

AE-VAE-StableDiffusion-Quiz

Started on	Tuesday, 11 March 2025, 3:52 PM
State	Finished
Completed on	Tuesday, 11 March 2025, 3:59 PM
Time taken	7 mins 6 secs
Marks	14.00/15.00
Grade	93.33 out of 100.00

Question 1

Complete

Mark 1.00 out of 1.00

Flag question

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

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

Question 2

Complete

Mark 1.00 out of 1.00

Flag question

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

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

Question 3

Complete

Mark 1.00 out of 1.00

Flag question

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

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

Question 4

Complete

Mark 1.00 out of 1.00

Flag question

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

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

Question 5

Complete

Mark 1.00 out of 1.00

Flag question

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

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

Question 6

Complete

Mark 1.00 out of 1.00

Flag question

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

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

Question 7

Complete

Mark 1.00 out of 1.00

Flag question

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

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

Question 8

Complete

Mark 1.00 out of 1.00

Flag question

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

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

Question 9

Complete

Mark 1.00 out of 1.00

Flag question

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 removes noise in a stepwise manner like Stable Diffusion
- ☐ c. VAE can only reconstruct input images, while a standard Autoencoder generates new images
- ☐ d. VAE does not use any encoder-decoder structure

Question 10

Complete

Mark 1.00 out of 1.00

Flag question

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

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

Question 11

Complete

Mark 1.00 out of 1.00

Flag question

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 has a simpler architecture than VAE
- ☐ c. It does not require training like VAE
- ☐ d. It does not use any form of encoder-decoder architecture

Question 12

Complete

Mark 1.00 out of 1.00

Flag question

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

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

Question 13

Complete

Mark 1.00 out of 1.00

Flag question

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

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

Question 14

Complete

Mark 1.00 out of 1.00

Flag question

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

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

Question 15

Complete

Mark 0.00 out of 1.00

Flag question

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

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