DSCI 552 Assignment 5

The aim of this assignment is to help you familiarize yourself with Keras and the Landmarks image dataset that you will use for your final project.

1. Install Keras

Keras is now part of Google's TensorFlow. The top-level installation page for TensorFlow is here:

https://www.tensorflow.org/install.

As the installation page points out, you can run TensorFlow on Google Colab. But, it is good to have alternatives and to be able to run on your own machine.

The installation instruction uses Miniconda, which is an installer that supports the creation of separate installation environments. This helps prevent Python package conflicts.

If you have an Nvidia GPU on your machine, then you should follow the GPU setup instructions and install the Nvidia GPU drive, CUDA and cuDDN. This will speed up running Keras.

2. Fashion MNIST Neural Network

Follow the instructions in Chapter 10 of Aurelien (Hands-on Machine Learning) to create a four-layer neural network (1 Flatten Layer and 3 Dense Layers) and train it on the Fashion MNIST dataset.

What to turn in:

- The **`CPU Times`** and **`Wall Times`** returned by fit() from the training process
- Generate loss and accuracy versus epoch plots (see Figure 10-11)
- The accuracy, precision and recall on the test test
- The precision and recall values by **`class_id`** on the test test. There are 10 classes.

3. Fashion MNIST Convolutional Neural Network

Repeat part problem 2, but this time create a convolution neural network using the Fashion MNIST network in Chapter 14 of Aurelien.