Homework 3 (200 points)

Notes:

- Put information about yourself in the second line of each file like this: First name_Last name
- Comment your codes thoroughly.
- Upload files to Canvas (see below).

You should be able to complete this homework if you followed class lectures.

Problem: Attached you will find a dataset containing images of flowers. Your task is to classify these flowers using dense deep neural network. The following sub-tasks must be performed:

1. **Data:**
    1. Data must be split in train/test and validation set.
    2. You must use Tensorflow dataset api to setup a data feed pipeline as demonstrated in the lectures, you must include:
        a) Code that will count number of classes.
        b) Number of images in each class.
        c) Image resized to 101x101xNo_Of_channels.
        d) Automatic data label extraction based on sub-directory name.
        e) Display one batch of image/label using the dataset api.

2. **Model:** A deep dense model (not CNN), exact architecture is your choice.
3. **Train/validation:** This must also include:
    1. Early stopping.
    2. Tensorboard.
4. **Model Evaluation:** Evaluate model on test dataset. You must include the following:
    1. Confusion matrix.
    2. Accuracy metrics.
5. **Model predictions:** Make predictions using your trained model on a sample of test images. Display image, true and predicted labels.

Uploads:

1. Code file named **HW_3.py** (This is python script file. You can export your jupyter notebook to make this file).
2. Your jupyter notebook. This is completed notebook which has been run and includes all the above results. (**HW_3.ipynb**)
3. Export your HW3_ipynb after running to a PDF file and also upload this.

Note: If you do not submit a code file (HW_3.py and HW_3.ipynb) but only a PDF file, you will get a zero score as your submission cannot be run by the grader.