LEVEL 1
Baseline Image Classification (Transfer Learning)

Problem Statement : To build a baseline image classification model using transfer learning on CIFAR-10 dataset for the Terafac ML placement challenge.

Dataset & Split Strategy :

Dataset: CIFAR-10
Total Images: 60,000

As per Terafac dataset split requirement (80-10-10):

Split	Images	Source
Train	40,000	From CIFAR-10 training set
Validation	5,000	From CIFAR-10 training set
Test	10,000	Official CIFAR-10 test set

Model Architecture :

Model Used: ResNet18 (Pretrained on ImageNet)
Framework: PyTorch
Input Size: 224 × 224
Output Classes: 10

The final fully connected layer was replaced from 1000 classes to 10 classes to adapt the model for CIFAR-10 classification.

Training Configuration :

- Optimizer: Adam
- Learning Rate: 0.0001
- Loss Function: CrossEntropyLoss
- Batch Size: 64
- Epochs: 5

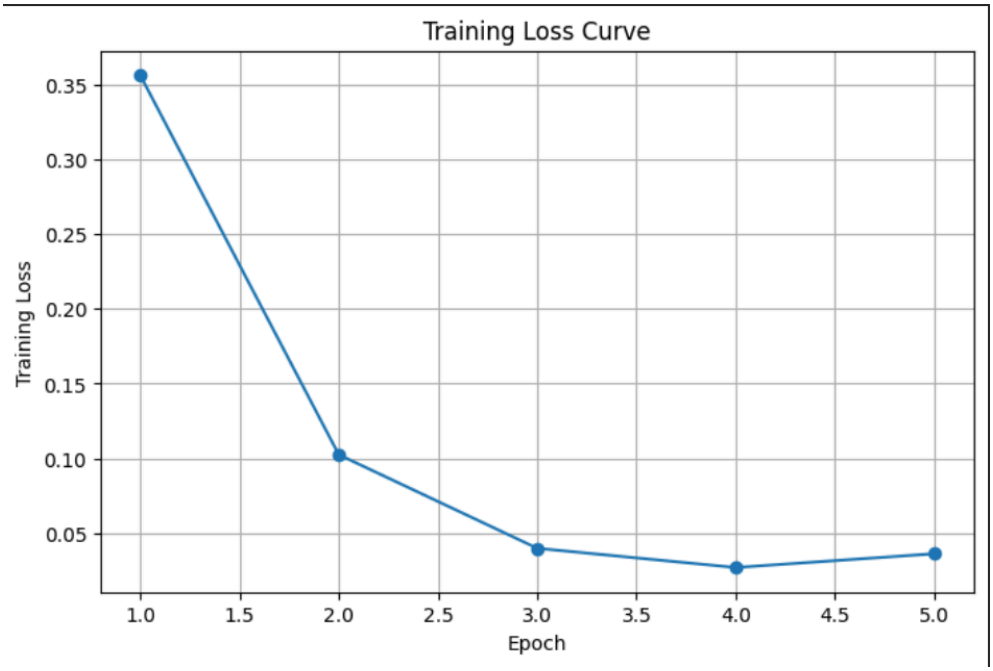
No hyperparameter tuning or data augmentation was used, as this is a baseline implementation.

Results :

```
...  ========================================
     MODEL EVALUATION RESULT (LEVEL 1 BASELINE)
     ========================================
     Test Accuracy: 93.54%
```

Plot:

Training Curve



Observations :

- The model converges rapidly within the first few epochs due to pretrained ImageNet weights.
- Loss decreases significantly from the first to second epoch, showing effective feature transfer.
- Training stabilizes after epoch 3, indicating good convergence.
- No signs of divergence or instability are observed.

This confirms that the baseline ResNet18 model is learning meaningful features from the CIFAR-10 dataset.

Colab Notebook Link:

- Terafac_ML_Test_Level1-3.ipynb