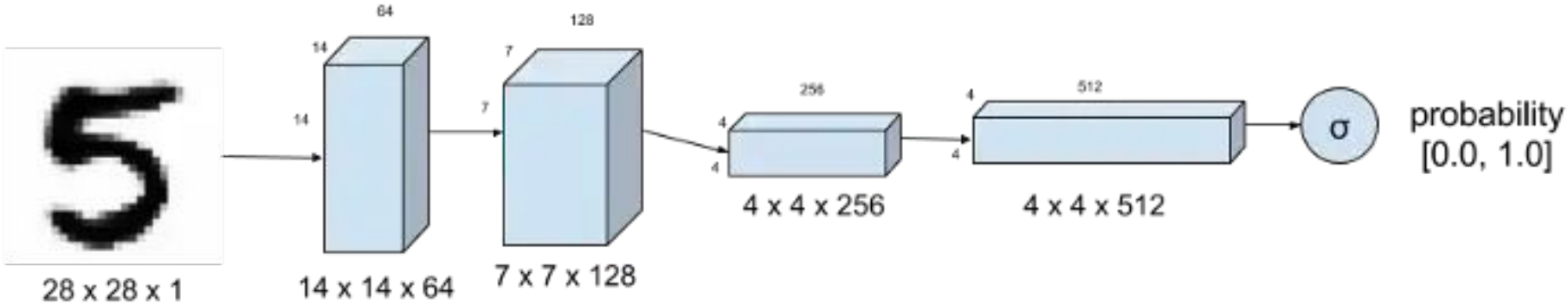
Generative Adversarial Networks (GANs)

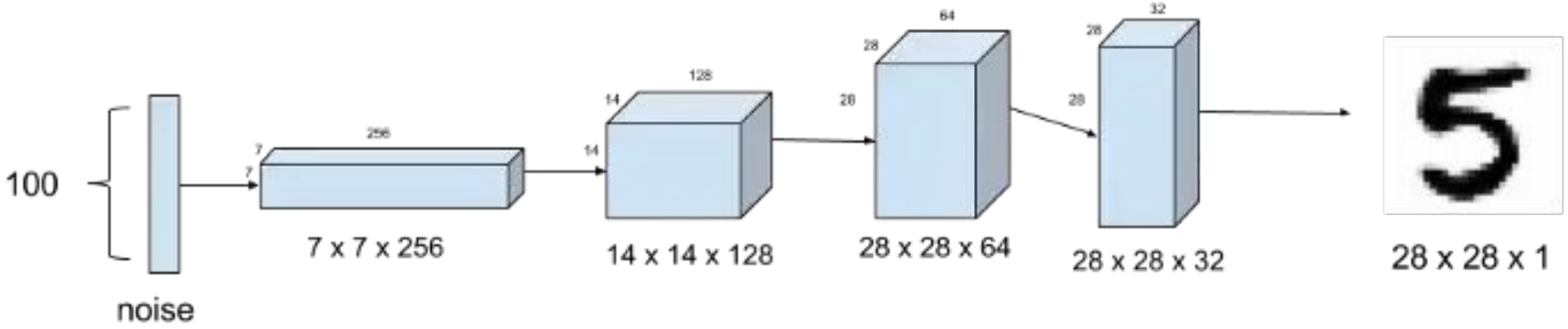
GANs

- 2 main components:
  - Discriminator
  - Generator

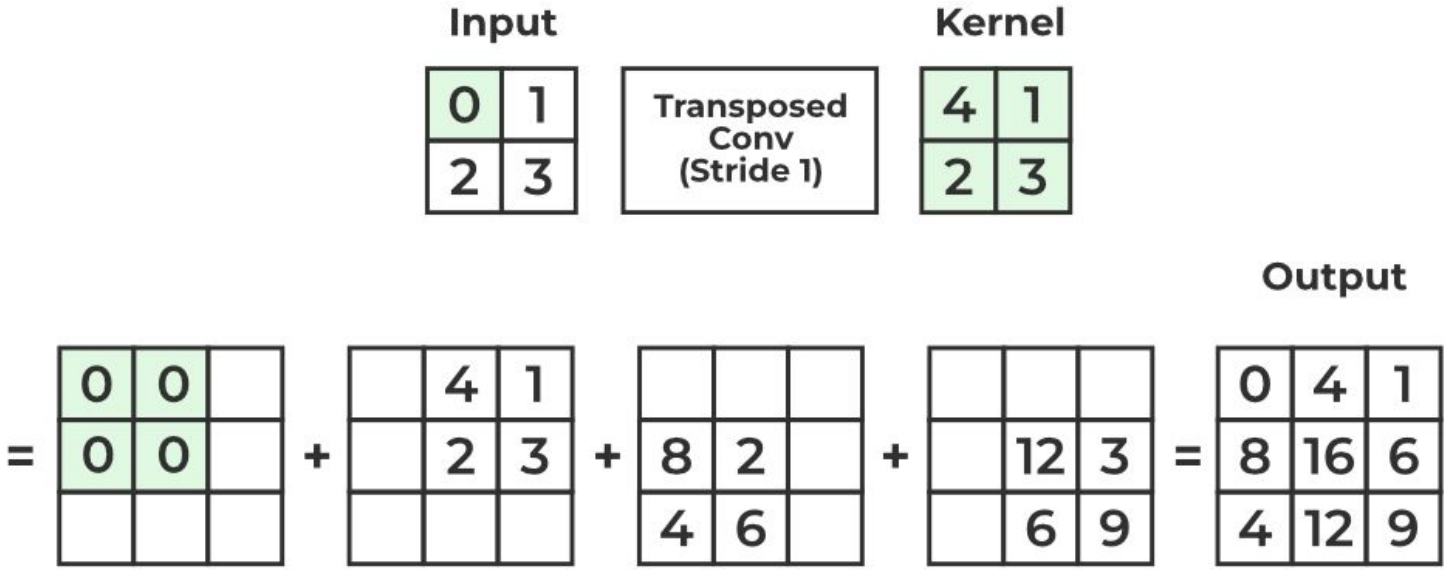
Discriminator



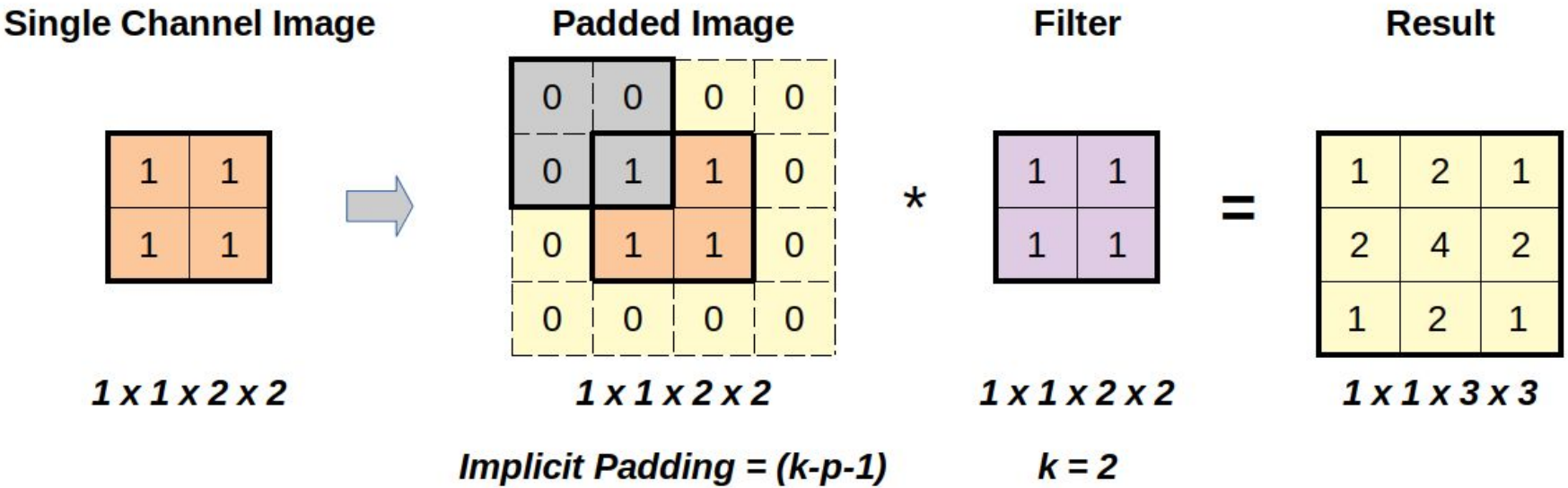
Generator


100
noise
7
7
256
7 x 7 x 256
14
14
128
14 x 14 x 128
28
28
64
28 x 28 x 64
28
28
32
28 x 28 x 32
28 x 28 x 1

