GANs

Assignment Questions

PW SKILLS

GANs

1. What does GAN stand for, and what is its main purpose?
2. Explain the concept of the "discriminator" in GANs.
3. How does a GAN work?
4. What is the generator's role in a GAN?
5. What is the loss function used in the training of GANs?
6. What is the difference between a WGAN and a traditional GAN?
7. How does the training of the generator differ from that of the discriminator?
8. What is a DCGAN, and how is it different from a traditional GAN?
9. Explain the concept of "controllable generation" in the context of GANs
10. What is the primary goal of training a GAN?
11. What are the limitations of GANs?
12. What are StyleGANs, and what makes them unique?
13. What is the role of noise in a GAN?
14. How does the loss function in a WGAN improve training stability?
15. Describe the architecture of a typical GAN.
16. What challenges do GANs face during training, and how can they be addressed?
17. How does DCGAN help improve image generation in GANs?
18. What are the key differences between a traditional GAN and a StyleGAN?
19. How does the discriminator decide whether an image is real or fake in a GAN?
20. What is the main advantage of using GANs in image generation?
21. How can GANs be used in real-world applications?
22. What is Mode Collapse in GANs, and how can it be prevented?

Practical

1. Implement a simple GAN architecture to generate random images (like noise or basic shapes) using TensorFlow/Keras.
2. Implement the discriminator for a GAN with an image input of shape (28, 28).
3. Train the generator to produce simple digits (using noise as input) and plot the generated images.
4. Implement WGAN by modifying the loss function in the GAN.
5. Use a trained generator to generate a batch of fake images and display them.
6. Create a StyleGAN-inspired architecture that outputs high-resolution images.
7. Implement the Wasserstein loss function for GAN training.
8. Write a function to modify the discriminator to include a dropout layer with a rate of 0.4 and print the configurations.
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