Object Recognition Using Convolutional Neural Network in Deep Learning Approach

Abstract:

To recognize the objects present in data set using Convolutional Neural networks (CNNs), a concept of deep learning algorithm. Python programming language is used for both downloading and recognizing the images. The Cifar-10 database is used to download and classify images into various models. CIFAR-10 dataset consists of 60000 32x32 colour images in 10 classes, with 6000 images per class. There are 45000 training images, 10000 test images and 5000 validation samples. A training data with 36 images in random is visualized – The entire dataset is being decomposed into 3 data models – Training, Test and Validation datasets. This Decomposed model dataset is compiled and trained. The history for accuracy and history for loss are plotted using matplotlib function. The model with the best accuracy is loaded for prediction. The classification accuracy is evaluated for the test set. The predictions are being visualized.

Introduction:

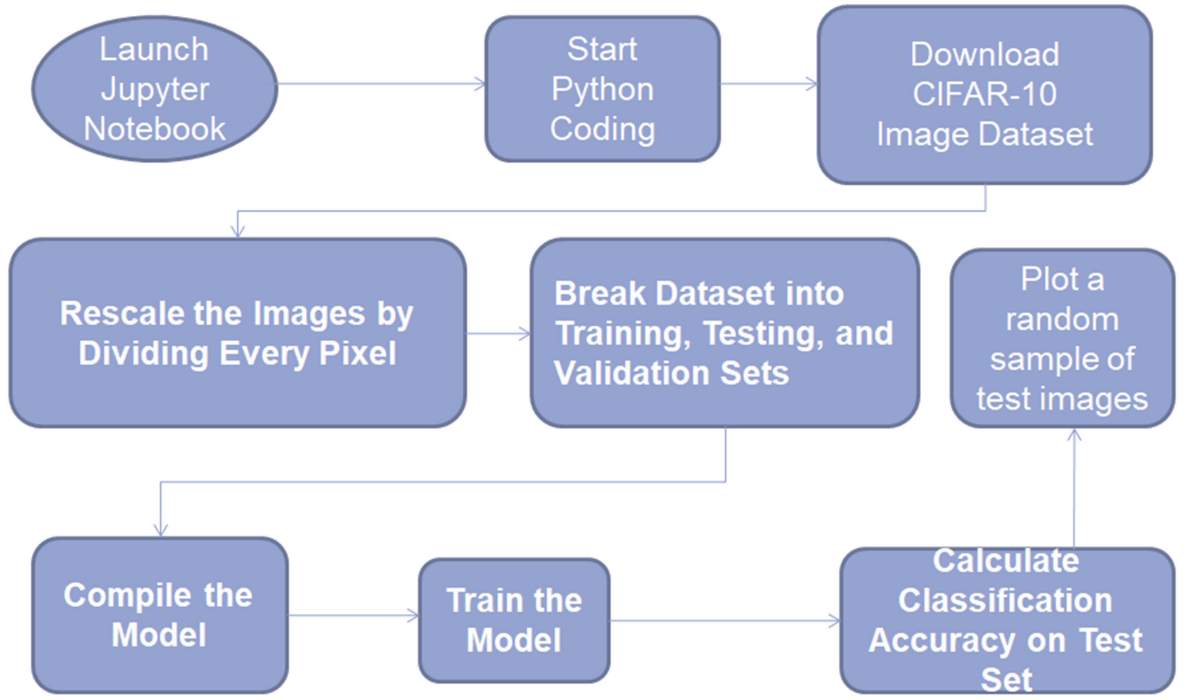
- Recognition of objects is one of the challenges in the field of Artificial Intelligence.
- Many systems have been developed to recognize and classify images.
- In the recent years huge strides have been made in making these systems more accurate.
- Convolutional neural networks (CNNs) have been widely used in visual recognition from 2012 due to its high capability in correctly classifying images.
- Object detection becomes an attractive topic in visual recognition area in the last decade.

Project Overview:

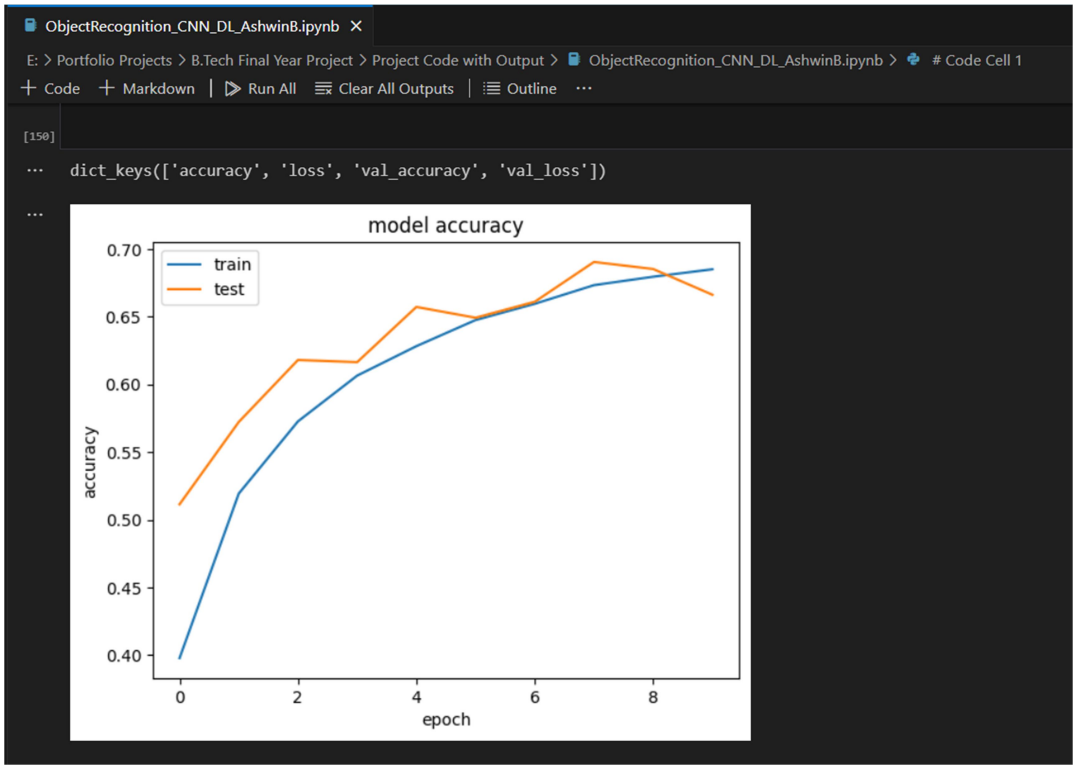
- In this project we have solved an image recognition problem, where our goal is to tell which class the input image belongs to.

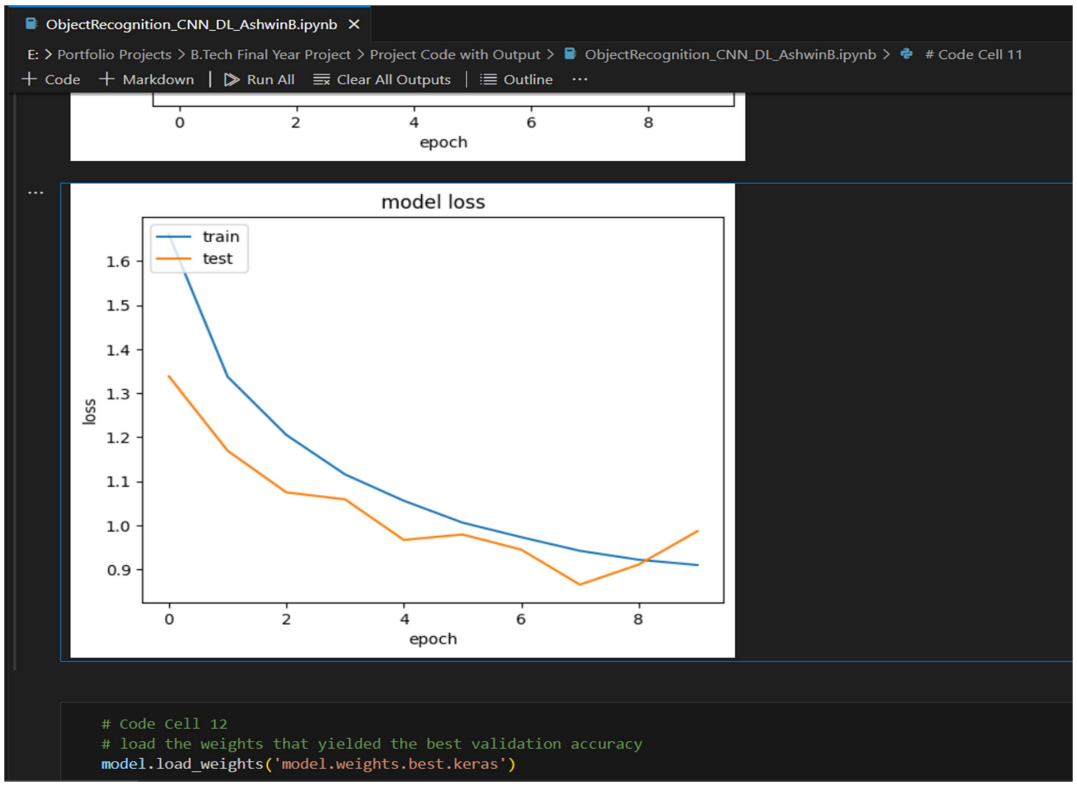
- The way we are going to achieve it is by training an artificial neural network on 60,000 images of airplane, automobile, bird, cat, deer, dog, frog, horse, ship and truck and make the NN(Neural Network) learn to predict which class the image belongs to, next time it sees an image having a cat or dog in it.
- With the latest figures image recognition techniques, we not only get the picture information faster than before, we can apply it to scientific experiments, traffic identification, security, medical equipment, face recognition and other fields.

System Architecture



Project Snips:





Project Output: