Deep Learning
Assignment 7

Instructions:
1. Provide commented, indented code. Variables should have meaningful names.
2. Use Google Colab as the code editing/ execution environment.
3. Write questions in separate text blocks before the code blocks containing answers.
4. Read the questions carefully before answering. If a question asks to follow a particular approach or to use a specific data structure, then it must be followed.

Problem Statement:

- In this assignment, we will build a model with convolutional layer/layers.
- Dataset:
    - Link: https://drive.google.com/file/d/1wCBE5Yam0KAFNxvzYXlH0cGaycT_k8gQ/view?usp=sharing
    - We will be using a subset of Facial Expression Recognition dataset. We will just have two classes, namely 'happy' and 'neutral'.
    - The images are of size 48×48. The images are given in two folders: 'train' and 'test'.
    - Train folder further contains two sub-folders, one for each class of images.
    - You may use these folder names 'happy' and 'neutral' as the class names.
    - The test folder contains a '.npy' file. It contains the test images. **Do not** shuffle the test dataset after loading as the indices of the test images need to be left unchanged for evaluation by us. You may load the test dataset as follows:
      ```
      import numpy as np
      data = np.load('test_data.npy')
      # This will be an array of size (200,48,48,1) with 200 test images.
      ```

- Build and train a model with Convolutional layer/layers to classify the images in the test dataset as either 'happy' or 'neutral'.
- Report the accuracy of the model on the training dataset.
- Run the model on the test dataset and output the results to a *.csv* file. The file should have two columns:
    - 1. 'Index', having the index of the image in the test dataset.
    - 2. 'Output', having the values 'happy' or 'neutral'.

Files to be submitted:

1. .ipynb file containing code named as 'YourName_YourRollNo_Assignment7.ipynb'
2. .csv file containing the output named as 'output.csv'.