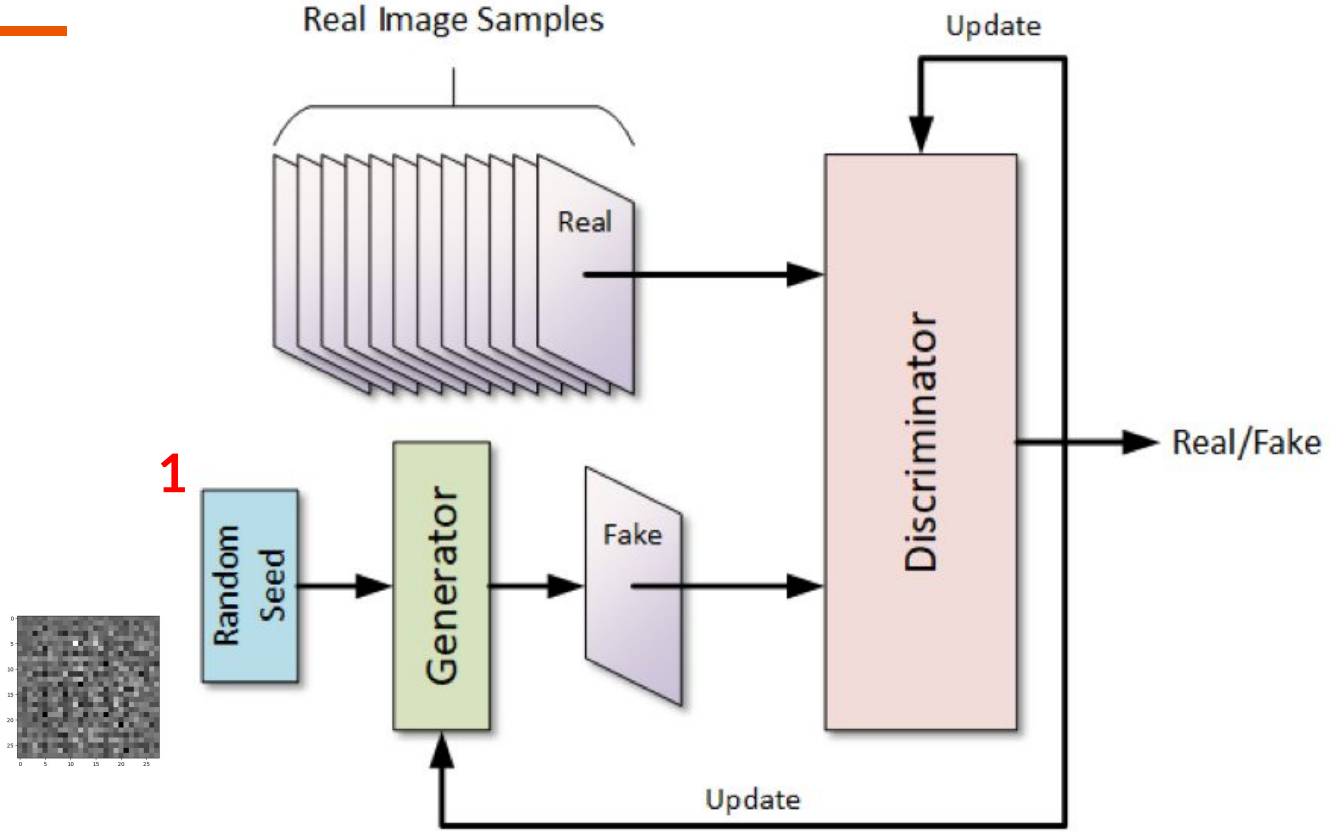
Conv and ConvTranspose



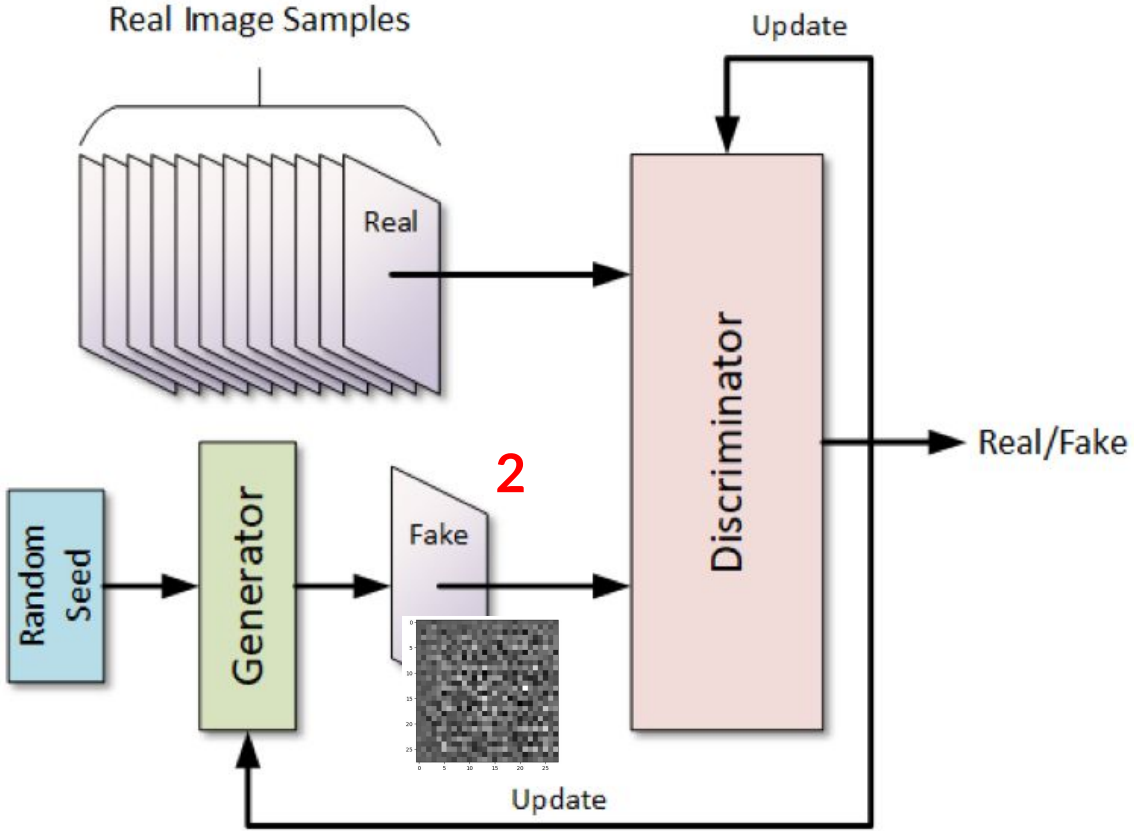
Conv and ConvTranspose



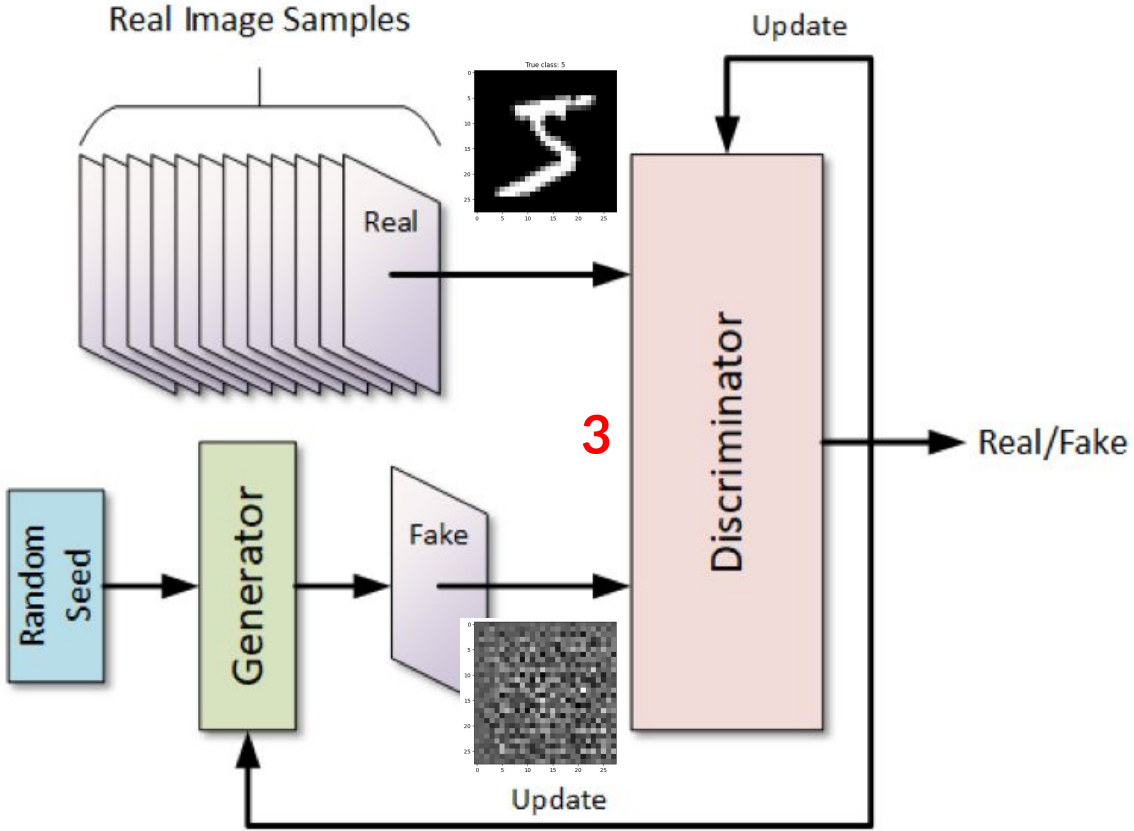
GAN


Real Image Samples
Update
Real
Discriminator
Real/Fake
1
Random Seed
Generator
Fake
Update

