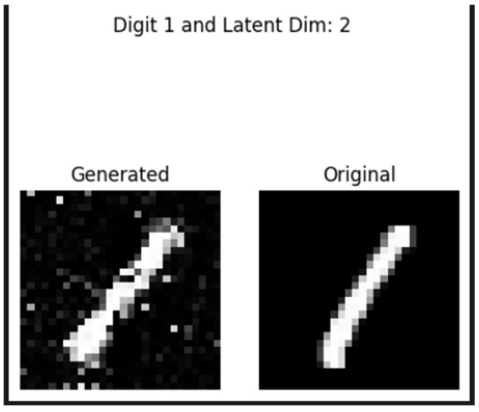
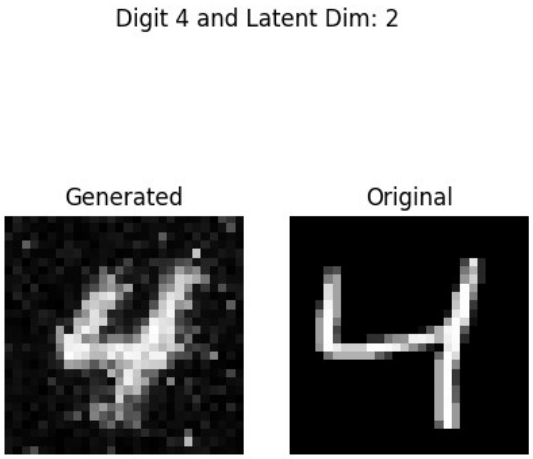
Assignment 2

GAN

2 dimensions





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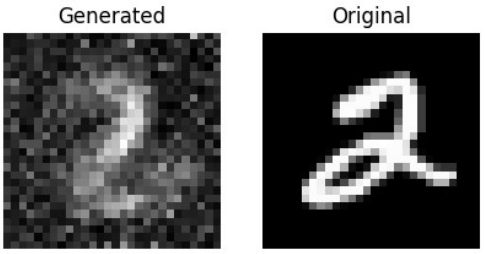
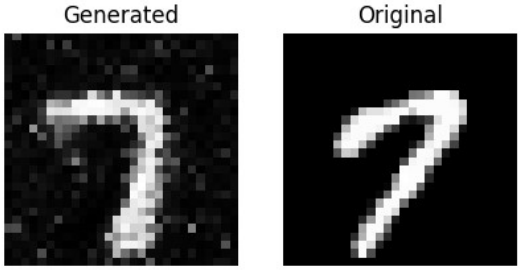
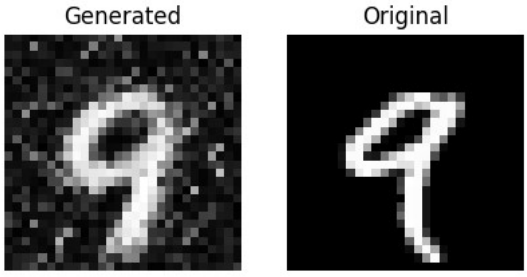




Digit 7 and Latent Dim: 2

Digit 9 and Latent Dim: 2



4 dimensions:

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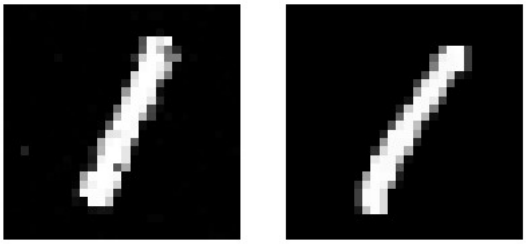

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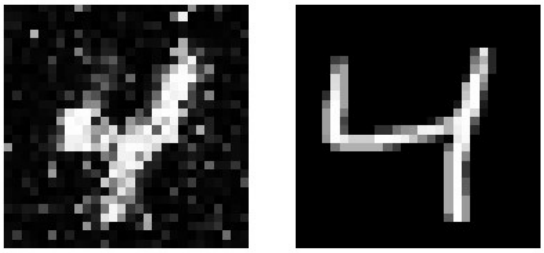

