Project #5:
Machine Learning

Systems Programming

Department of Computer Science and Engineering

Sogang University

Due: June 5 (Wed), 11:59PM (KST)

Goal

1 Goal

The goal of this project is to improve your understanding machine learning and need for cloud services.

1. Write all code in Python3.
2. Work with Colaboratory using Hardware accelerator.
3. Use Keras for machine learning library.
4. Get more than 75% accuracy for CIFAR-10 dataset classifications.

CIFAR-10

The CIFAR-10 dataset consists of 60000 32x32 colour images in 10 classes, with 6000 images per class. There are 50000 training images and 10000 test images.

Here are the classes in the dataset, as well as 10 random images from each:
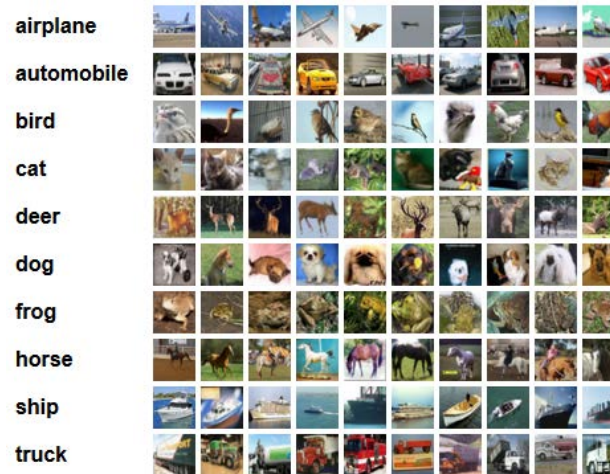
The classes are completely mutually exclusive. There is no overlap between automobiles and trucks. "Automobile" includes sedans, SUVs, things of that sort. "Truck" includes only big trucks. Neither includes pickup trucks.

3 Requirements

It's easy to find a way to get more than 75% accuracy for CIFAR-10 dataset classifications. (Just read https://keras.io/examples/cifar10_cnn/)

So, it's important to get high accuracy on this project, but it's also important to understand and explain how well you understand machine learning.

Therefore, please understand the method you used and describe in detail it as much as possible in your document.

Submission

1 Things

(1) Jupyter notebook file with outputs
- Do not clear outputs. You must have outputs.
- You can download @ File 〉 Download .ipynb

(2) A document file
- This document file should describe how you implemented your program.
- You write how you stacked the layers in your model.
- You attach a figure of confusion matrix.
- If there are other ways to improve accuracy, describe that in detail in your document.
- A sample document will be posted on cyber campus.

2 Instructions

- Make a directory named "sp20161234_proj5". The numeric part should be **your student ID**.
- Put all the files in the directory, and compress the directory itself using tar or zip.
- Change a Jupyter notebook file named "20161234.ipynb". The numeric part should be **your student ID**.
- When you make a tar file, do NOT use the z option (which makes a gz compressed file.)

Example:

sp20161234_proj5/

      document.docx

      20161234.ipynb

The file for submission

sp20161234_proj5.tar or sp20161234_proj5.zip

Upload this file on the cyber campus.

Late Submission

Late submissions are accepted for five days after the deadline. 10% of the points are deducted for each day. Submissions are not accepted after five days.