**Deep Learning Assignment: CIFAR-10 Classification using TensorFlow**

**Objective:** The objective of this assignment is to build, train, and evaluate a basic convolutional neural network (CNN) on the CIFAR-10 dataset using TensorFlow.

**Dataset:** CIFAR-10 is a dataset of 60,000 32x32 color images in 10 classes, with 6,000 images per class. There are 50,000 training images and 10,000 test images.

**Steps:**

1. **Setup and Import Libraries**
   * Import the necessary libraries and dependencies.
2. **Load and Preprocess the CIFAR-10 Dataset**
   * Load the CIFAR-10 dataset.
   * Normalize the images.
3. **Build the CNN Model**
   * Define a convolutional neural network using TensorFlow's Keras API.
4. **Compile the Model**
   * Choose an optimizer, loss function, and metrics for evaluation.
5. **Train the Model**
   * Fit the model on the training data and validate it on the validation set.
6. **Evaluate the Model**
   * Evaluate the model's performance on the test set.
7. **Save the Model**
   * Save the trained model to disk.
8. **Load the Model**
   * Load the saved model for inference.
9. **Make Predictions**
   * Use the model to make predictions on new data.
10. **Visualize the Results**
    * Visualize some predictions and compare them with the actual labels.