

GAN

Distrminator model:

```
Discriminator(  
  (Discriminator): Sequential(  
    (0): Linear(in_features=200, out_features=512, bias=True)  
    (1): LeakyReLU(negative_slope=0.2)  
    (2): Linear(in_features=512, out_features=256, bias=True)  
    (3): LeakyReLU(negative_slope=0.2)  
    (4): Linear(in_features=256, out_features=256, bias=True)  
    (5): LeakyReLU(negative_slope=0.2)  
    (6): Linear(in_features=256, out_features=1, bias=True)  
    (7): Sigmoid()  
  )  
)
```

Generator model:

```
Generator(  
  (Generator): Sequential(  
    (0): Linear(in_features=16, out_features=1024, bias=True)  
    (1): ReLU()  
    (2): Linear(in_features=1024, out_features=512, bias=True)  
    (3): ReLU()  
    (4): Linear(in_features=512, out_features=256, bias=True)  
    (5): ReLU()  
    (6): Linear(in_features=256, out_features=200, bias=True)  
    (7): Tanh()  
  )  
)
```

Image

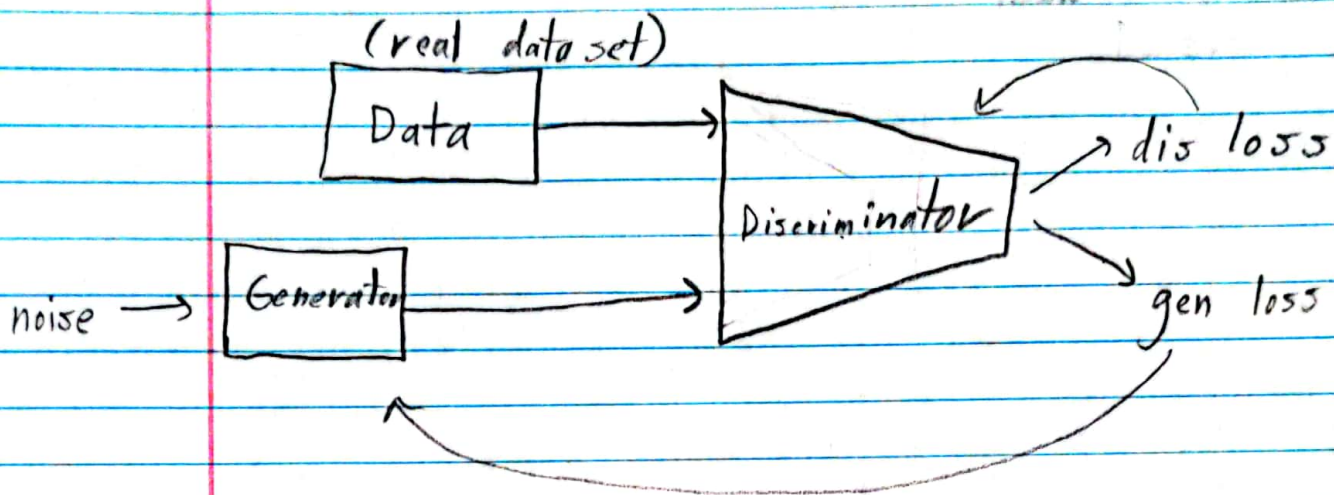


Loss

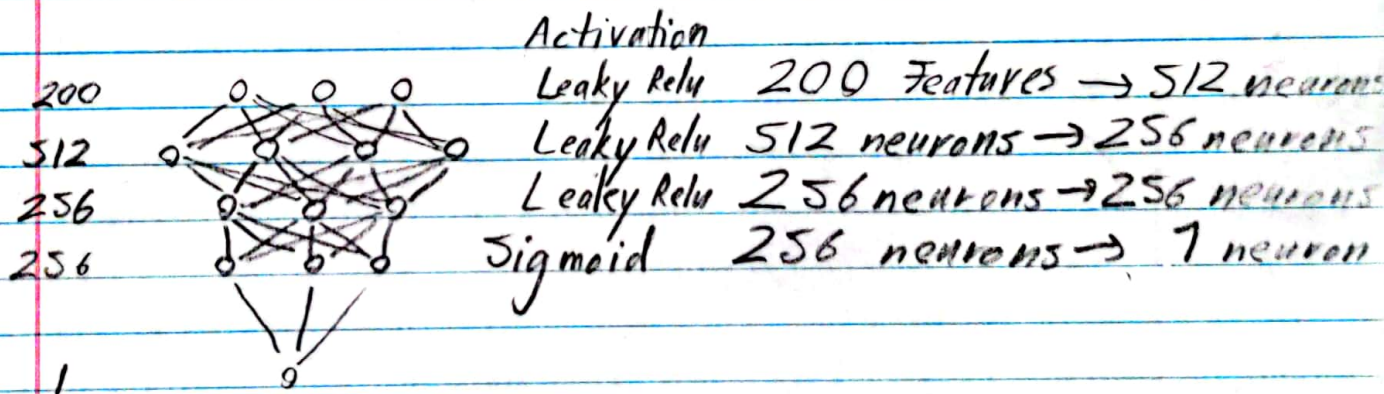
Epoch: [199/200], Batch: 89, Discriminator loss: 0.6902265548706055, Generator loss: 0.6802454590797424

