Assignment 02 (15 Marks)

PART A: Deep Neural Network (DNN) Implementation (8 Marks)

Objective: Build and train a Deep Neural Network (DNN) using TensorFlow/Keras or PyTorch for a classification task.

Instructions:

1. Code Implementation:
    - Use only DNN/Dense layers to construct your model. Do not strictly use CNNs, RNNs, or other advanced layers.
    - Choose one dataset from the following built-in TensorFlow or PyTorch datasets (such as):

        1. Dataset: CIFAR10 small image classification
        2. Dataset: Classify the flowers
        3. Dataset: horses or humans - A large set of images of horses
        4. Dataset: IMDB Movie reviews sentiment classification
        5. Dataset: Plant leaves
        6. Dataset: Fashion-MNIST database of fashion articles
        7. Dataset: cats vs dogs - A large set of images of cats
        8. Dataset: Large Yelp Review Data

Submission:

- Follow the provided **Part 2A Template** for structuring your notebook.
- Submit both:
    - The Jupyter/Colab Notebook file (DL_assignment_2A_group##.ipynb)
    - Its PDF version (DL_assignment_2A_group##.pdf).
    - Ensure proper formatting, alignment, and comments in your code.

Part B: Research Paper Implementation (7 Marks)

Objective: Reproduce the methodologies of a research paper using TensorFlow/Keras or PyTorch.

Instructions:

1. **Paper Selection:**
    - Choose a top-tier conference/journal paper (2022–2025) that focuses on:
        - Convolutional Neural Networks (CNNs)
        - Recurrent Neural Networks (RNNs)
        - Gated Recurrent Units (GRUs)
        - Long Short-Term Memory Networks (LSTMs)
        - Time Series Analysis using CNNs/RNNs
    - Provide a summary of the paper in your notebook, detailing:
        - The paper's objectives
        - The methodologies/algorithms implemented
        - The significance of the study

2. **Implementation:**
    - Use datasets from the research paper or any **publicly available datasets** that are similar (provide the dataset URL in your notebook).
    - Follow the provided **Part B Template** for structuring your notebook.
    - Submit both:
        - The Jupyter/colab Notebook file (DL_assignment_2_group##.ipynb)
        - Its PDF version (DL_assignment_2_group##.pdf).

Submission Guidelines

- Combine all files into a **single ZIP file** named DL_assignment_02_group##.zip, containing:
    - Part A: .ipynb and .pdf
    - Part B: .ipynb and .pdf
- Late submissions incur a **-2 marks penalty**, and plagiarism results in **zero marks**.