Columbia University
IEOR4742 – Deep Learning for OR & FE (Hirsa)
Assignment 5 – Due 11:40 am on Thursday April 30th, 2020

Problem 1 (Generative Adversarial Networks - GANS): Rewrite the sample code *example_GANs.jpynb* for the provided data (222 images) to train a `GAN`. You may use the snippets provided in *exampleReadingSavingImages.ipy* to read and save images.

(a) use all images with random shuffling for training the `GAN`. For random shuffling you may use the below sample code (also provided in *exampleReadingSavingImages.ipy*

```
def next_batch(data, batchSize):

    #Return a total of ‘batchSize‘ random samples

    idx = np.arange(0 , len(data))

    np.random.shuffle(idx)

    idx = idx[:batchSize]

    data_shuffle = array([data[i] for i in idx])

    return data_shuffle
```

(b) use 3 different autoencoders to create three different set of (222) images

(c) train the `GAN` using these 888 images)

(d) compare and assess your results in part (a) & (c)

Problem 2 (Deep Convolutional GAN): In building an architecture for a deep convolutional GAN, assume 5 convolutional layer for the generator using `tf.layers.conv2d_transpose` and 5 covolutional layer for the discriminator using tf.layers.conv2d. Specify filters, kenrnel_size, and strides in your architecture if your image sizes are 1024×1024.