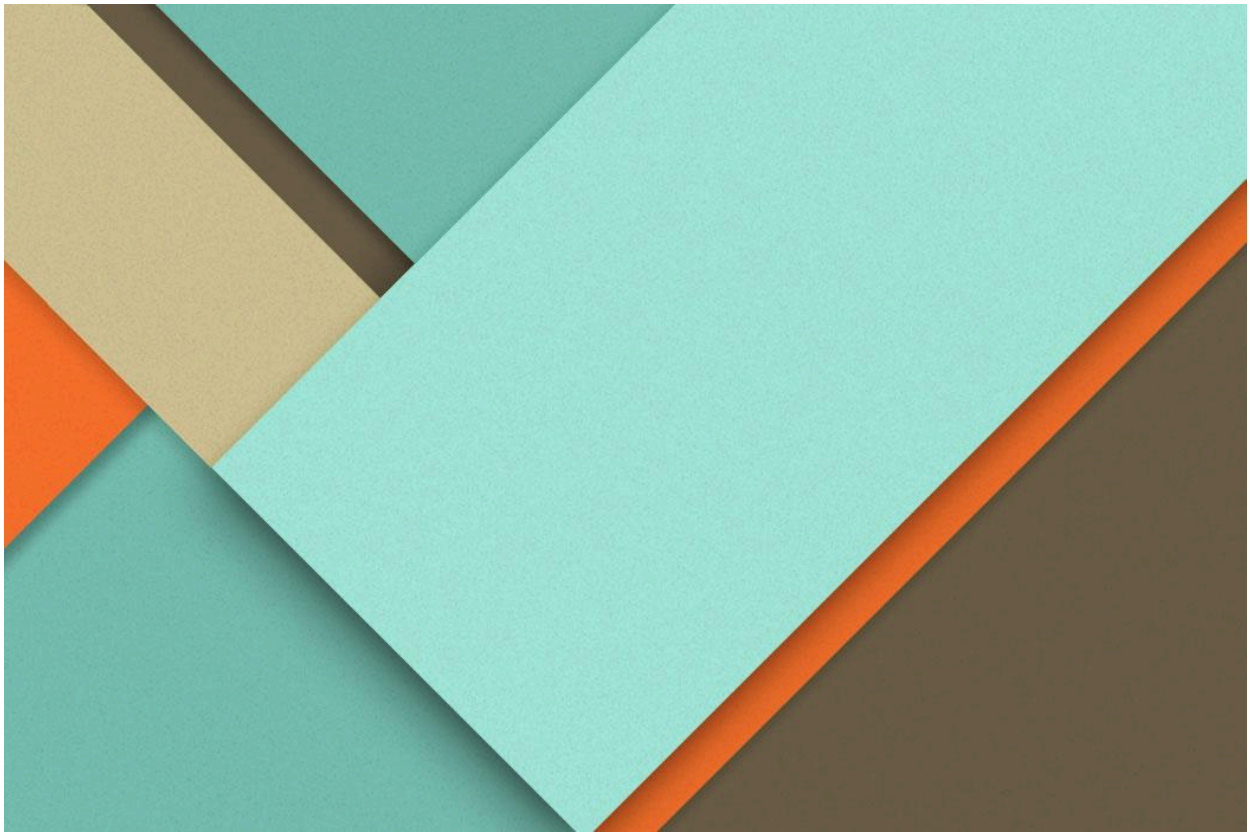


CIFAR-100

—

Divya Hegde

SML CIFAR-100 CNN - DH

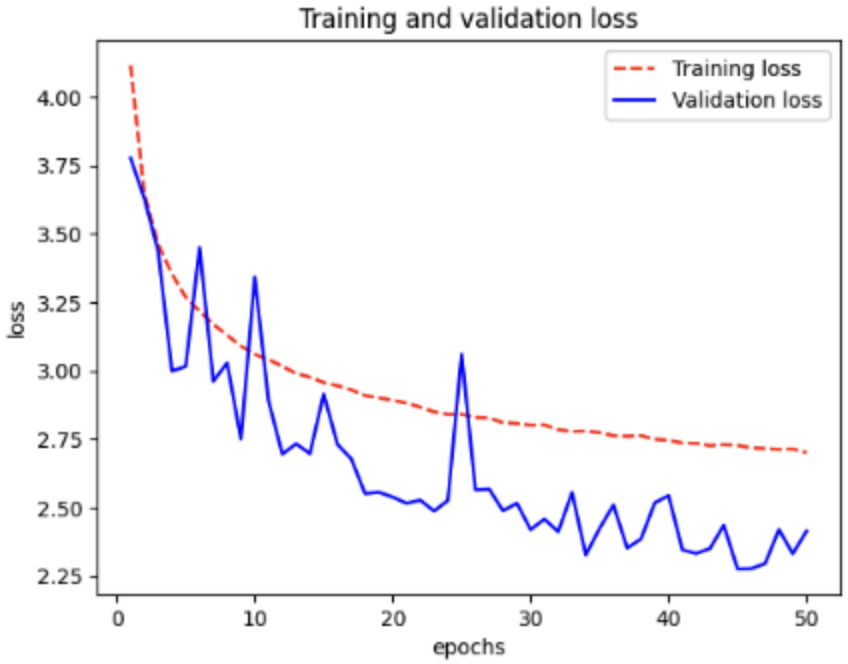
https://colab.research.google.com/gist/divyahegde-07/8357c0ae4423a0cb89b34b187804eafa/final-code.ipynb#scrollTo=ig3gHFph8rDp

CIFAR-100 using CNN

This approach involves building and training a custom CNN model from scratch and using transfer learning with pre-trained ResNet50 model. 5 convolution blocks, flateening layer, and Dense Layers. 1st CNN layer has 64 filters, 2nd has 128, 3rd has 256, 4th and 5th having 512 layers. The first dense layer uses relu activation function and he output dense layer uses softmax activation function. The max pooling layers reduce dimensionality and computational cost while learning abstract features.

Analysis for simple custom CNN

```
500/500 - 4s - loss: 4.6052 - accuracy: 0.0099 - 4s/epoch - 7ms/step
test accuracy:  0.009899999946355820
```



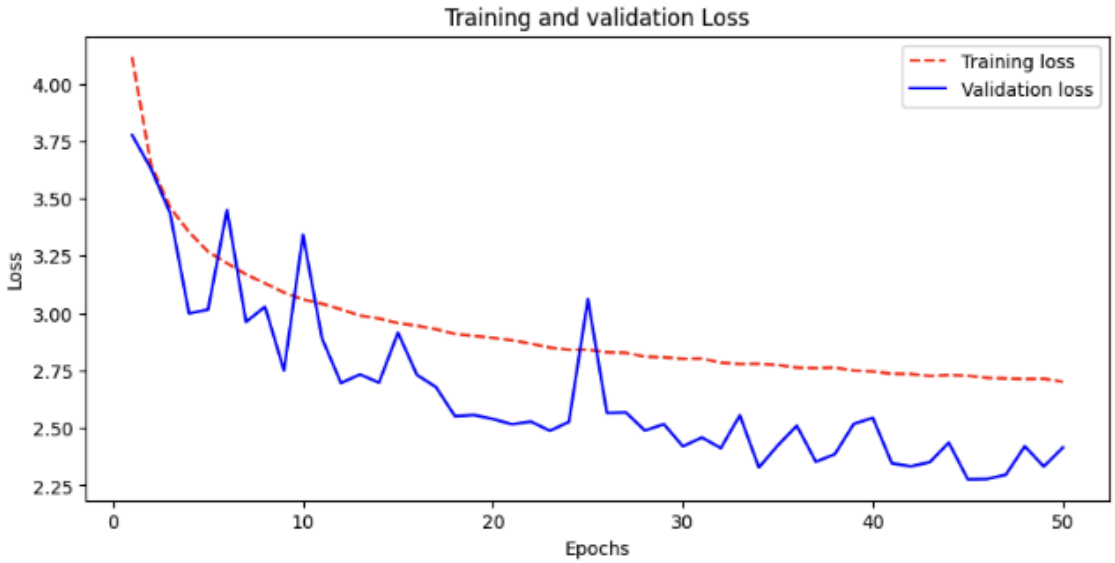

```
<Figure size 640x480 with 0 Axes>
```

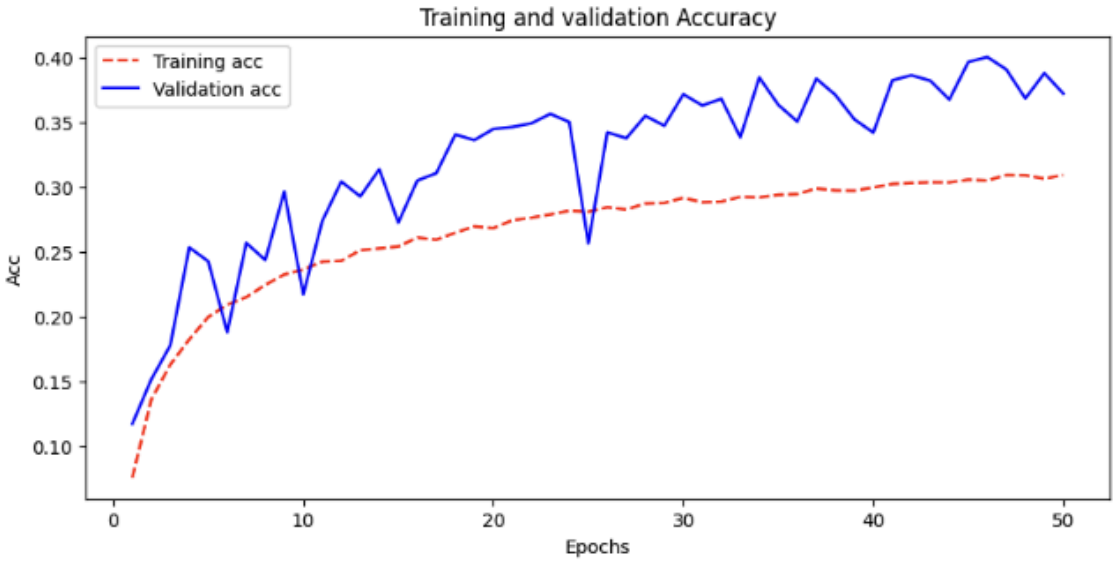
1. The training accuracy is increasing overtime indicating progression in training accuracy over time. The validation accuracy is also increasing but it shows variability

and is less than training accuracy. It represents how well the model is genearlizing to unseen data.

