

## Homework 3: GAN Models

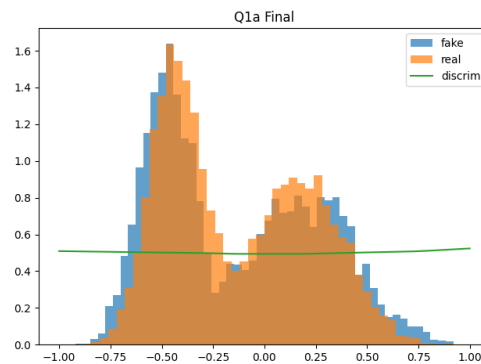
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**Deliverable:** This PDF write-up by **Tuesday March 6th, 23:59pm**. Your PDF should be generated by simply replacing the placeholder images of this LaTeX document with the appropriate solution images that will be generated automatically when solving each question. The solution images are automatically generated and saved using the accompanying IPython notebook. Your PDF is to be submitted into Gradescope. This PDF already contains a few solution images. These images will allow you to check your own solution to ensure correctness.

### Question 1: 1D Data

#### (a) [10pt] Minimax GAN Objective

Placeholder



(a) Samples at epoch 1

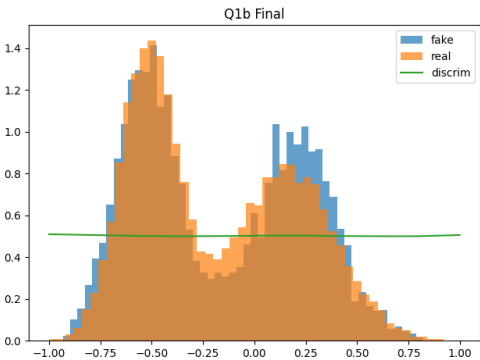
(b) Final samples

Placeholder

(c) GAN loss curve

(b) [10pt] Nonsaturating Objective

Placeholder



(a) Samples at epoch 1

(b) Final samples

Placeholder

(c) GAN loss curve

**Question 2: WGAN-GP on CIFAR-10 [35pt]**

Final inception score: **TODO**

Final Fréchet inception distance: **TODO**

Placeholder

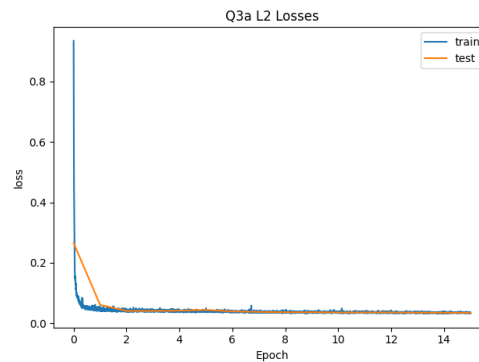
(a) Samples

Placeholder

(b) Training curve

**Question 3: Quantization with GANS [40 pt]****Part a: Vanilla VQGAN [25 pt]** Final l2 validation reconstruction loss: **TODO**

Placeholder



(a) Discriminator losses

(b) L2 losses

Placeholder

(c) LPIPS losses



(d) Reconstructions

**Part b: ViT-VQGAN [15 pt]** Final l2 validation reconstruction loss: **TODO**

Placeholder

Placeholder

(a) Discriminator losses

(b) L2 losses

Placeholder

(c) LPIPS losses

Placeholder

(d) Reconstructions

**Bonus Questions (Optional)**

1. [20pt] CycleGAN

Placeholder

(a) MNIST: original images, translations, and reconstructions

Placeholder

(b) Colored MNIST: original images, translations, and reconstructions