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The main purpose of this week was to work on artificial intelligence coding using lightning.ai libraries and cifar10 data.

CIFAR-10

CIFAR-10 is a collection of images widely used to train machine learning and computer vision algorithms. It consists of 60,000 32 x 32 color images consisting of 10 classes. Each class contains 6,000 images. The training set contains 50,000 images, while the testing sets contain 10,000 images.

The purposes for which CIFAR-10 is used are:

- For training machine learning and computer vision algorithms

CIFAR-10 is a widely used dataset for various machine learning and computer vision tasks, such as image classification, object detection, and image recognition. It can be used to test and evaluate new algorithms designed to perform these tasks.

- For machine learning research

CIFAR-10 is a popular dataset for machine learning research. It can be used to test and evaluate new machine learning techniques and algorithms.

CIFAR-10 can be used for a variety of machine learning and computer vision tasks, such as:

- Image classification

It can be used to determine whether images in CIFAR-10 belong to one of the 10 classes. For example, it can determine whether an image is an airplane, a car, a cat or a dog.

- Object detection

It can be used to find specific objects in images in CIFAR-10. For example, it can be used to find a car or a cat in an image.

- Image recognition

It can be used to match images from CIFAR-10 to previously seen images. For example, it can be used to determine whether an image belongs to an image in a database.

CIFAR-10 is a good collection of high quality and diverse images. Therefore, it is an ideal dataset for training and evaluating machine learning and computer vision algorithms.

Lightning

Lightning.ai is a PyTorch wrapper that simplifies the training, validation, and testing of machine learning models. It is a collection of tools and utilities that provide a high-level abstraction for common machine learning tasks, such as:

- Data loading and preprocessing: Lightning.ai provides data loaders and transforms that simplify the process of loading and preprocessing data for machine learning models.
- Model training: Lightning.ai provides a training loop that manages the training process, including the optimization of the model's parameters.
- Model evaluation: Lightning.ai provides metrics that can be used to evaluate the performance of a machine learning model.
- Model logging and checkpointing: Lightning.ai provides logging and checkpointing capabilities that can be used to track the progress of a training run and save the model's state at different points in time.

The relevant code is in this link:

https://github.com/cihatkayack/Fashion-Project/blob/main/code/CNN_example_with_Lightning.ipynb