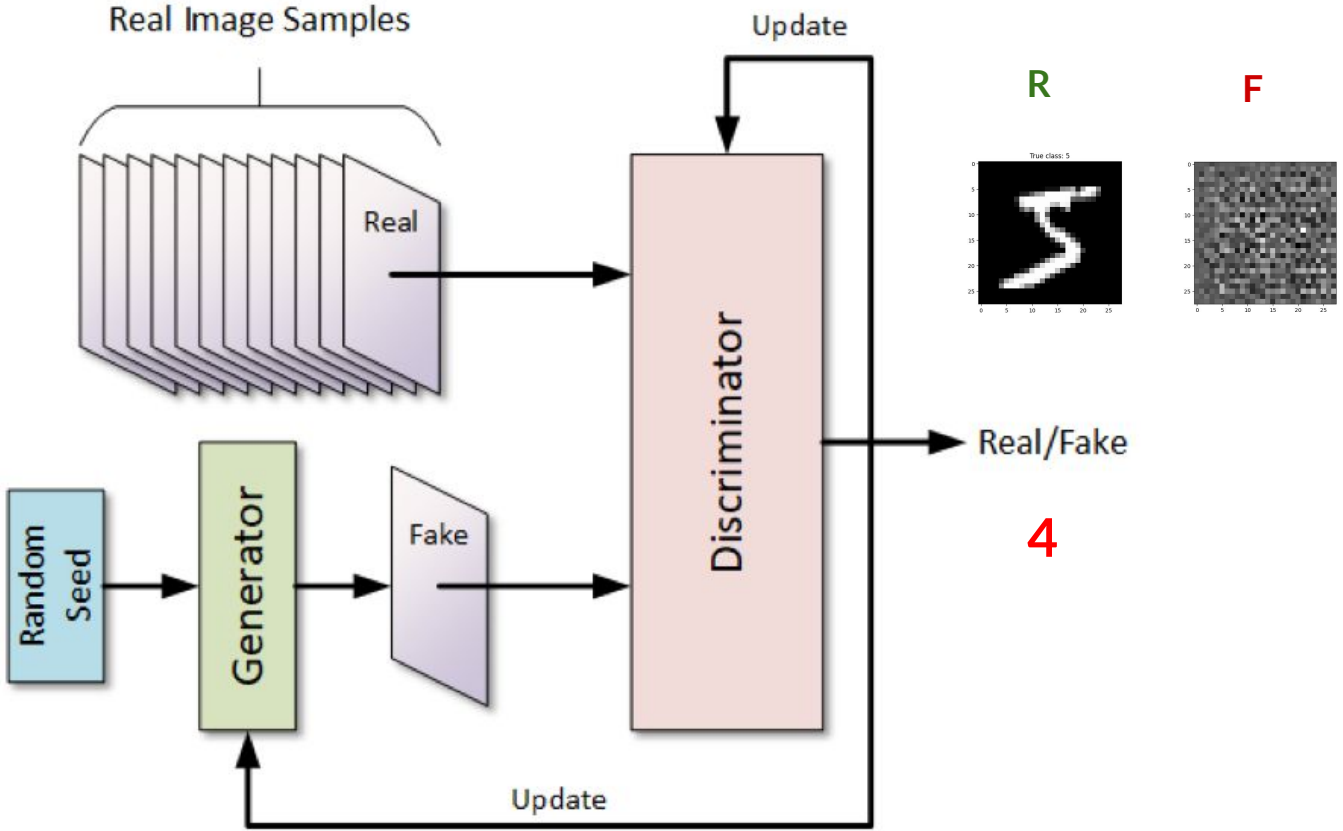
GAN


Real Image Samples
Update
Real
Discriminator
Real/Fake
Random Seed
Generator
Fake
2
Update

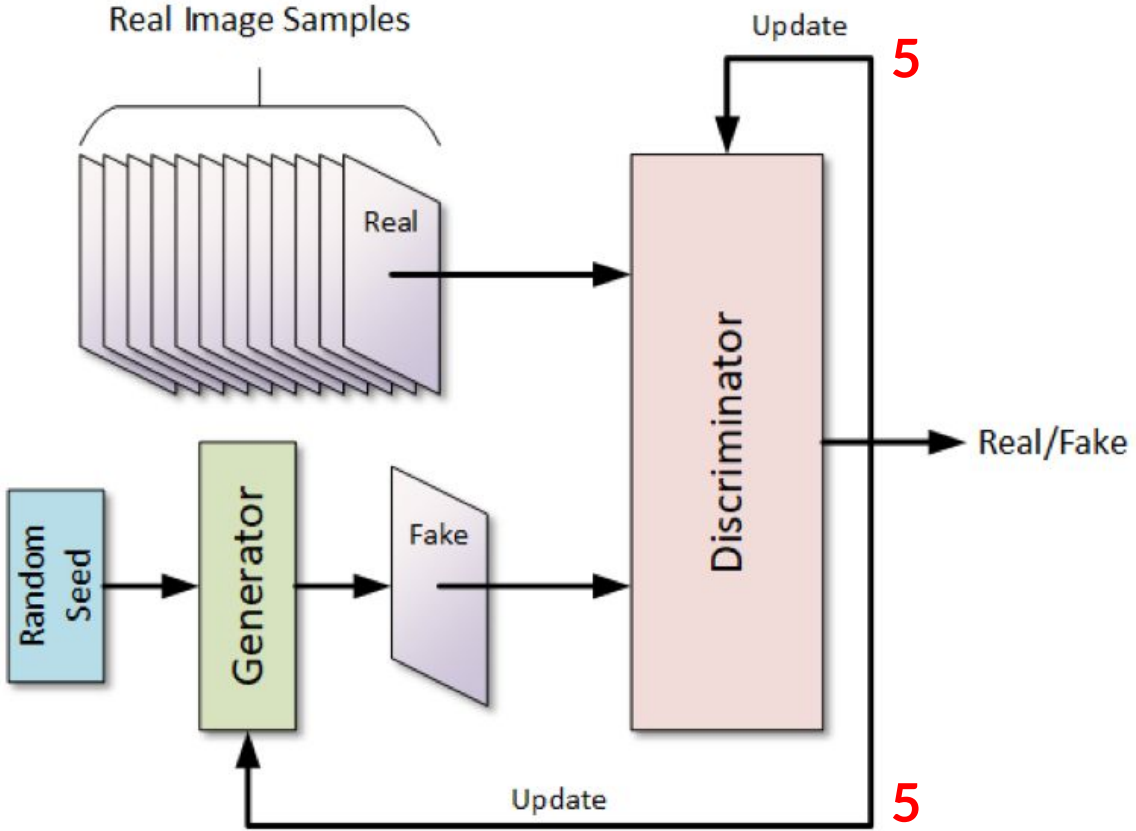
GAN


Real Image Samples
Update
Real
3
Discriminator
Real/Fake
Random Seed
Generator
Fake
Update

