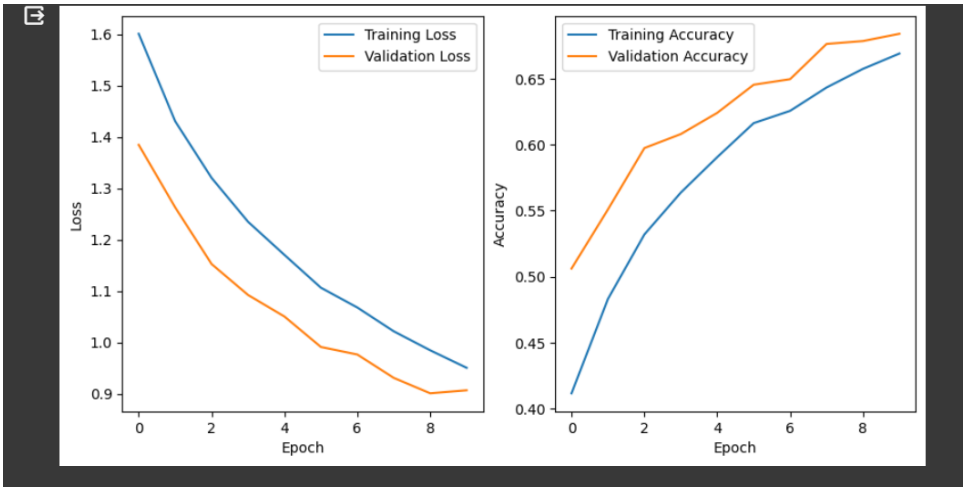
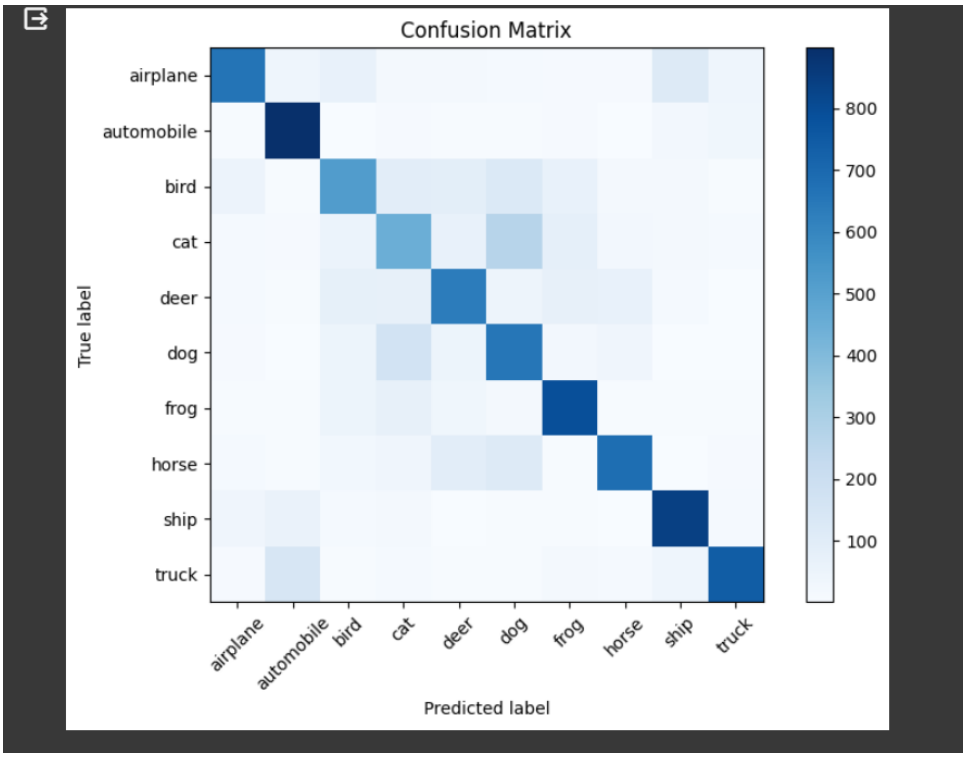
- how does the proposed solution handle edge cases?
- can you provide more context on this topic?
- discuss the implications of using a particular method or technique.
- what are the advantages and disadvantages of using a certain library or framework?
- compare and contrast different approaches to achieve the same goal.
- how would you handle errors or exceptions in this scenario?
