**COMPUTER SCIENCE AND ENGINEERING PROJECT**

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**Title: Image Classification using Convolutional Neural Networks in Python**

**Code for CNN Model :**

A screenshot of a computer program

Description automatically generated

**Code for Training and Visualizing the CNN Model :**

A screenshot of a computer

Description automatically generated

**Output for Test Accuracy :**

**A screenshot of a computer

Description automatically generated**

* **Comparison between Training Accuracy and Validation Accuracy**
* **Comparison between Training Loss and Validation Loss**

**A screenshot of a computer screen

Description automatically generated**

**Code for loading the CIFAR-10 dataset :**

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Description automatically generated**

**Output for Visualising 25 random images from CIFAR-10 dataset :**

**A screenshot of a computer

Description automatically generated**

**Algorithm:**

1. **Data Collection and Preprocessing:**

- Collect labeled image dataset.

- Resize images to a fixed size.

- Normalize pixel values.

- Apply data augmentation techniques.

2. **Model Architecture Design:**

- Choose or design a CNN architecture.

- Configure the layers, activation functions, and pooling.

- Define dropout layers for regularization.

3. **Model Training and Evaluation:**

- Split the dataset into training, validation, and test sets.

- Train the CNN using training data.

- Monitor loss and accuracy during training.

- Evaluate the model on the validation and test datasets.

4. **Model Deployment:**

- Develop a web-based user interface for image classification.

- Implement error handling for user interactions.

5. **Documentation and Reporting:**

- Create comprehensive project documentation.

- Prepare user guidelines for the deployed system.

- Develop a presentation summarizing the project and results.