“ If you want to run the code file first you have to download the images have have to put the respective path of content\_image\_path and style\_image\_path “

An explanation of the code what each cell is doing is written at the top of each in the colab notebook

In the same folder, I have uploaded some content images and style images,

For feature calculation of the image, I used a pre-trained VGG19 network because it requires much GPU and data images to train the model for feature extraction.

All the things are also mentioned in the code file.

For Style transfer, took a generated\_image, initialised it with content image, ran 3000 epochs for this tensor and updated this generated image,

The loss function for this model is content\_loss and style\_loss,

Content\_loss is the MSE loss between original\_image and generated\_image features till ith epoch

and style loss is calculated by style\_image and generated\_image features by calculating Gram\_matrix of style\_image and generated\_image feature matrix

Style\_loss is MSE loss of gram\_matrix of style\_image and generated\_image

Gram\_marix=W\*(W transpose)

content\_loss=  **torch.mean((gen\_feature - orig\_feature)\*\*2)**

style\_loss= **torch.mean((Gram(gen\_feature)- Gram(orig\_feature))\*\*2)**

Total loss =alpha \* content\_loss + beta\* Style\_loss

The value of alpha and beta is hyper Parameter tried many different values of alpha and beta

Found alpha= 1 and beta=0.01 are giving good results, still can try different values of alpha and beta

Plotted content\_loss and Style\_loss and total\_loss for each 200 epochs

Content\_loss should increase with epoch because we initialised the generated image with content\_image

Style\_loss should decrease with the epoch we are transferring style to the generated image

Total\_loss also decreases with epoch