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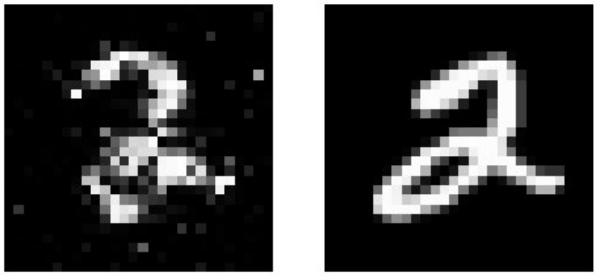

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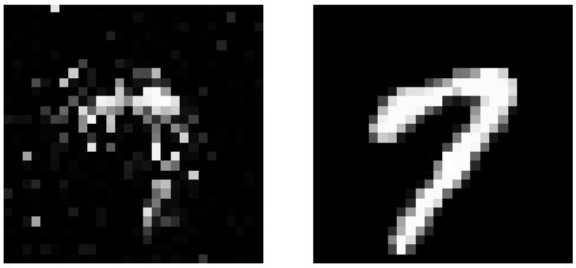

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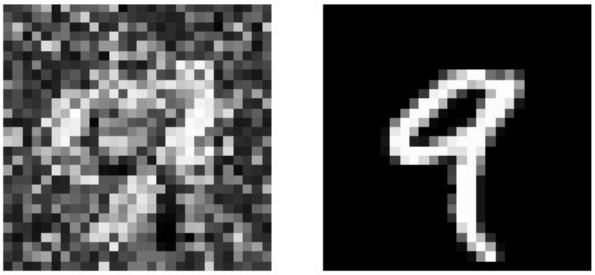

8 dimensions:

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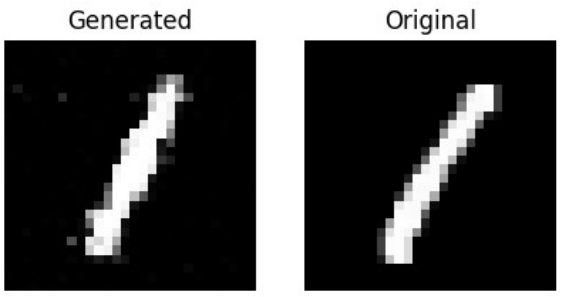

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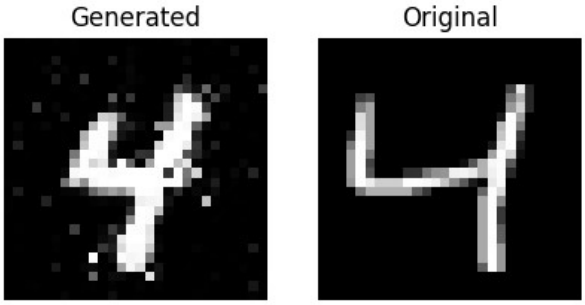

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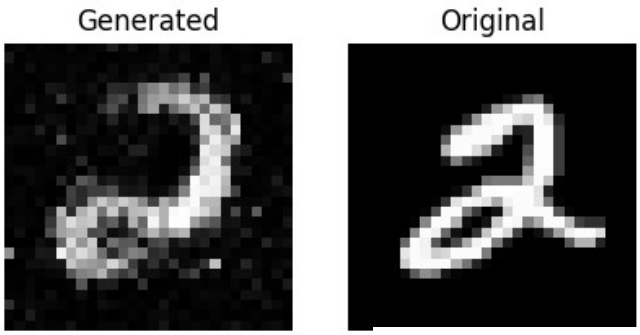

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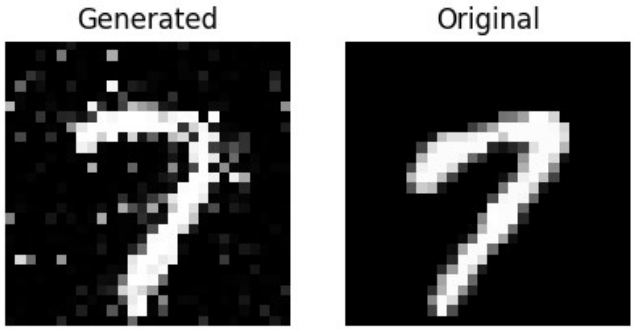

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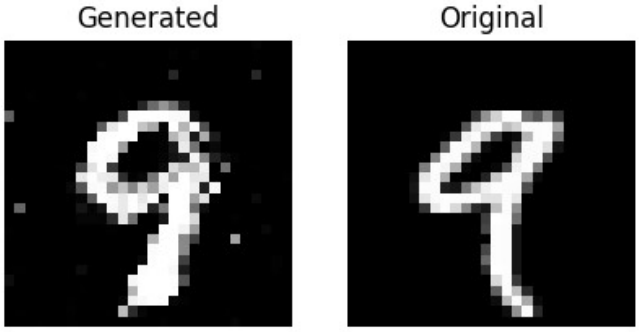

16 dimensions:

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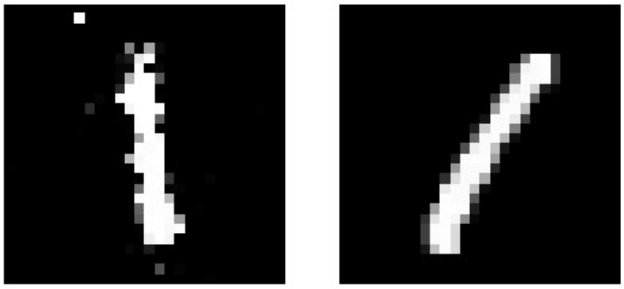

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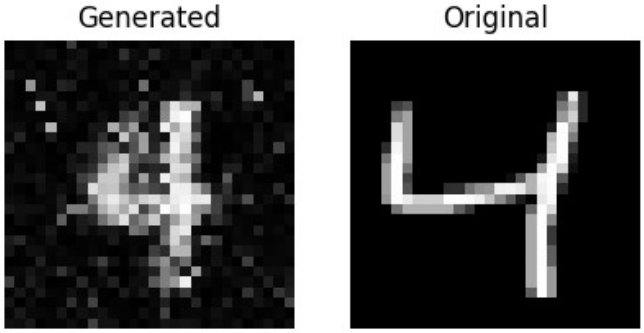

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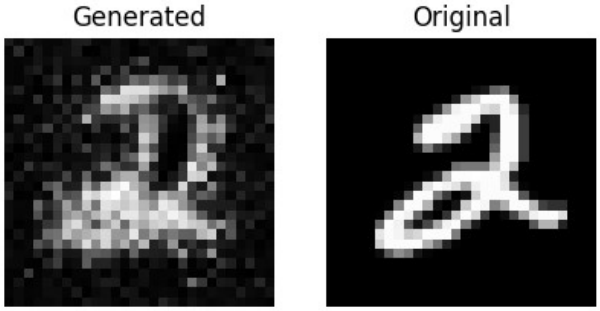

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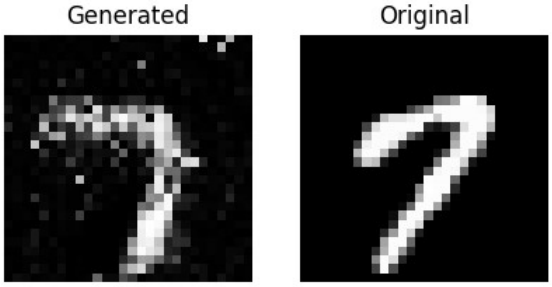

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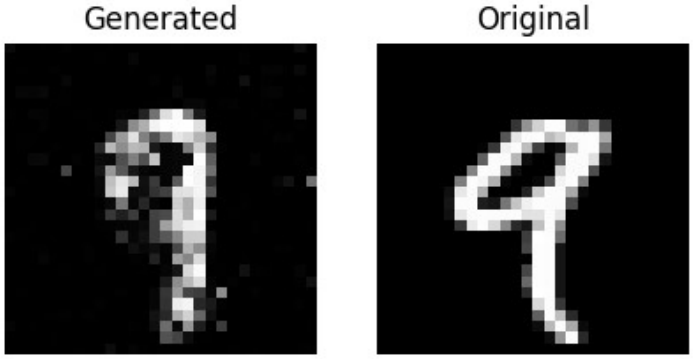

32 dimensions:

