Exercise 5

In this exercise we implement a wgan and dcgan model on fashion-mnist data-set.

Details about the training :

We follow the papers of dcgan & Improved Training of Wasserstein GANs. the architecture of the model taken for the DCgan paper with adaption to 28*28 pictures of fashion-mnist.
for the wgan implementation we add gradient penalty to the loss (to make the critic stand the Lipschitz 1 condition)
we trained the models for 50 ephocs with 1*10-4 learning rate (2 *10-4 for the generator in the dcgan) with batch size of 64 and latent dimension of 100 ,and 5 cycles of crtic training per 1 generator training ,according to wgan paper.

We notice that the time for training Wgan-GP extremely large regard to time to train dcgan (we assume the reason is we do 5 iteration for batch on critic regard to 1 on the discriminator in the DCgan).

Using tensorboard to follow the progression of the training process We noticed that already in low number of iterations(about 10-20) the generated image start get shape that similar to images from the data-set but for accurate image much more iteration is needed (the logs for tensor aboard are appended and can be shown also in the Colab version of this project and also during run).

Following are examples for the generated images from the two models with compatible image with the label from the data-set.

T-shirt-top

dc-gan 

wgan- 

real- 

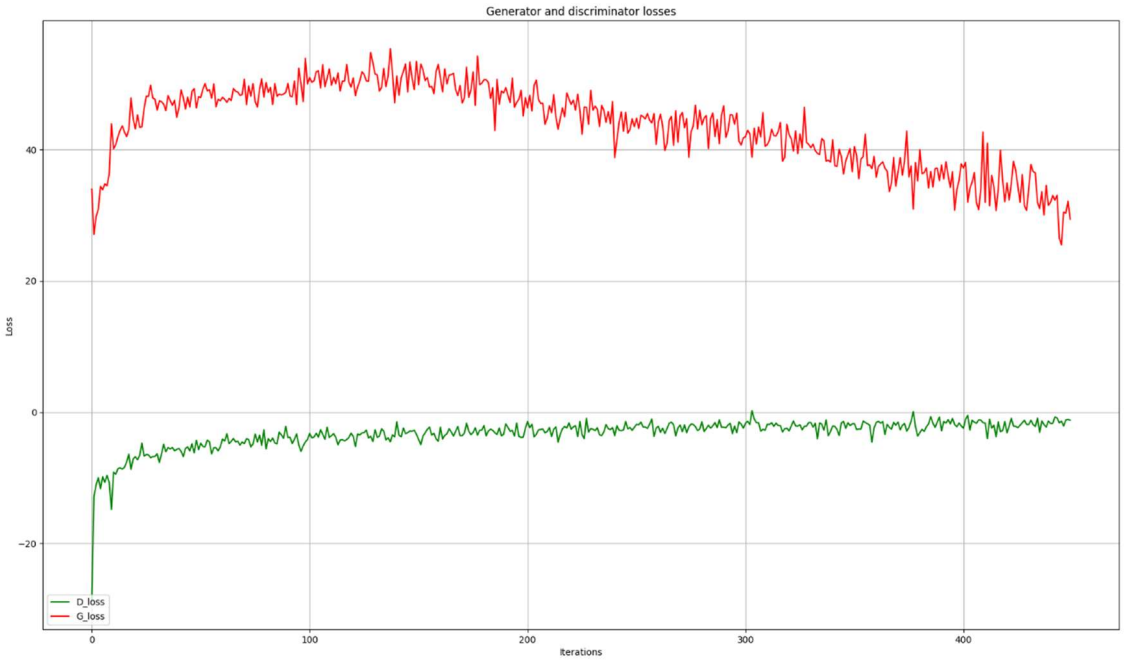
Ankle boot

wgan- 

dcgan- 

real- 

The loss function for the Wgan :



The loss function for the DCgan: