

Assignment :3

*Student Name: Sufiyan Adhikari**Roll No: 173190009*

1.1 Answers

1. Training dataset has 5000 samples. Training Dataloader has batch size of 64 with total of 79 batches.
2. Validation dataset has 1000 samples but the dataset is not used for anything as the training set itself was short enough to try few epochs for trying out hyperparameters.
3. Fig. 1.1 shows Discriminator Loss and Generator Loss. We try training the model with two different ways,
 - (a) Train Discriminator for a few batches (say 5) before training Generator for a higher number of batches as in code discussed inclass (say 50 batches). As training the generator does not require original samples, these 50 batches of samples can be done on the fly without iterating over the dataset. Hence in each epoch, the Discriminator is trained on 79 batches of original samples and equal number of samples of generated samples.

Generator is trained every 5th batch of dataloader for 50 batches of generator samples, i.e., a total of 550 batches of 64 samples each. This gives better convergence of generator loss but the output images are not good enough visually.
 - (b) Train Discriminator for 2 batches followed by training Generator for 5 batches of generated images. This type of training leads to generator loss increasing where as the discriminator loss reduces. This being said, this paradigm of training leads to better looking images than the first one where both loss decrease and converge.

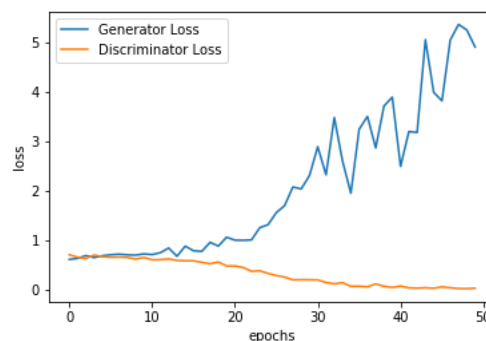


Figure 1.1: Generator and Discriminator Loss vs Number of Epochs

4. The Fig. 1.2 shows original images of cars for Cifar10 dataset
5. Fig 1.3 shows the generated images of cars by our DCGAN

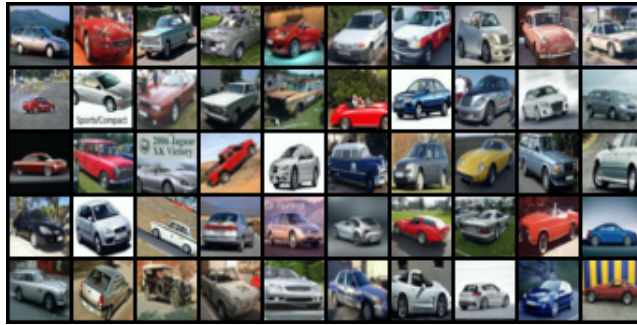


Figure 1.2: Cars in CIFAR10

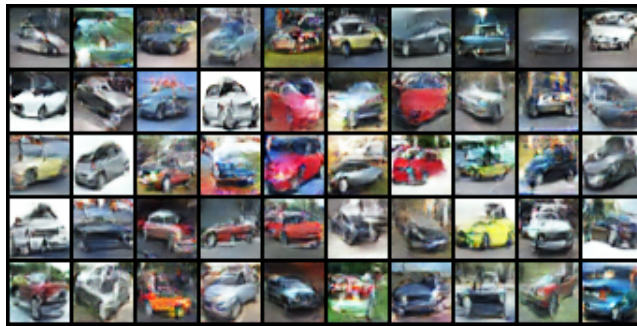


Figure 1.3: Car images generated by out DCGAN

6. What we can say about these generated images is that they are far from perfect. If we train the generator for ar more iterations than the discriminator, the loss converges but the images are ever less visually compelling. The Fig 1.4 show the generated images when we train generator far more than discriminator, giving us better loss but bad images.

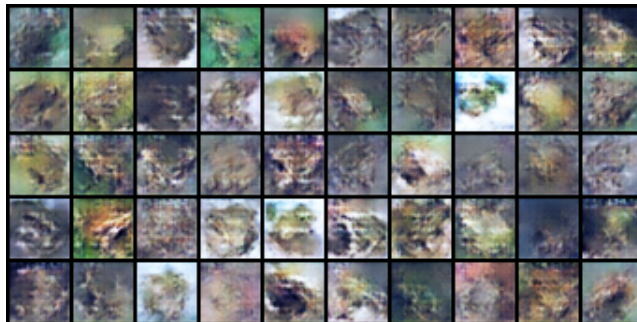


Figure 1.4: Frog images generated by the DCGAN with better loss convergence