Started on	Tuesday, 11 March 2025, 3:51 PM
State	Finished
Completed on	Tuesday, 11 March 2025, 3:58 PM
Time taken	6 mins 23 secs
Marks	14.00/15.00
Grade	**93.33** out of 100.00

Question 1

Complete

Mark 1.00 out of 1.00

What loss function is used to train the U-Net model?

- a. Huber Loss
- b. Mean Absolute Error (MAE)
- c. Cross-Entropy Loss
- d. Mean Squared Error (MSE)

Question 2

Complete

Mark 1.00 out of 1.00

What is the main advantage of a Variational Autoencoder (VAE) over a standard Autoencoder?

- a. VAE introduces stochasticity, allowing it to generate diverse outputs
- b. VAE does not use any encoder-decoder structure
- c. VAE removes noise in a stepwise manner like Stable Diffusion
- d. VAE can only reconstruct input images, while a standard Autoencoder generates new images

Question 3

Complete

Mark 1.00 out of 1.00

What does the `generate_image` function do in the implementation?

- a. It trains the U-Net model on new data
- b. It classifies an image into categories
- c. It removes artifacts from a given image
- d. It generates an image by reversing the diffusion process from pure noise

Question 4

Complete

Mark 0.00 out of 1.00

Why is `alpha_t` used in the reverse diffusion process?

- a. To control the step size of the optimizer
- b. To update the weights of the U-Net model
- c. To randomly generate new noise samples
- d. To scale back the original image information that was corrupted

Question 5

Complete

Mark 1.00 out of 1.00

In the training step, what does the U-Net model predict?

- a. The class label of the image
- b. The segmentation map of the image
- c. The noise added at a given time step
- d. The denoised image

Question 6

Complete

Mark 1.00 out of 1.00

What is a key difference between Variational Autoencoders (VAEs) and Stable Diffusion in terms of randomness?

- a. Stable Diffusion does not use a probabilistic approach, unlike VAE
- b. VAEs add noise at every step like Stable Diffusion
- c. VAEs use a fixed latent space, while Stable Diffusion introduces randomness at every denoising step
- d. VAEs use diffusion models internally for training

Question 7

Complete

Mark 1.00 out of 1.00

How does a traditional Autoencoder differ from Stable Diffusion in terms of learning representation?

- a. Autoencoders learn a compressed latent representation, while Stable Diffusion learns a noise removal process
- b. Autoencoders use a denoising process to gradually add noise
- c. Autoencoders work with random noise, while Stable Diffusion works only with clean images
- d. Autoencoders generate images from pure noise, while Stable Diffusion reconstructs missing parts

Question 8

Complete

Mark 1.00 out of 1.00

What is the purpose of the forward diffusion process in Stable Diffusion?

a. To fine-tune the neural network
b. To upscale the image resolution
c. To progressively add noise to an image
d. To remove noise from an image

Question 9

Complete

Mark 1.00 out of 1.00

What is the function of the `add_noise` method in the code?

a. To denoise the images using the trained model
b. To add Gaussian noise to an image at a specific time step
c. To transform images into high-resolution samples
d. To predict the missing pixels in an image

Question 10

Complete

Mark 1.00 out of 1.00

How does Stable Diffusion differ from VAE in terms of image generation?

a. Stable Diffusion does not use deep learning, while VAE does
b. VAE does not encode image information, while Stable Diffusion does
c. Stable Diffusion starts with a latent noise vector and removes noise iteratively, while VAE directly decodes a latent space vector
d. VAE uses a stepwise noise removal process, while Stable Diffusion directly generates an image

Question 11

Complete

Mark 1.00 out of 1.00

Why do we use a U-Net architecture in the reverse diffusion process?

a. It applies transformations to images to enhance sharpness
b. It reduces computational cost by compressing images
c. It efficiently predicts and removes noise from images
d. It generates new image samples directly from noise

Question 12

Complete

Mark 1.00 out of 1.00

Why does Stable Diffusion perform better at high-resolution image generation compared to VAE?

- a. It works in a latent space and gradually denoises the image, preserving fine details
- b. It does not require training like VAE
- c. It does not use any form of encoder-decoder architecture
- d. It has a simpler architecture than VAE

Question 13

Complete

Mark 1.00 out of 1.00

In the forward diffusion process, what is the role of the `betas` variable?

- a. It defines the learning rate of the optimizer
- b. It sets the activation function threshold
- c. It controls the noise variance added at each step
- d. It determines the noise reduction factor during denoising

Question 14

Complete

Mark 1.00 out of 1.00

Why do we use the `torch.no_grad()` decorator in the `generate_image` function?

- a. To ensure that the output image is always different
- b. To allow the network to learn during inference
- c. To prevent unnecessary gradient computations and reduce memory usage
- d. To improve model accuracy

Question 15

Complete

Mark 1.00 out of 1.00

In the denoising step, why do we add a small amount of random noise back in each step?

- a. To reduce the training time
- b. To speed up the diffusion process
- c. To make the denoising process deterministic
- d. To introduce diversity and prevent mode collapse