GAN Report

Structure of GAN

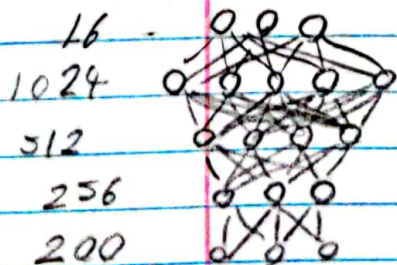


Discriminator Neural Network



Generator Neural Network

NN



Activation

Relu

Relu

Relu

Tanh

(latent dimension)

16 Features \rightarrow 1024 neurons

1024 neurons \rightarrow 512 neurons

512 neurons \rightarrow 256 neurons

256 neurons \rightarrow 200 output

GAN

Hyper parameters
Number of epochs 200

Generator

Optimizer : Adam

Learning Rate : 0.0005

Beta 1: 0.5

Beta 2: 0.999

Loss Function:

Binary Cross Entropy

Latent Dimension: 6

Discriminator

Optimizer : Adam

Learning rate : 0.0005

Beta 1: 0.5

Beta 2: 0.999

Loss Function:

Binary Cross Entropy

VAE Model

VAE model:

```
VAE(  
  (fc1): Linear(in_features=200, out_features=512, bias=True)  
  (fc2): Linear(in_features=512, out_features=256, bias=True)  
  (fc31): Linear(in_features=256, out_features=16, bias=True)  
  (fc32): Linear(in_features=256, out_features=16, bias=True)  
  (fc4): Linear(in_features=16, out_features=256, bias=True)  
  (fc5): Linear(in_features=256, out_features=512, bias=True)  
  (fc6): Linear(in_features=512, out_features=200, bias=True)  
)
```

Image

Reconstruction



Synthesized

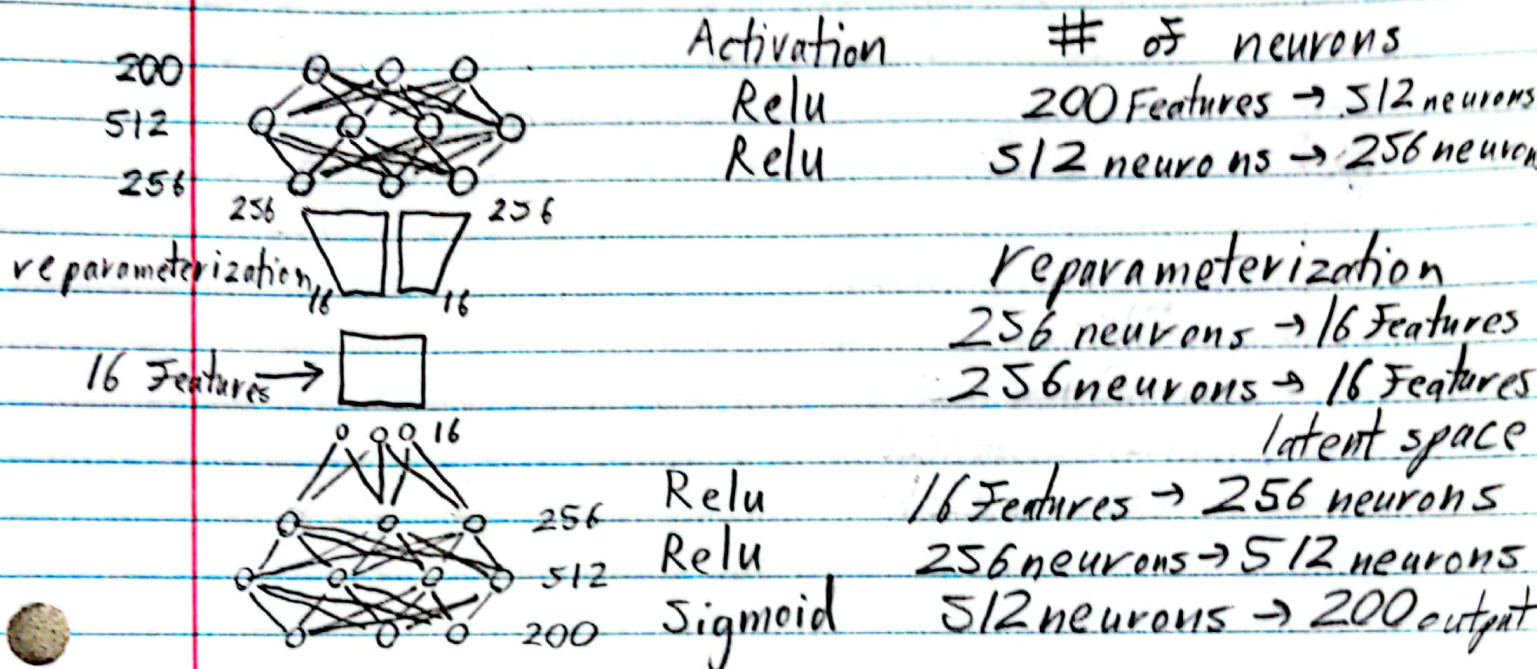


Loss

Epoch: [34/35], Batch: 89, loss: -3409.102294921875

VAE Report

Structure of VAE



Hyperparameters

learning rate: 0.001

number of epochs: 35

size of latent space: 16

Batch size: 16

Optimizer: Adam

Loss:

Kullback-Leibler divergence + cross entropy loss