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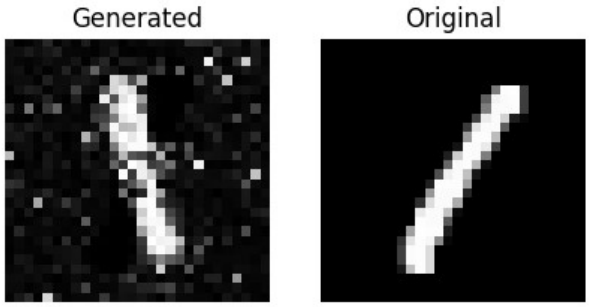

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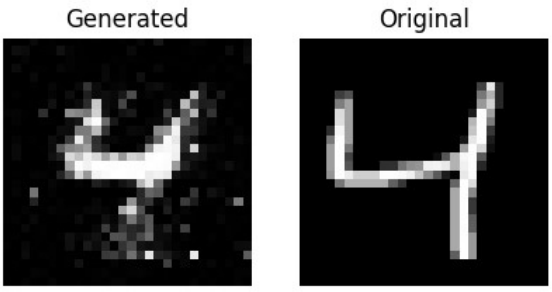

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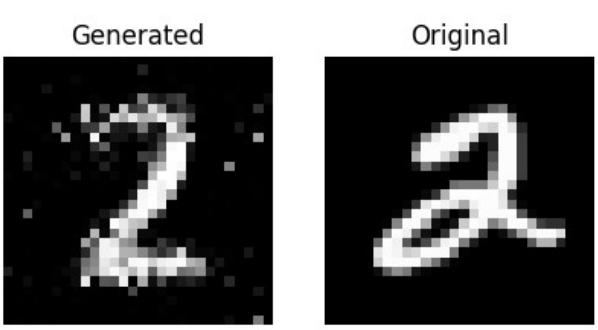

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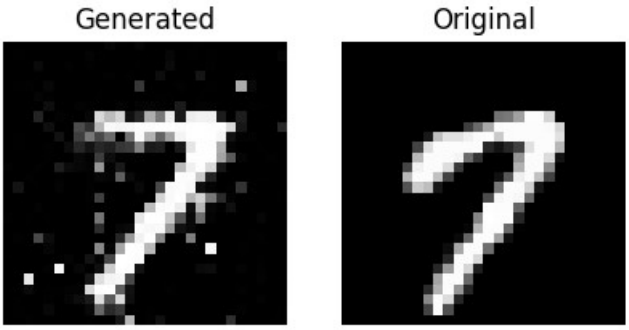

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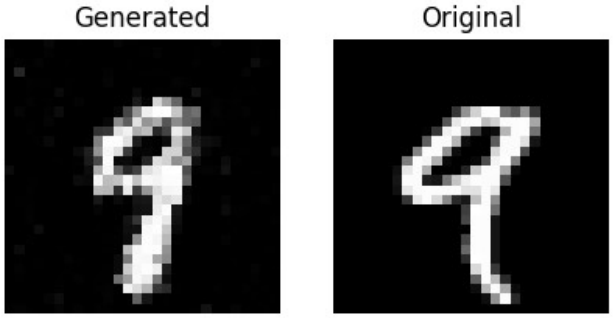

64 dimensions:

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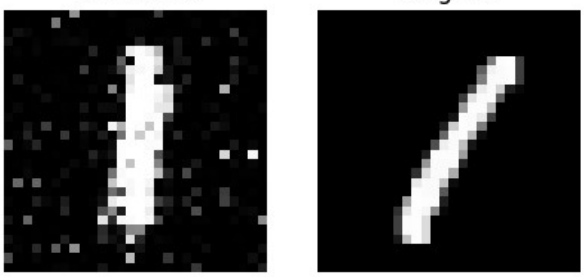

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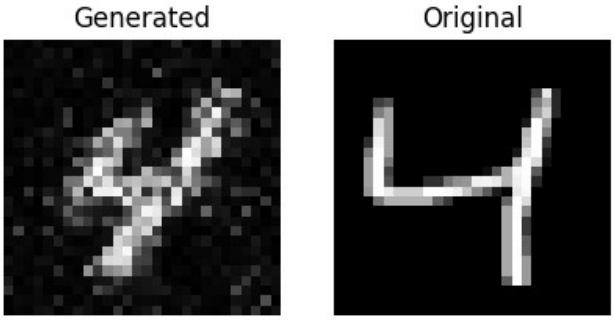