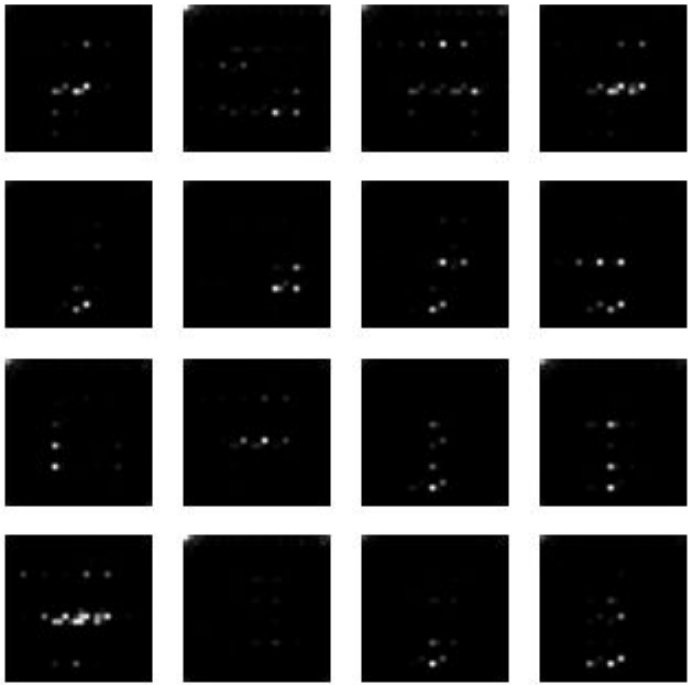
GAN


Real Image Samples
Update
R
F
Real
Discriminator
Real/Fake
4
Random Seed
Generator
Fake
Update

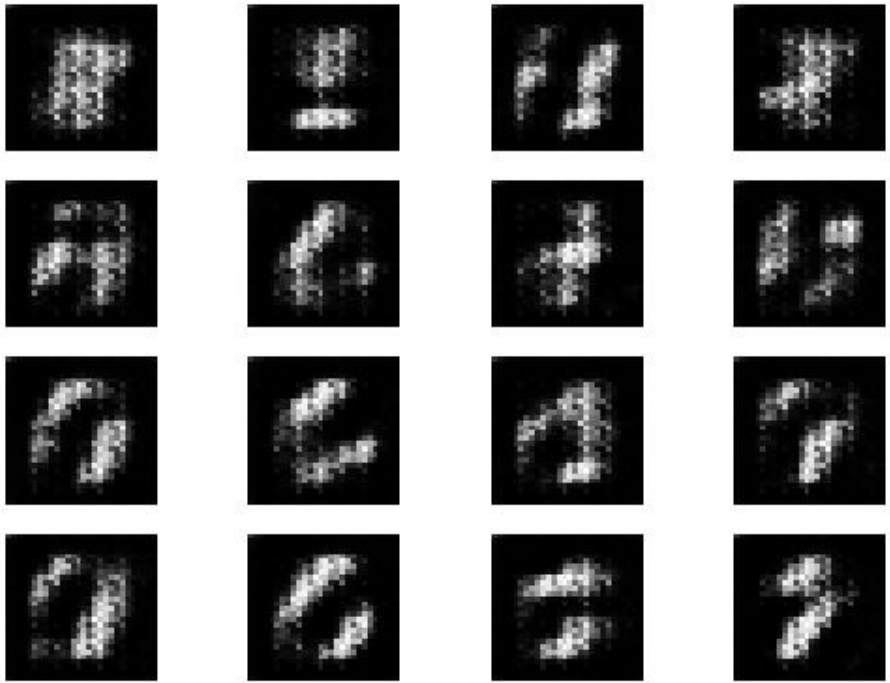
GAN


Real Image Samples
Update
5
Real
Discriminator
Real/Fake
Random Seed
Generator
Fake
Update
5

