

## Homework 3: GANs / Diffusion Models

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**Deliverable:** This PDF write-up by **Sunday May 1st, 23:59pm**. Your PDF should be generated by simply replacing the placeholder images of this LaTeX document with the appropriate solution images that will be generated automatically when solving each question. The solution images are automatically generated and saved using the accompanying IPython notebook. Download your results from Google Colab and replace the images in the figures/ folder with your result images. Write your name and ID in the necessary parts below, confirming the Honor Pledge. Then, you will run the .tex file to generate your PDF file. Your PDF is to be submitted into Blackboard along with your notebook, please follow the instructions given in the GitHub page. This PDF already contains a few solution images. These images will allow you to check your own solution to ensure correctness. Note that in some parts of this report, you will need to put the final loss/accuracy values you obtained.

**Honor Pledge:** “I affirm that I have not given or received any unauthorized help on this assignment, and that this work is my own.”

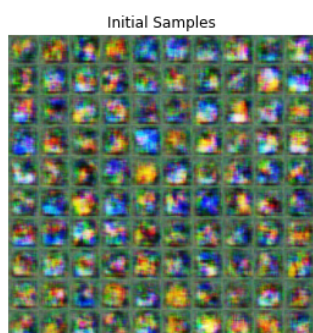
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**Note:** *This assignment is adapted from UC Berkeley [CS294-158-SP20](#)*

### **Question 1: DCGAN [25 pts]**

Final Discriminator Real Loss: **0.00881346594542265**, Discriminator Fake Loss: **0.00223397184163332**, Generator Loss: **1.0533943176269531**



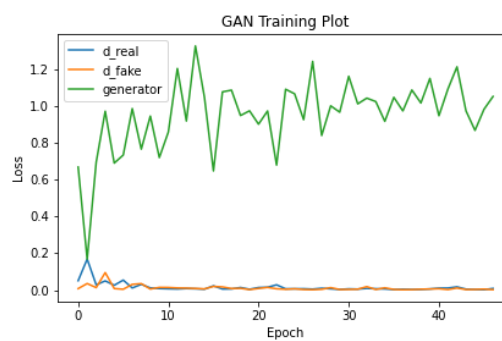
(a) Initial Samples



(b) Intermediate Samples



(c) Final Samples

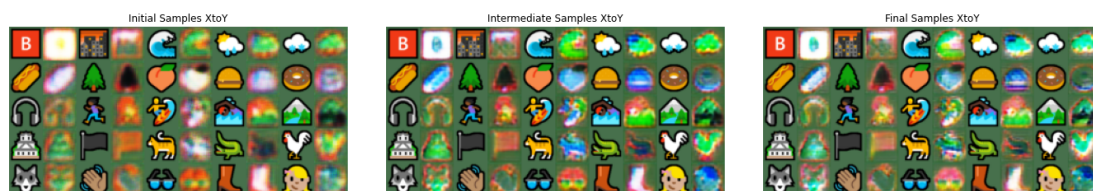


(d) Training Curve

Figure 1: Results for DCGAN

**Question 2: CycleGAN [25 pts]**

Final Discriminator Real Loss: 0.02484861947596073, Discriminator Fake Loss: 0.42815327644348145,  
 Generator Loss: 3.263123407959938



(a) Initial Samples XtoY

(b) Intermediate Samples XtoY

(c) Intermediate Samples XtoY



(d) Initial Samples YtoX

(e) Intermediate Samples YtoX

(f) Intermediate Samples YtoX



(g) Training Curve

Figure 2: Results for CycleGAN

**Question 3: Diffusion Models****(a) Part (a) DPM [25 pts]**

Final Full -ELBO: **-16.2080**, Recon Loss: **1.2686**, KL Loss: **-17.4766**

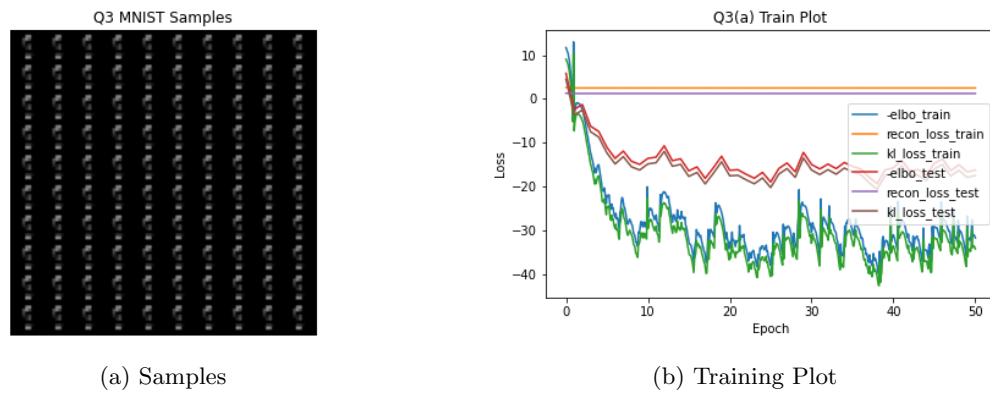


Figure 3: Results for Part a

**(b) Part (b) DDGM [25 pts]**

Final Loss: **FILL**

Placeholder

Placeholder

(a) Samples

(b) Training Plot

Figure 4: Results for Part b