**DC GAN**

The following is a document on my learnings of DCGAN so far for future reference. It includes project description and theoretical knowledge on the topic.

**Project source**: <https://www.coursera.org/programs/north-south-university-on-coursera-vlsiv?productId=diZmsX1dEeqydg6lB5w_Cw&productType=course&showMiniModal=true>

**Project Brief**

The project teaches how to build and train a Deep Convolutional GAN (DCGAN) with Keras to generate images of fashionable clothes using MNIST dataset. It makes use of the Keras Sequential API with Tensorflow 2 as the backend.

“In our GAN setup, we want to be able to sample from a complex, high-dimensional training distribution of the Fashion MNIST images. However, there is no direct way to sample from this distribution. The solution is to sample from a simpler distribution, such as **Gaussian noise**.

We want the model to use the power of neural networks to learn a transformation from the simple distribution directly to the training distribution that we care about. **The GAN consists of two adversarial players: a discriminator and a generator.** We’re going to train the two players jointly in a minimax game theoretic formulation. “

**Steps:**

1. Project Overview and Import Libraries
2. Load and Preprocess the Data
3. Create Batches of Training Data
4. Build the Generator Network for DCGAN
5. Build the Discriminator Network for DCGAN
6. Compile the Deep Convolutional Generative Adversarial Network (DCGAN)
7. Define the Training Procedure
8. Train DCGAN
9. Generate Synthetic Images with DCGAN

Refer to <https://medium.com/@jonathan_hui/gan-dcgan-deep-convolutional-generative-adversarial-networks-df855c438f#:~:text=DCGAN%20is%20one%20of%20the,network%20design%20for%20the%20generator>. For an insight on what DCGAN is.

**Key words:** transposed convolution technique, LeakyReLu, Keras, Sigmoid, Batch Normalization, tqdm