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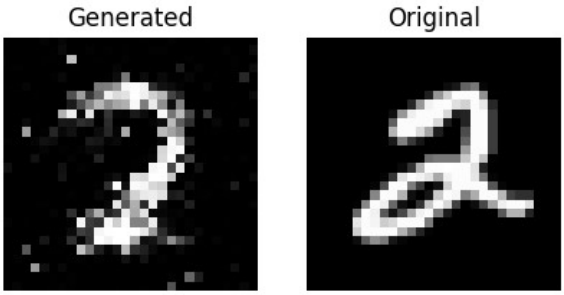

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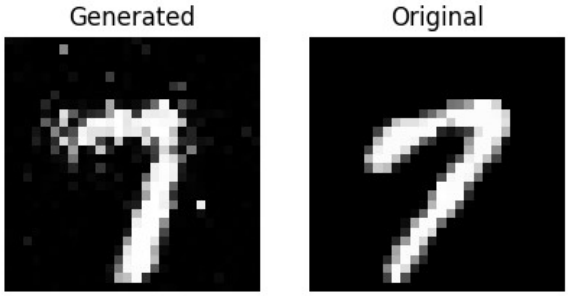

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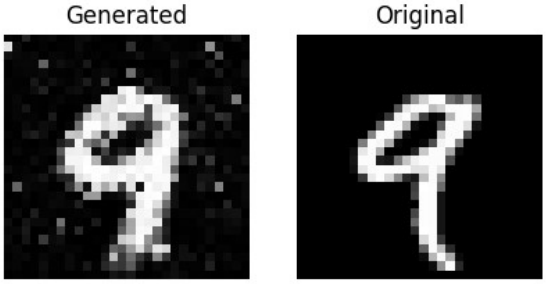

Diffusion Models

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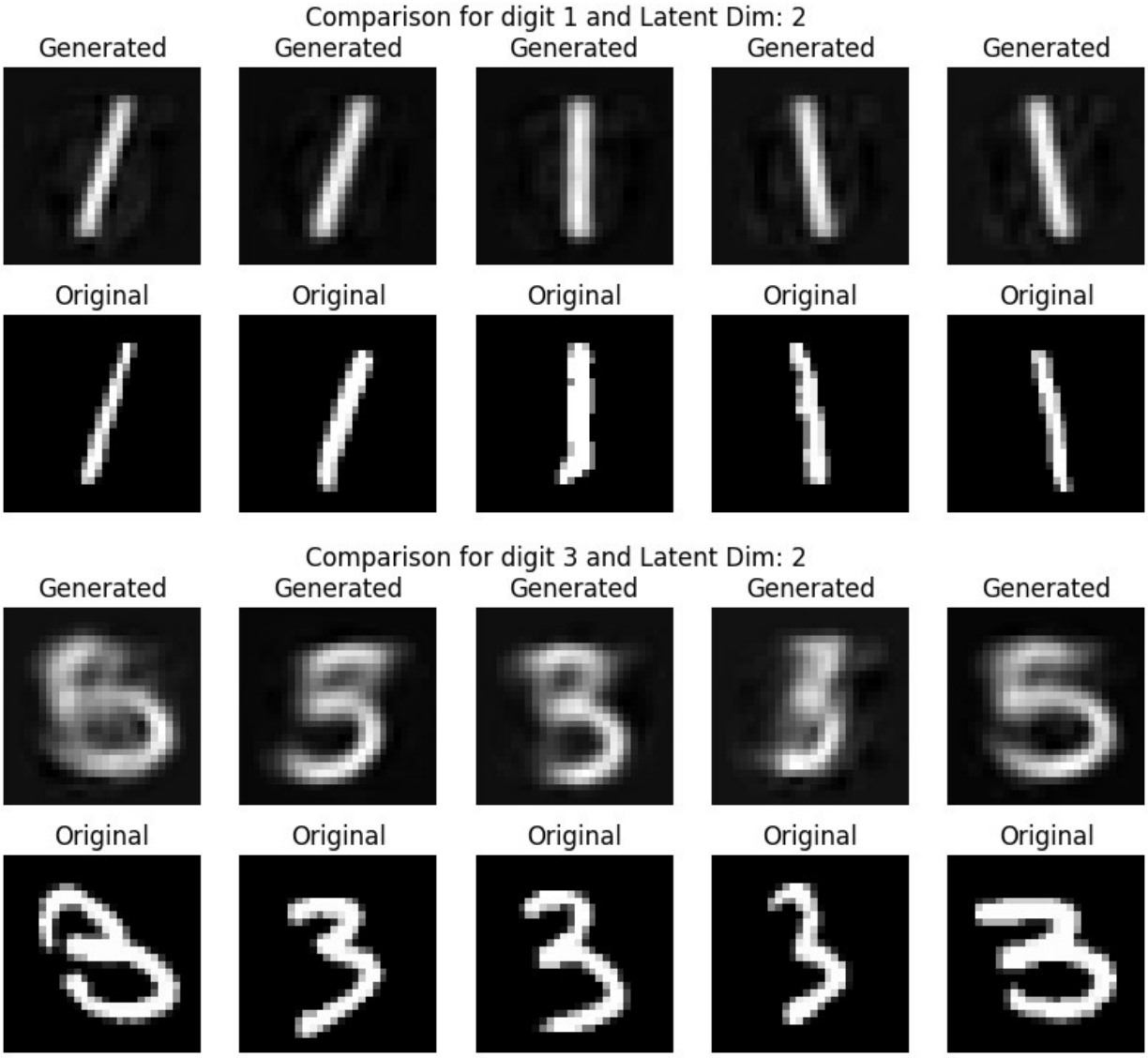

