Attached notebooks are implementation of ResNet proposed by Microsoft Research in https://arxiv.org/abs/1512.03385 .

Summary of Contents:

1) **Cifar10.ipynb:** A 34 layer Deep Convolutional Neural Network based on Resnet Architecture.
2) **Cifar_110_layers.ipynb:** 110 layer implementation of Deep Convolutional Neural Network based on Resnet Architecture.

Dataset Used:

Link of dataset: https://www.cs.toronto.edu/~kriz/cifar.html

The deep residual network proposed in the paper was tested on various datasets like MS-COCO,Cifar-10 etc. Keeping in view the time and computational requirements I have used **Cifar-10** dataset composed of 60,000 images (50,000 training & 10,000 testing) divided into 10 classes.

The models are trained on GoogleColab and using the same hyperparameters and optimizer as given in the paper.

Data augmentation methods like horizontal flipping has been used as discussed in the paper.

Results:

Using Cifar 34 layer architecture, highest validation accuracy achieved is 85.86%.

Using Cifar 110 layer architecture, highest validation accuracy achieved is 70.02%.

Limitations

With 34 layer architecture due to computational limitation, I was able to run only 105 epochs compared to 64,000 used in the paper.

With 110 layer architecture with 1.7M parameters from scratch,i t was not possible to train more than 65 epochs due to session time out and limited GPU.