

Practice Programming Assignment 1

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1. Train a DC GAN (with an architecture of your choice) on the given data with the usual GAN loss. Plot the loss curves for the Generator and Discriminator losses.
2. Plot a 10 by 10 grid of images for generated images.
3. Vary the number of times the generator and discriminator is trained and document the outcome.
4. Write a code for computing the FID and compute FID by sampling 1000 data-points from both the true and the generated data distributions.
5. Implement two types of latent space traversals and plot the outcomes. Latent space traversal refers to randomly sampling two input vectors and generating images via (Linear or non-linear) interpolations.
6. Implement conditional generation by randomly choosing 20 subclasses in the data.
7. Implement a classifier on the given data by fine-tuning a Resnet (32 or 50) pre-trained on imagenet. Compute and report the classification accuracy and the F1 score.
8. Take the 20-class subset of the data (as taken in problem (6)), train a resnet-based classifier, and report the metrics.
9. Use the c-GAN trained in problem (6) to generate 100 more images per each of the 20-classes. Use these augmented data to retrain the classifier in the previous question. Compare the results with the previous classifier without augmentation.

General Instructions:

1. We use only one dataset for this assignment.
2. The dataset can be found here - [data](#)
3. The dataset consists of 5400 Animal Images Across 90 Classes images.

4. You need to resize all images to 128x128 pixels before implementing.
5. Use Google collab with Jupiter notebook for all the computing.
6. Use Pytorch for building neural networks. You are supposed to directly use the off-the-shelf functions for the models asked.