Lecture 3 - Exercise sheet
Master in Deep Learning - Generative Models

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Problem 1.

What is the mathematical intuition behind the loss function of the generator $\max_D V(D, G)$?

Problem 2.

Consider the vanilla GAN and the WGAN. In terms of the mathematical intuition of the loss function (see previous the problem), what is the difference between the two?

Problem 3.

Could you explain, in your own words, the mode collapse problem?

Problem 4.

Could you explain, in your own words, the vanishing gradient problem?

Problem 5.

Why do we add the gradient penalty term to the discriminator loss of WGANs?

Problem 6.

What are the differences between the discriminators of GANs and WGANs?

Problem 7.

How would you modify the generator and discriminator to create a Conditional GAN? You should be able to generate images of a specific class from a noise vector and the given class.

Problem 8.

Does a Conditional GAN help with mode collapse? Why?