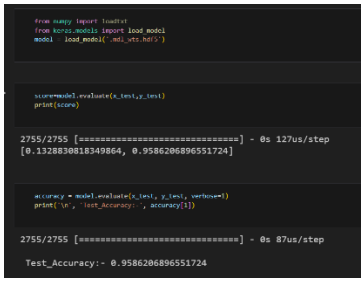
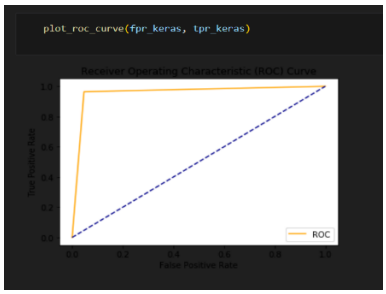
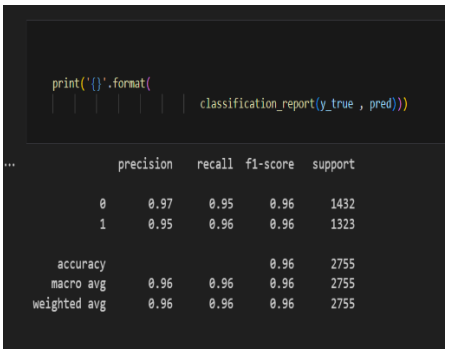
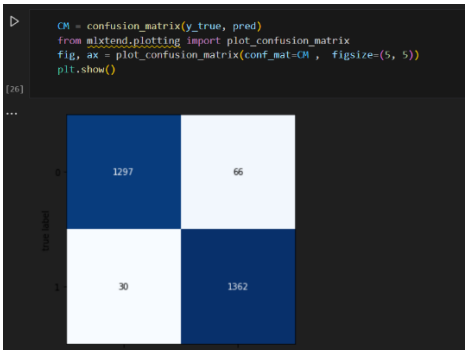
Model Optimization and Tuning Phase Template

Date	15 October 2024
Team ID	LTVIP2024TMID24772
Project Title	Implementation of Deep Learning Techniques to Detect Malaria
Maximum Marks	10 Marks

Model Optimization and Tuning Phase

The Model Optimization and Tuning Phase involves refining neural network models for peak performance. It includes optimized model code, fine-tuning hyperparameters, comparing performance metrics, and justifying the final model selection for enhanced predictive accuracy and efficiency.

Hyperparameter Tuning Documentation (8 Marks):

Model	Tuned Hyperparameters
CNN	   

Final Model Selection Justification (2 Marks):

Final Model	Reasoning
Model 1 (CNN)	The CNN model was chosen as the final optimized model due to its proven effectiveness in image classification tasks, particularly in medical imaging. Its architecture allows for automatic feature extraction, which is crucial for accurately identifying malaria-infected cells in blood smear images. The model's performance was further enhanced through hyperparameter tuning, including adjustments to the learning rate, batch size, dropout rate, and number of epochs. Additionally, the model showed high accuracy during validation, demonstrating its capability to generalize well to unseen data. The use of techniques such as data augmentation and one-hot encoding also contributed to reducing overfitting and improving classification performance. Overall, the CNN's robust architecture and favorable training metrics solidified its selection as the final model for this project.

Explanation:

- **Final Model**: Specifies the model that has been selected as the final version for deployment or reporting.