Comparison for digit 5 and Latent Dim: 2

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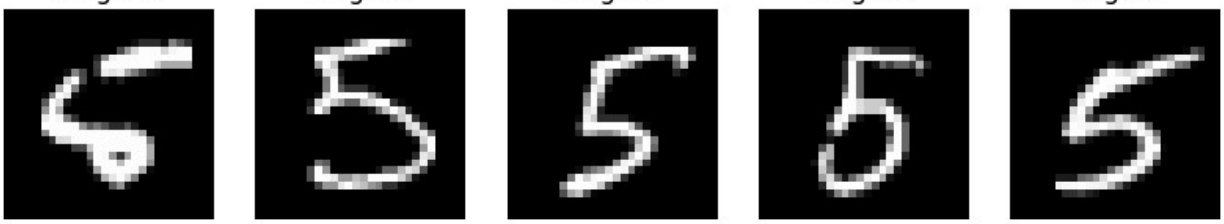

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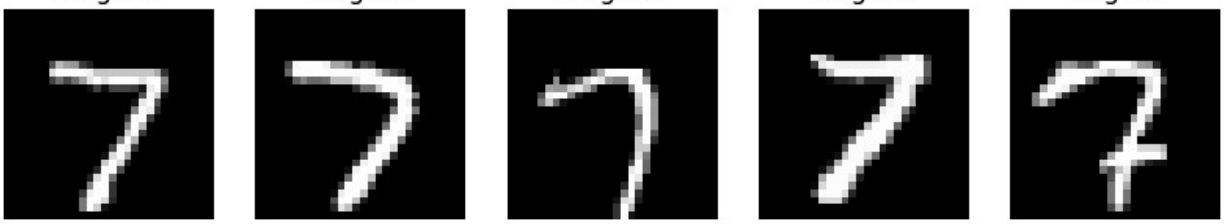

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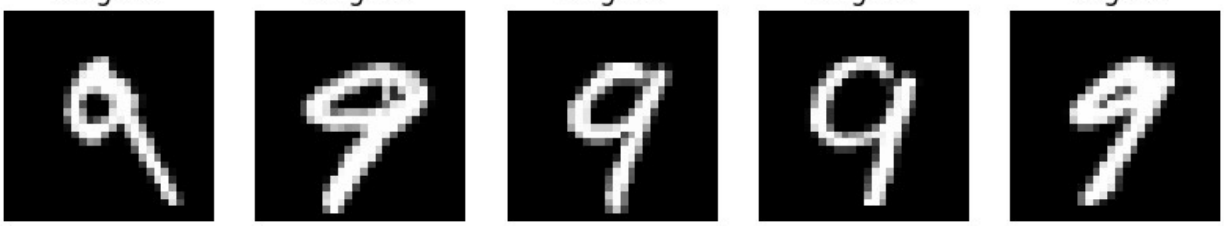

