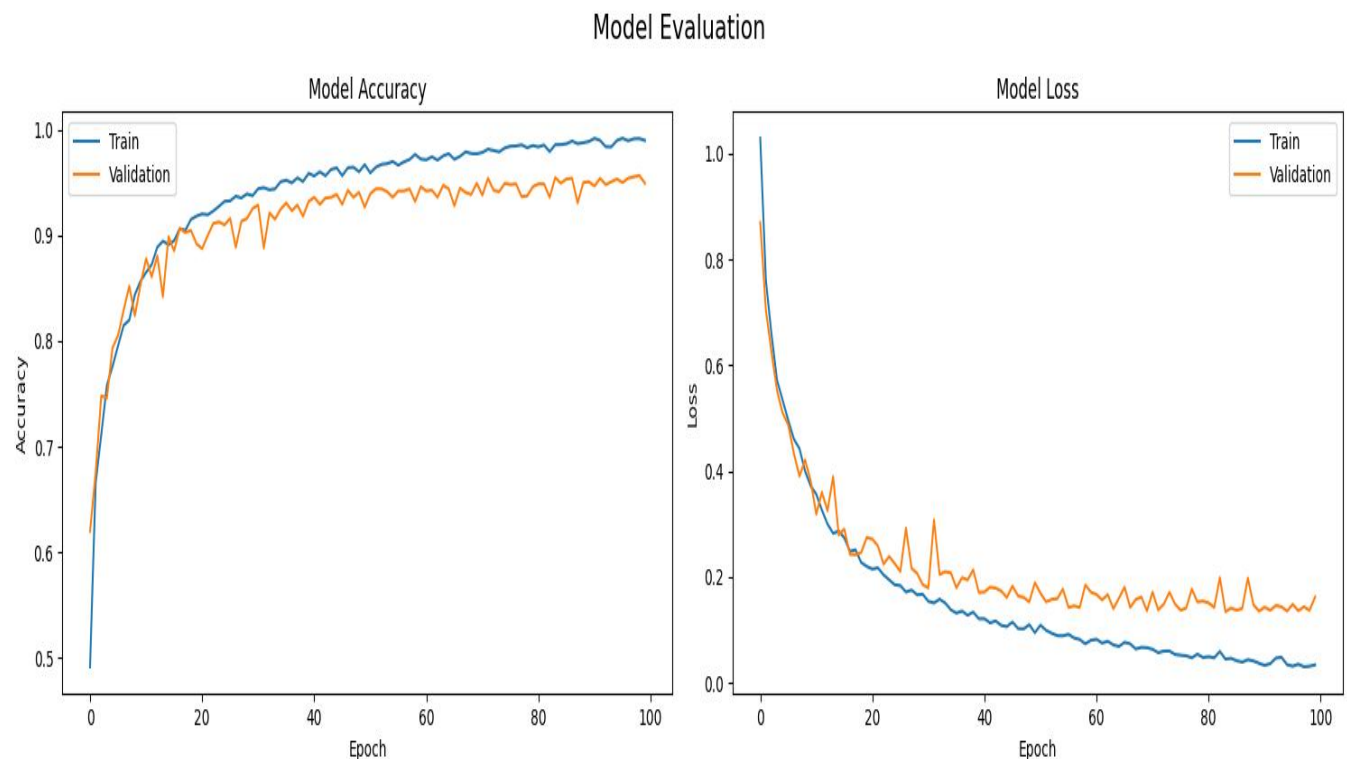


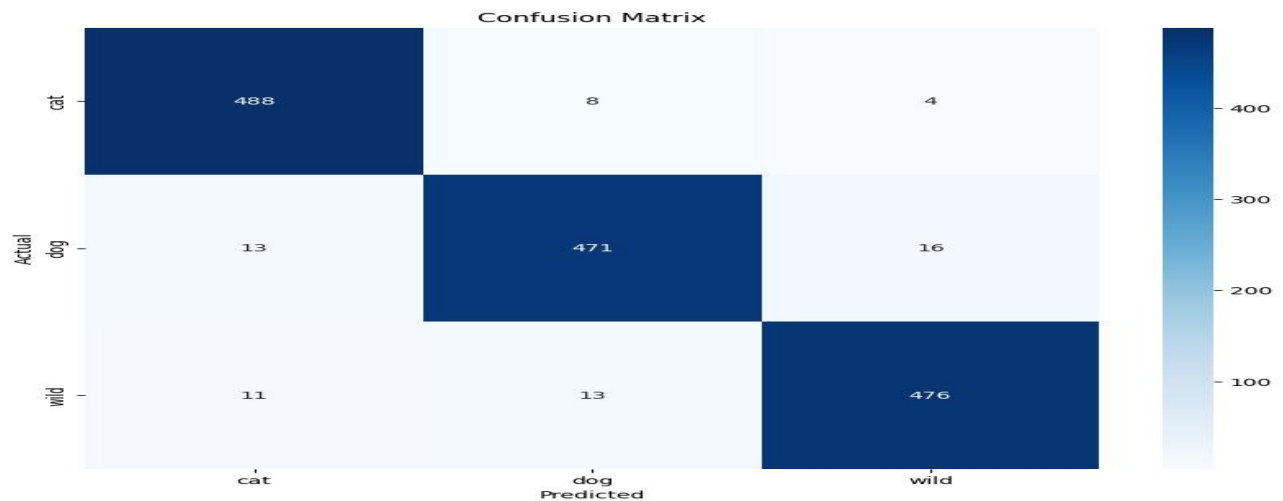
# Analysis and Critical Evaluation of Model Results

This report aims at analyzing and critically evaluating the performance of deep learning model for image classification. The model is designed to classify images into three different classes thus: Cat, Dog and Wild.

Model Evaluation and classification report: The evaluation of the model on the validation dataset, classification report and confusion matrix plots as shown below.



The model evaluation plots using losses and metrics(accuracy) show that the model trains well with high accuracy and low loss. The model starting to diverge after 60 epochs indicates the beginning of overfitting. Validation accuracy of over 90% indicates that the model is generalizing well to unseen data and tuning have to be applied to prevent overfitting.



Analysis and critical evaluation of the results: The model was able to achieve classification accuracy of 96%, correctly classified (488 for cat, 471 for dog, 476 for wild) out of the 500 samples each of the class.

The contributing factors of the model performance are:

- ✧ Class balance: The dataset comes with balanced distribution of classes (500). This helps in each class being represented equally during training. This also contributes in avoiding biases and over-fitting to dominant classes.
- ✧ Data quality: Model could learn distinguishing features of each class because of the quality and well-labeled images of the dataset.
- ✧ Data preprocessing and augmentation aslo played major role in the model performance. Preprocessing involves transforming data into suitable format as input to model. This includes: resizing, Normalization and and contrast adjustment  
Augumentation on the other hand is a technique used in applying transformation to increase the diversity of the training data like image zooming.

The confusion matrix reveals strong model performance with high accuracy in classifying cats, dogs, and wild, as shown by the high values on the diagonal. The low misclassification rates suggest effective feature learning and generalization capabilities. Occasional errors, like dog being confused with wild and vice versa provide specific avenues for model refinement. Overall, the model excels at correct classifications with room for improvement in distinguishing similar features across classes.