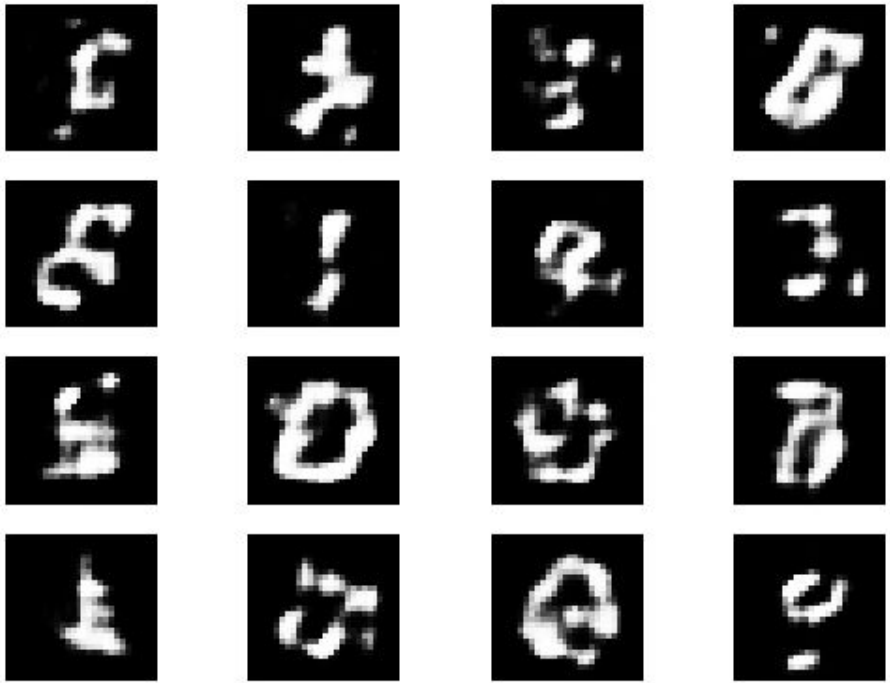
100 epochs



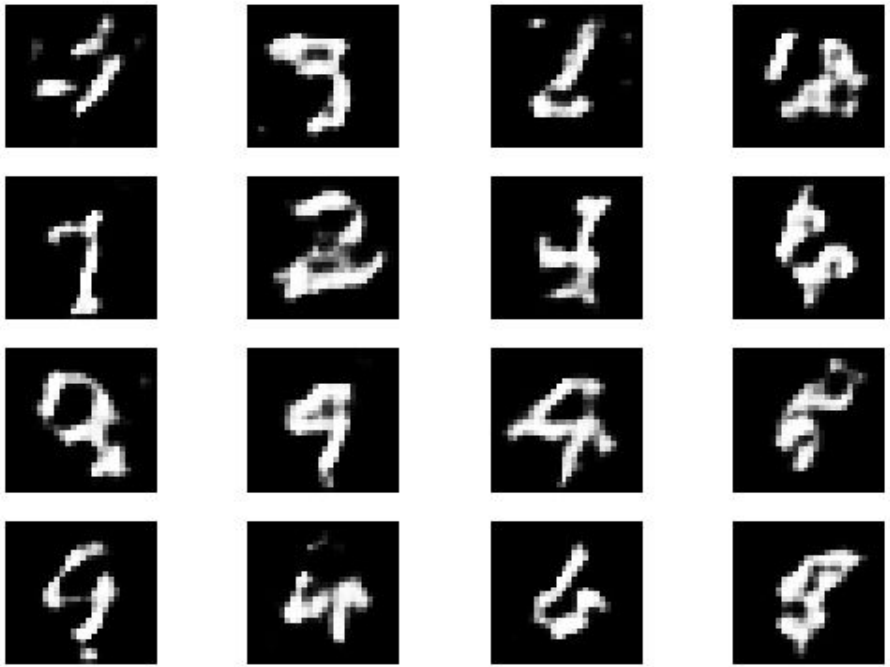
195 epochs



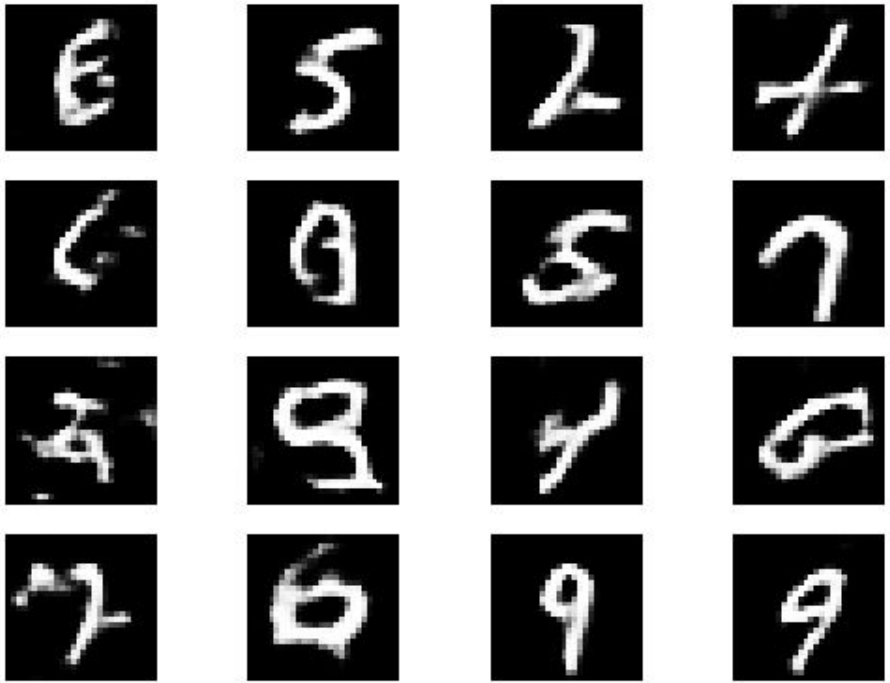
390 epochs



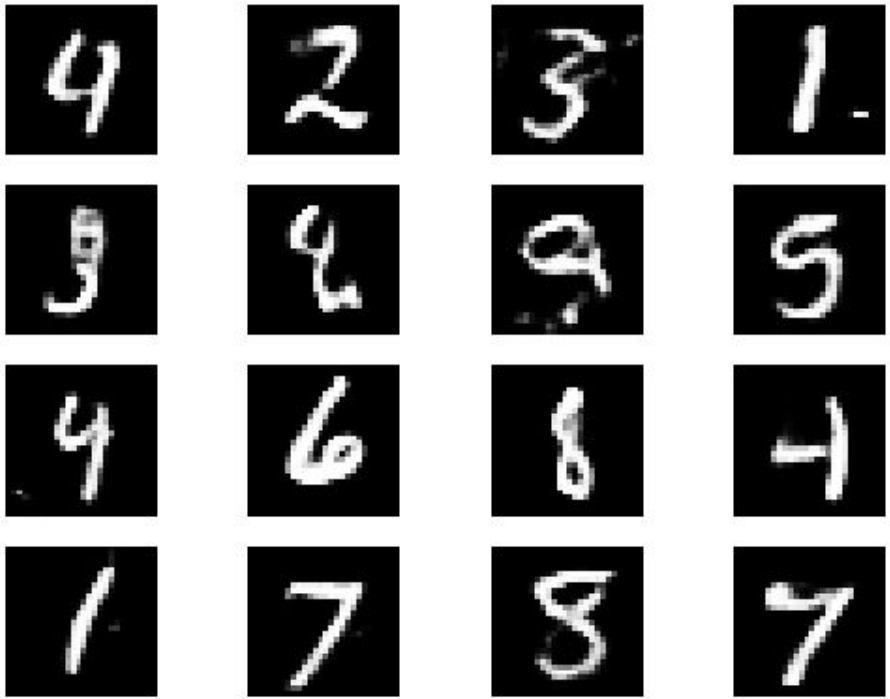
780 epochs



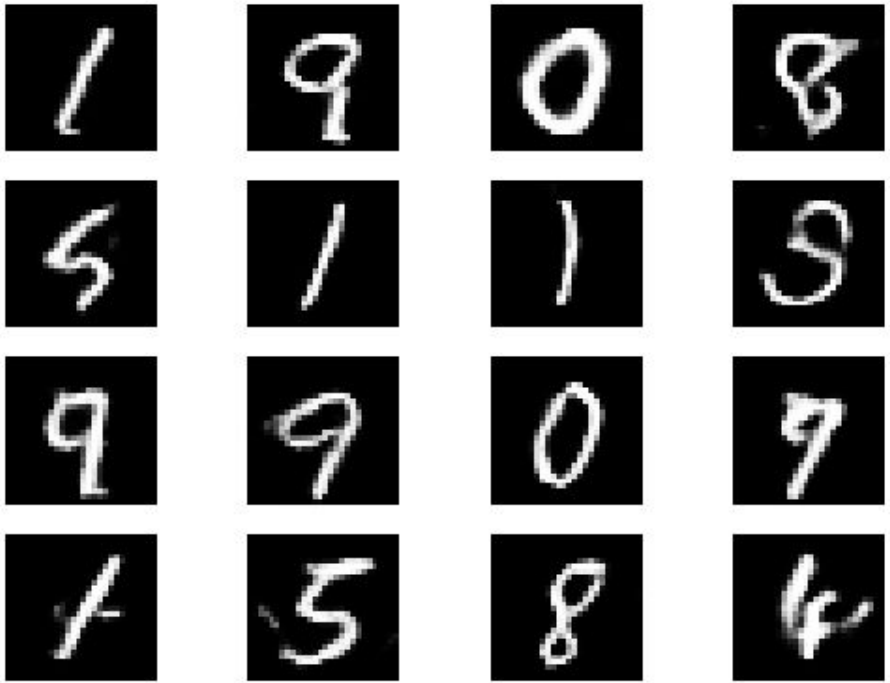
2145 epochs



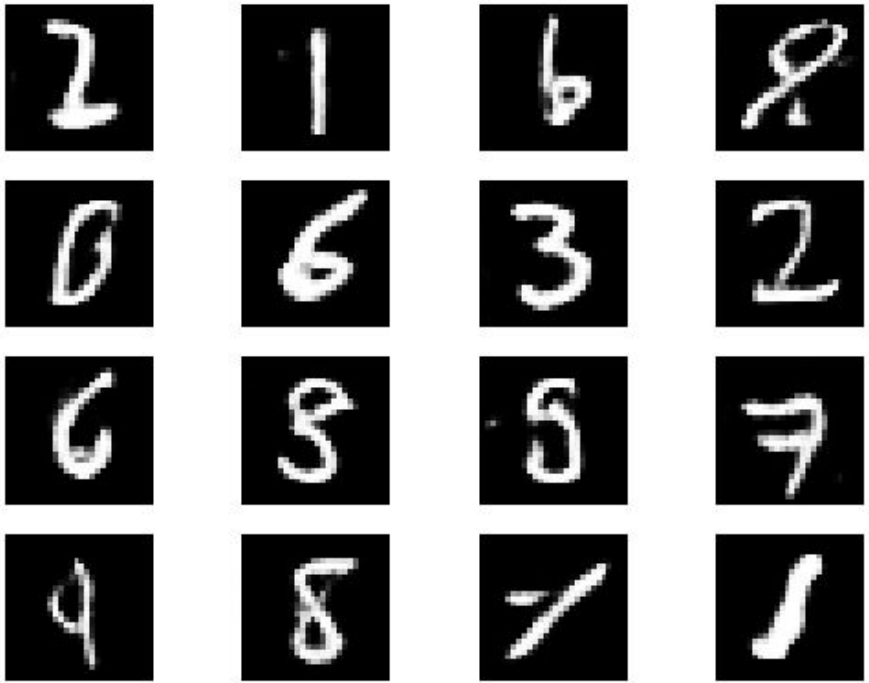
3900 epochs



7800 epochs



9750 epochs



Resources

- https://www.tensorflow.org/tutorials/generative/dcgan
- https://machinelearningmastery.com/how-to-develop-a-generative-adversarial-network-for-an-mnist-handwritten-digits-from-scratch-in-keras/
- https://arxiv.org/pdf/1406.2661.pdf