

Name: _____

Score: _____ / _____

Worksheet 11- generative models

Part 1: VAE-type models

Each multiple choice question in this part is worth one bonus point. The free text exercise (4) is worth two bonus points.

Given the smallest possible VAE with input dimension 10, latent space dimension 3, and dense layers only: what is the number of trainable parameters ignoring bias?

- ☐ A. $10 \cdot 6 + 3 \cdot 10$
- ☐ B. $2 \cdot 10 + 2 \cdot 3$
- ☐ C. $10 \cdot 3 \cdot 2$
- ☐ D. $10 \cdot 6 \cdot 2$

Answer Point Value: 0.0 points

Answer Key: A

Given the smallest possible cVAE with input dimension 10, latent space dimension 3, conditions of dimension 7, and dense layers only: what is the number of trainable parameters ignoring bias?

- ☐ A. $10 \cdot 6 + 10 \cdot 10$
- ☐ B. $2 \cdot 17 + 10 \cdot 7$
- ☐ C. $17 \cdot 6 + 10 \cdot 10$

☐ D. $10 \cdot 6 + 3 \cdot 10$

Answer Point Value: 0.0 points

Answer Key: C

How does one generate new data with a trained non-conditional VAE?

- ☐ A. **Getting output of the decoder while giving input to the encoder.**
- ☐ B. **Getting output of the decoder while giving random input to the decoder.**
- ☐ C. **Getting output of the encoder while giving input to the encoder.**
- ☐ D. **Getting output of the encoder while giving random input to the encoder.**

Answer Point Value: 0.0 points

Answer Key: B

Briefly explain the reparametrization trick used in VAEs.

Answer Point Value: 0.0 points

Model Short Answer: -----

Part 2: GAN-type models

Each question in this part is worth one bonus point.

What is a necessary criterium for a successfully trained GAN?

- ☐ A. **The discriminator outputs on average a vector containing values close to 0.**

- ☐ B. The discriminator outputs on average a vector containing values close to $\frac{1}{2}$.
- ☐ C. The discriminator outputs on average a vector containing values close to 1.
- ☐ D. None of the above.

Answer Point Value: 0.0 points

Answer Key: B

What inputs are needed to train the generator part of a non-conditional GAN?

- ☐ A. A random source and labelled real data.
- ☐ B. A random source and real data.
- ☐ C. A random source and labels.
- ☐ D. A random source.

Answer Point Value: 0.0 points

Answer Key: D

What inputs are needed to train the discriminator part of a non-conditional GAN?

- ☐ A. Fake data, real data, gradients with respect to the weights in the generator.
- ☐ B. Fake data and real data.
- ☐ C. Fake data.
- ☐ D. None of the above.

Answer Point Value: 0.0 points

Answer Key: B

Please state the names of all the students you worked with on this assignment:

Answer Point Value: 0.0 points

Model Short Answer: -----