Assignment – Convolutional Neural Networks

Description

In our previous sessions we have spent time to understand how to build a CNN ground up using Tensorflow as well as pretrained models. In this assignment you will do both the above on a given dataset and evaluate the performance of a model based on that

Dataset

CIFAR 10 dataset from Keras. Use the below code to load the data

```
from tf.keras.datasets.cifar10 import load_data
(x_train, y_train), (x_test, y_test) = load_data()
```

Task

1. Custom Trained CNN
    a. Train a CNN model using Keras Tensorflow ground up
    b. Tune the models hyperparameters
        i. #Layers
        ii. #Units
        iii. Epochs
        iv. Learning Rate
        v. Optimizers etc.
    c. Track the following metrics on Train and Validation sets
        i. Loss
        ii. Accuracy
        iii. AUC
        iv. Time taken to tune
2. Using a Pretrained Model
    a. Load a pretrained model like VGG16 or Resnet50
    b. Finetune the last 2/3 layers using a small part of the CIFAR10 dataset (20 percentage or so)
    c. Track the following metrics on Train and Validation sets
        i. Loss
        ii. Accuracy
        iii. AUC
        iv. Time taken to tune
3. Compare the results
    a. Now compare the results and populate the following table

Approach	Accuracy	AUC	Time Taken
Custom CNN Model			
Pretrained Model			

Document your understanding from the above results