ENEL525 Project: Lesson 3 Exercise for Submission

For Lesson 3, you only need to submit Exercise #2 that exists in part 2 of the lesson (on slide #39). Instructions and some other notes are provided to you below to complete this submission. The exercise itself is also mentioned on the second page of this document for convenience.

Hand in (Midnight Dec. 08) via D2L Dropbox (5% of the final project grade): A PDF file that has screenshots of the following:

1. Your entire code running without errors. Warnings are fine as long as the code is running as expected (show the "Problems" tab in PyCharm or the correctly running cells in Jupyter)**.**
2. A screenshot of the data verification step (Images).
3. A screenshot of the model summary with dense layers added.
4. A screenshot of the training epochs with accuracy/loss.
5. A screenshot of the accuracy/loss plot.

Notes:

- If you face any Cuda/Cudnn errors while running the code, go to python packages, uninstall tensorflow and then install tensorflow-cpu.
- For this exercise, you might use tensorflow-cpu or tensorflow-gpu. However, if you decide to choose the GPU version, first make sure you have an available gpu on your local machine and then install the correct Cuda/Cudnn versions that are compatible with your device.
- Jupyter/Google Colab allows you to use python online by connecting to a remote instance of a "server" with limited CPU/GPU resources.
- These instances may time-out and give you "Server error message" if left inactive for long periods of time, you can:

1) Save the code in a text file or .py file.
2) Restart a new instance (https://jupyter.org/try).
3) Continue by copying the code to the new python3.pynb or run the python file from terminal.

- Alternatively, you can just work offline with your own computer with python (3.7.0+) and IDE like Pycharm 2021 (Lesson 1 videos explain how to do so in details).

Useful links:

- Pycharm: https://www.jetbrains.com/pycharm/
- Python: https://www.python.org/downloads/
- Jupyter lab to execute python in browser: https://jupyter.org/try
- Google Colab to execute python in browser: https://colab.research.google.com/?utm_source=scs-index
- Cuda/Cudnn compatibility: https://www.tensorflow.org/install/source_windows
- Cuda/Cudnn installation: https://developer.nvidia.com/cudnn

If you have any feedback to improve future lessons or questions regarding the content/exercises, please email: aliadib.arnab@ucalgary.ca

Exercise 2: Building a CNN Network using Tensorflow (From Lesson 3 - Part 2 (Slide #39)):

- Go through the CNN Tutorial:
  https://www.tensorflow.org/datasets/keras_example
- Implement the code to correctly classify images of the dataset.
- Submit a screenshot of all the required steps as mentioned on page 1 of this document.

This will aid in utilizing CNN for the image dataset of the final project.