- can you elaborate on the reasoning behind your recommendation?
- what considerations should be taken into account when implementing this feature?
- Basic architecture of Row LSTM or Diagonal BiLSTM
- What Training parameters should i use in this problem and my scenario
- Which Loss calculation and optimization should i use in this scenario
- how can i modify the model architecture
- clarification on requirements for model modifications
- Pick random sample of 10 images from each class.
- How can i split the dataset into training, validation, and testing sets.
- What are the best hyperparameter tuning to select the optimal values for its hyperparameters
- Plotting the training and validation loss and accuracy.
- How can i calculate the Accuracy, precision, recall, f1-score, Top-5 Accuracyp of the binary classification
- how to find Receiver Operating Characteristic (ROC) Curve and Area Under the Curve (AUC) for multiclass dataset



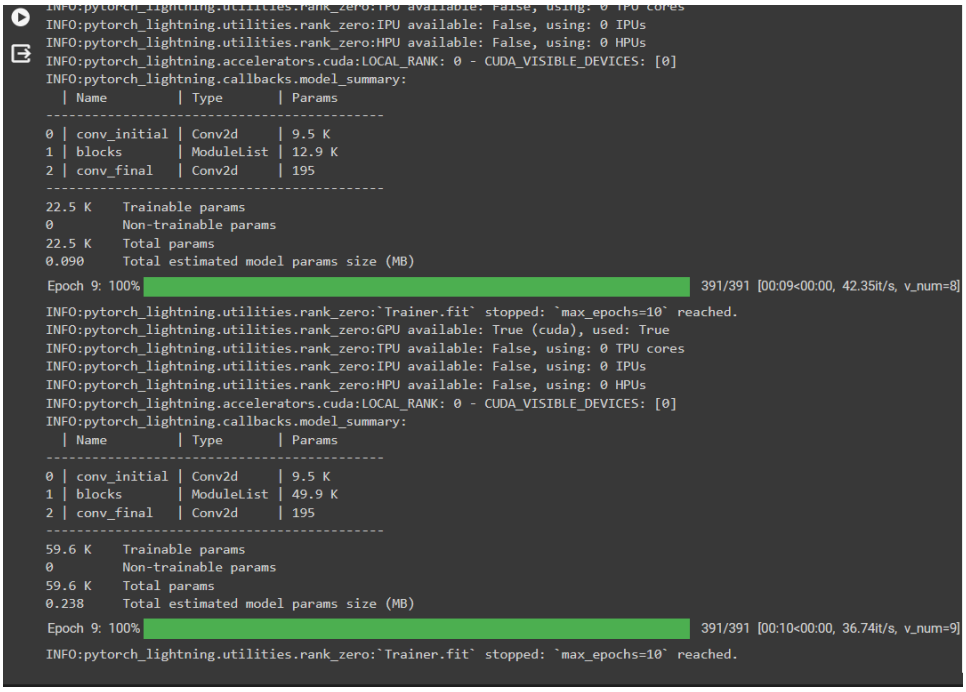
```
                precision    recall  f1-score   support

      airplane       0.80      0.66      0.72      1000
    automobile       0.76      0.90      0.82      1000
          bird       0.60      0.52      0.56      1000
           cat       0.47      0.45      0.46      1000
          deer       0.63      0.63      0.63      1000
           dog       0.52      0.65      0.58      1000
          frog       0.73      0.79      0.76      1000
         horse       0.78      0.68      0.73      1000
          ship       0.77      0.84      0.81      1000
         truck       0.85      0.74      0.79      1000

      accuracy                           0.69     10000
     macro avg       0.69      0.69      0.69     10000
  weighted avg       0.69      0.69      0.69     10000
```

```
1 #confusion matrix
2 conf_matrix = confusion_matrix(y_true_classes, y_pred_classes)
3 print("Confusion Matrix:")
4 print(conf_matrix)
```

```
Confusion Matrix:
[[660  40  66  19  16  15  11  11 119  43]
 [  7 898   1   9   7   5  11   3  23  36]
 [ 51   7 517  94  92 124  71  21  16   7]
 [ 12  11  57 448  68 266  81  25  18  14]
 [ 12   5  75  72 633  46  72  67  15   3]
 [ 10   2  49 169  48 653  24  39   3   3]
 [  8   7  47  73  36  17 792   8   7   5]
 [ 14   6  29  39  93 117   8 681   2  11]
 [ 38  60  14  19   3   6   6   2 839  13]
 [ 11 142   6  13   7   8  16  15  41 741]]
```




```
Files already downloaded and verified
Files already downloaded and verified
INFO:pytorch_lightning.utilities.rank_zero:GPU available: True (cuda), used: True
INFO:pytorch_lightning.utilities.rank_zero:TPU available: False, using: 0 TPU cores
INFO:pytorch_lightning.utilities.rank_zero:IPU available: False, using: 0 IPUs
INFO:pytorch_lightning.utilities.rank_zero:HPU available: False, using: 0 HPUs
INFO:pytorch_lightning.accelerators.cuda:LOCAL_RANK: 0 - CUDA_VISIBLE_DEVICES: [0]