2. For Training vs validation loss graph, validation loss decreases but shows variability. A lower validation loss suggests better generailization.
3. In conclusion the model performs better on training data than on validation data, suggesting overfitting. Both accuracy and loss on validation data seem to flatten out as epochs increase which suggests that further training may not yield significant improvements in model's performance on new data.
4. If we adjust the larning rate, batch size, or architecture might help genarilize better

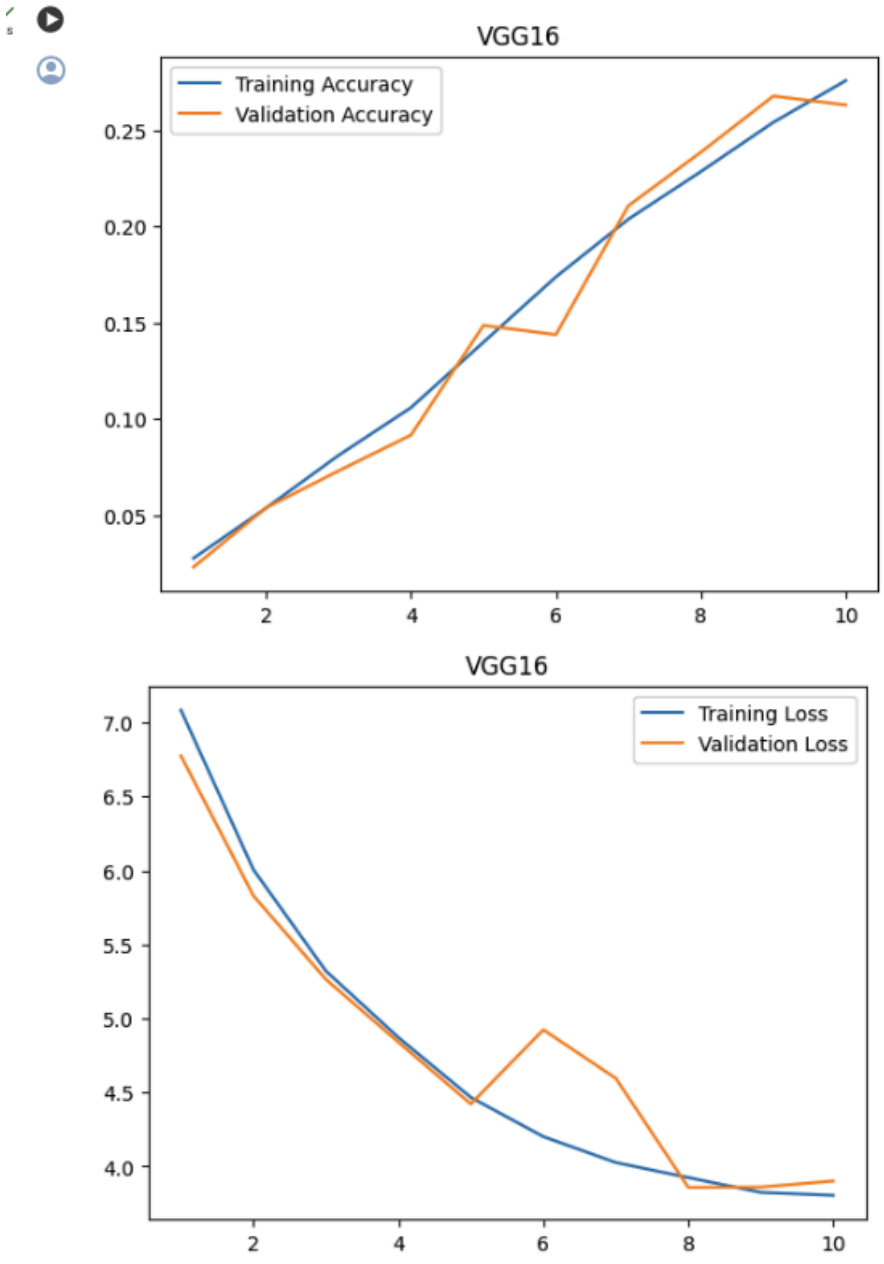
Analysis for CNN with ResNet transfer learning





1. There is a considerable gap between training and validation data in accuracy graph suggesting overfit.
2. Training loss decreases relatively smoothly. But shows a spike at epoch 25. The accuracy is also dipping at 25 epoch suggesting the model could have dealt with difficult or mislabeled data

Analysis for VGG16 from scratch



1. Both the training and validation accuracy are increasing over the epochs, which indicates that the model is learning and improving its performance on both the training set and unseen validation set.
2. The validation accuracy is higher than the training accuracy initially but then converges. This trend is because of less number of epochs that is trained with.
3. The lack of smoothness in validation loss could be due to variation in validation set.