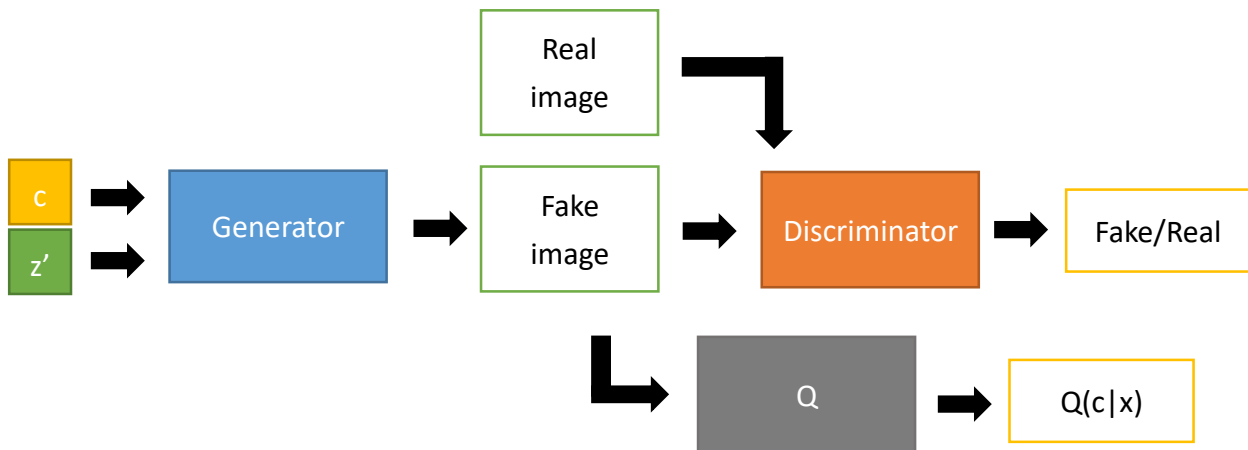


# Lab 4: InfoGAN

## 1. Introduction



**C is conditional laten code**

→ 10-D discrete one hot vector. E.g., (0, 1, 0, 0, 0, 0, 0, 0, 0, 0)

**Z' is noises**

→ 54-D continuous noise drawn from standard normal distribution

## 2. Implementation details

- Describe your generator and discriminator architectures.

**Discriminator:**

```
D(
  (main): Sequential(
    (0): Conv2d(1024, 128, kernel_size=(1, 1), stride=(1, 1))
    (1): BatchNorm2d(128, eps=1e-05, momentum=0.1, affine=True, track_running_stats=True)
    (2): ReLU(inplace=True)
    (3): Conv2d(128, 1, kernel_size=(1, 1), stride=(1, 1))
    (4): Sigmoid()
  )
)
```

I add one conv2d to improve the discriminator try to decrease the D\_Loss.

**DLoss = BCELoss(prob\_real, real\_label) + BCELoss(prob\_fake, fake\_label)**

## Generator:

```
G(
  (main): Sequential(
    (0): ConvTranspose2d(64, 1024, kernel_size=(1, 1), stride=(1, 1), bias=False)
    (1): BatchNorm2d(1024, eps=1e-05, momentum=0.1, affine=True, track_running_stats=True)
    (2): ReLU(inplace=True)
    (3): ConvTranspose2d(1024, 128, kernel_size=(7, 7), stride=(1, 1), bias=False)
    (4): BatchNorm2d(128, eps=1e-05, momentum=0.1, affine=True, track_running_stats=True)
    (5): ReLU(inplace=True)
    (6): ConvTranspose2d(128, 64, kernel_size=(4, 4), stride=(2, 2), padding=(1, 1), bias=False)
    (7): BatchNorm2d(64, eps=1e-05, momentum=0.1, affine=True, track_running_stats=True)
    (8): ReLU(inplace=True)
    (9): ConvTranspose2d(64, 1, kernel_size=(4, 4), stride=(2, 2), padding=(1, 1), bias=False)
    (10): Sigmoid()
  )
)
```

I try to add more convTranspose2d to the generator model but got some error, so I try to turn it back and change other hyperparameters.

**Gloss = BCELoss(porb\_fake, real\_label) + CELoss(Q\_digits, target)**

- Specify the hyperparameters and setting (e.g. channels, learning rate, optimizer, epochs, etc.)

Channel: 64

Batch\_size: 100

Learning rate: (Generator) 0.0012 / (Discriminator) 0.0002

Optimizer: Adam

Epochs: 100

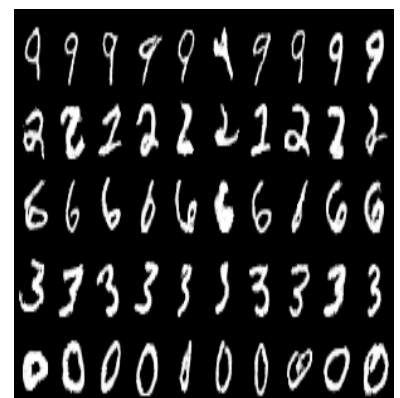
Epoch\_1



Epoch\_50



Epoch\_100

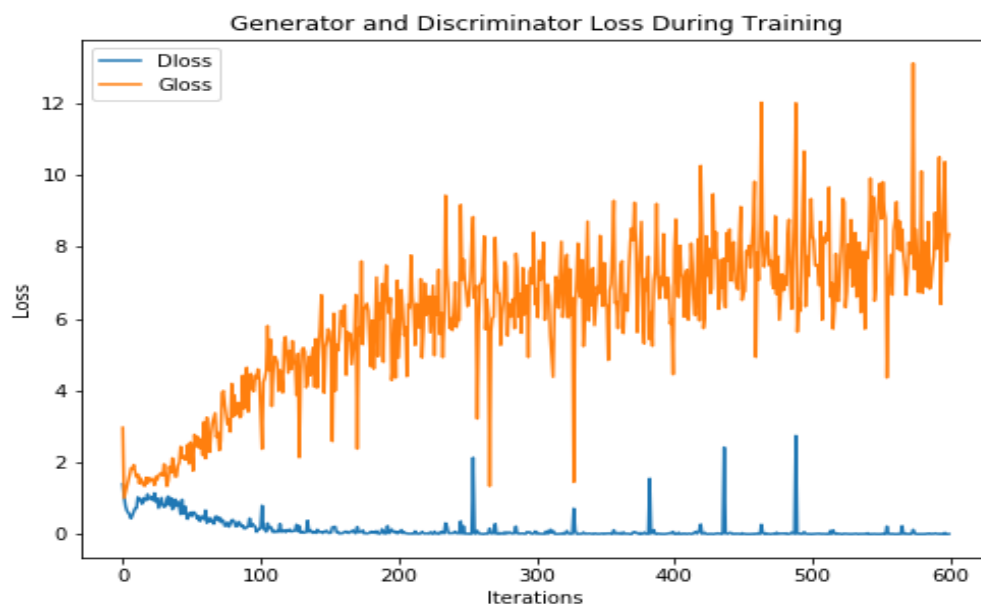


### 3. Results and discussion

- Show your results of all MNIST numbers (10%)



- Discuss your training process the results of the loss



I run the infoGAN model for 100 epoch, some of the digits are still strange in some noises when I was showing my results.

