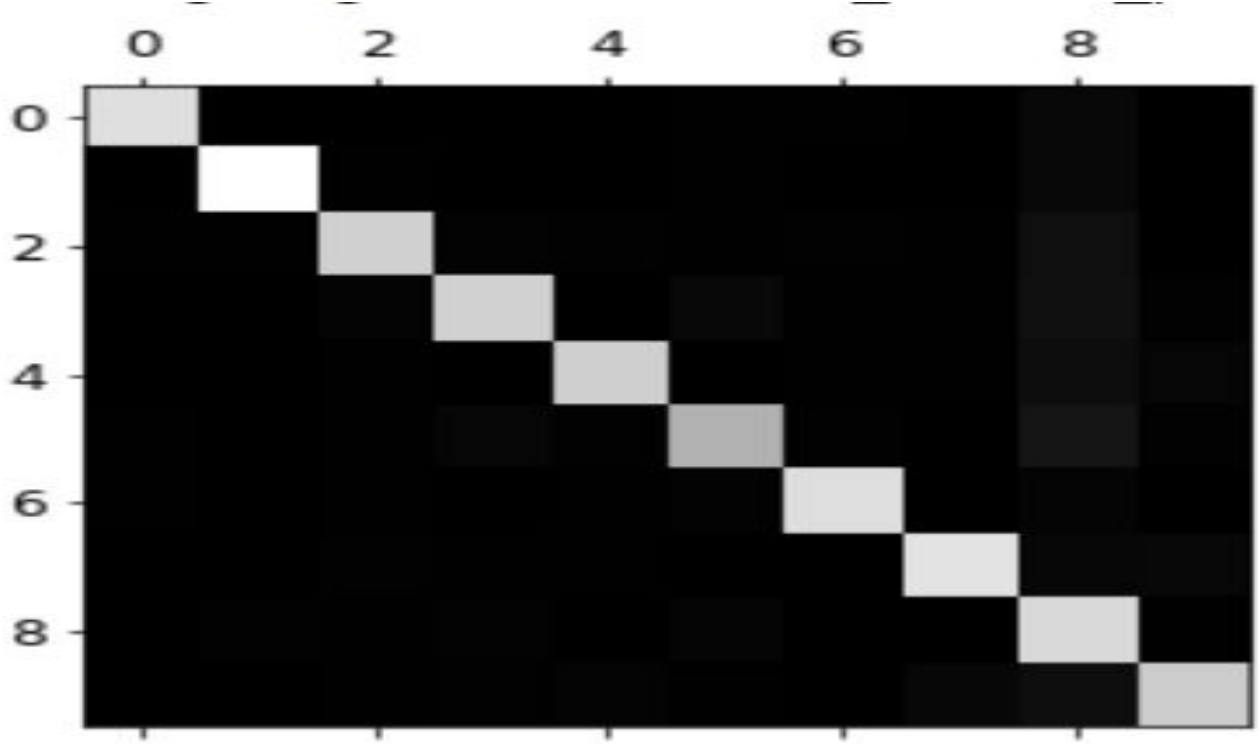


Test

Saving figure roc_curve_plot



Test



Enhancement Ideas

- We can use Batch normalization technique that normalizes the activations of the layers in the model, making the training process more stable and faster. We can try adding batch normalization layers to the model to improve its performance.

Conclusion

- By using the MNIST dataset, we can easily train and evaluate a model that can recognize handwritten digits. The enhancements discussed in this answer, such as changing the model architecture, adding regularization, using data augmentation, and performing hyperparameter tuning, can help you improve the performance of the model.

GitHubLink

★ https://github.com/divyapandey03/Machine-Learning/tree/main/Supervised%20Learning/Classification%20on%20Colab%20using%20MNIST%20dataset

References

★ *Tracyrenee. (2021, January 08). Getting to grips with the MNIST dataset using Google Colab. Retrieved February 12, 2023, from https://ai.plainenglish.io/getting-to-grips-with-the-mnist-dataset-using-google-colab-6ab3207176e4*

★ *Yalçın, O. (2023, January 07). Image classification in 10 minutes with Mnist Dataset. Retrieved February 12, 2023, from https://towardsdatascience.com/image-classification-in-10-minutes-with-mnist-dataset-54c35b77a38d*