INFO:pytorch_lightning.callbacks.model_summary:
  | Name         | Type       | Params
--------------------------------------------
0 | conv_initial | Conv2d     | 9.5 K
1 | blocks       | ModuleList | 12.9 K
2 | conv_final   | Conv2d     | 195
--------------------------------------------
22.5 K    Trainable params
0         Non-trainable params
22.5 K    Total params
0.090     Total estimated model params size (MB)
Epoch 9: 100% 391/391 [00:11<00:00, 35.09it/s, v_num=7]
INFO:pytorch_lightning.utilities.rank_zero:`Trainer.fit` stopped: `max_epochs=10` reached.
INFO:pytorch_lightning.utilities.rank_zero:GPU available: True (cuda), used: True
INFO:pytorch_lightning.utilities.rank_zero:TPU available: False, using: 0 TPU cores
INFO:pytorch_lightning.utilities.rank_zero:IPU available: False, using: 0 IPUs
INFO:pytorch_lightning.utilities.rank_zero:HPU available: False, using: 0 HPUs
INFO:pytorch_lightning.accelerators.cuda:LOCAL_RANK: 0 - CUDA_VISIBLE_DEVICES: [0]
INFO:pytorch_lightning.callbacks.model_summary:
  | Name         | Type       | Params
--------------------------------------------
0 | conv_initial | Conv2d     | 9.5 K
1 | blocks       | ModuleList | 12.9 K
2 | conv_final   | Conv2d     | 195
--------------------------------------------
22.5 K    Trainable params
0         Non-trainable params
```


INFO:pytorch_lightning.utilities.rank_zero:IPU available: False, using: 0 IPUs
INFO:pytorch_lightning.utilities.rank_zero:HPU available: False, using: 0 HPUs
INFO:pytorch_lightning.accelerators.cuda:LOCAL_RANK: 0 - CUDA_VISIBLE_DEVICES: [0]
INFO:pytorch_lightning.callbacks.model_summary:
| Name | Type | Params
0 | conv_initial | Conv2d | 9.5 K
1 | blocks | ModuleList | 12.9 K
2 | conv_final | Conv2d | 195
22.5 K Trainable params
0 Non-trainable params
22.5 K Total params
0.090 Total estimated model params size (MB)
Epoch 9: 100% 391/391 [00:09<00:00, 42.35it/s, v_num=8]
INFO:pytorch_lightning.utilities.rank_zero:`Trainer.fit` stopped: `max_epochs=10` reached.
INFO:pytorch_lightning.utilities.rank_zero:GPU available: True (cuda), used: True
INFO:pytorch_lightning.utilities.rank_zero:TPU available: False, using: 0 TPU cores
INFO:pytorch_lightning.utilities.rank_zero:IPU available: False, using: 0 IPUs
INFO:pytorch_lightning.utilities.rank_zero:HPU available: False, using: 0 HPUs
INFO:pytorch_lightning.accelerators.cuda:LOCAL_RANK: 0 - CUDA_VISIBLE_DEVICES: [0]
INFO:pytorch_lightning.callbacks.model_summary:
| Name | Type | Params
0 | conv_initial | Conv2d | 9.5 K
1 | blocks | ModuleList | 49.9 K
2 | conv_final | Conv2d | 195
59.6 K Trainable params
0 Non-trainable params
59.6 K Total params
0.238 Total estimated model params size (MB)
Epoch 9: 100% 391/391 [00:10<00:00, 36.74it/s, v_num=9]
INFO:pytorch_lightning.utilities.rank_zero:`Trainer.fit` stopped: `max_epochs=10` reached.