Flower Classification Using Transfer Learning

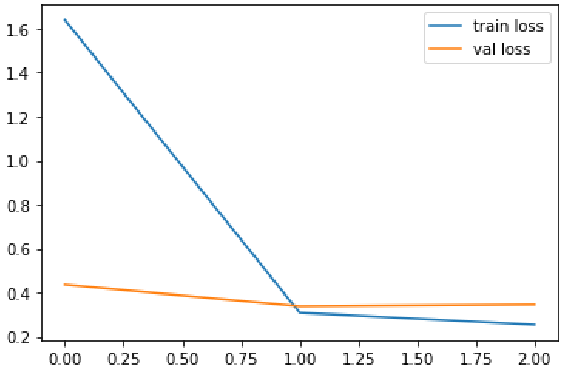
In transfer learning, a machine exploits the knowledge gained from a previous task to improve generalization about another. Transfer learning is useful when you have insufficient data for a new domain you want handled by a neural network, and there is a big pre-existing data pool that can be transferred to your problem.

We have flower data, but it is not sufficient for complete neural network building. Therefore, I am using transfer learning to tackle this business problem.

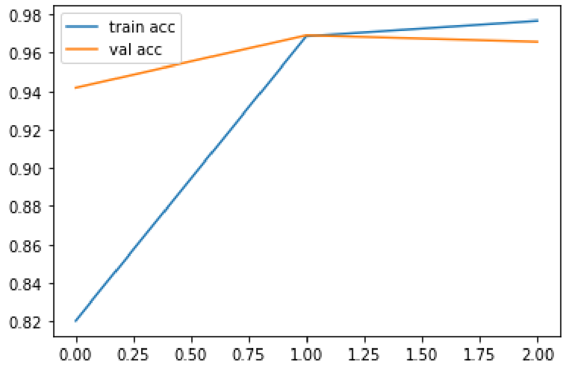
MetaData: -

Data Name	**-**	flower (folder).
Format	**-**	Images (.jpg).
Output Classes	**-**	daisy, sunflower, tulip.
Size of Data	**-**	Train 60 Mb & Test 16 Mb.
Size of Train	**-**	990 Images.
Size of Test	**-**	300 Images.
Source of Data	**-**	Kaggle.com.

I got this flower data from Kaggle does certain modifications for use in our business problem. I try many transfer learning models such as Mobile net, Mobile net_v2, Xception, InceptionResNetV2, VGG16, VGG19, but Mobile net is giving the best result as compare to other, and it is taking much lesser computation time and power. Therefore I choose this as my final model. Our data don't have many output classes, so it is not good idea to use a very heavy neural network. The below graph shows the accuracy and losses of the Mobile net Neural network for our data.



Training and Testing Losses



Training and Testing Accuracy

The jupyter file with name **Flower Classification.ipynb** consists final model. There are certain changes in code such as filepath are have to be modified in order to run code without any error (it is because the working directory changed). Notebook also contains comment where file path have to update.

Conclusion - The model is giving good training and testing accuracy on a dataset with less than 1000 images for training and does not show any kind of high overfitting.

References -

- https://www.tensorflow.org/tutorials/images/transfer_learning
- https://www.kaggle.com/dansbecker/transfer-learning
- https://keras.io/api/applications
- https://towardsdatascience.com/a-comprehensive-hands-on-guide-to-transfer-learning-with-real-world-applications-in-deep-learning-212bf3b2f27a
- https://www.youtube.com/watch?v=84J1fMkIQWE&t=56s (YouTube AI Engineering Channel)
- https://www.researchgate.net/publication/325803364_A_Study_on_CNN_Transfer_Learning_for_Image_Classification

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