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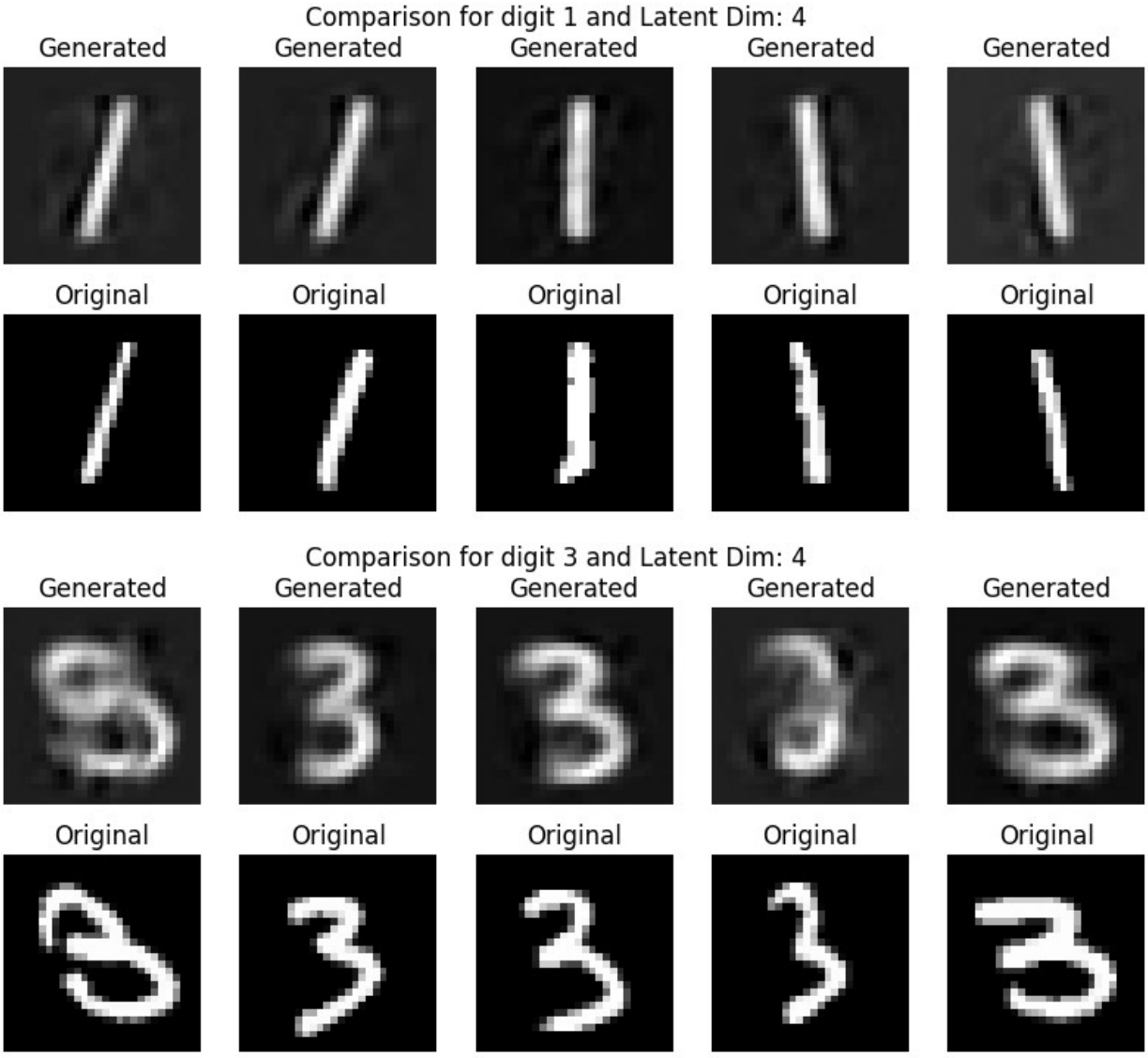

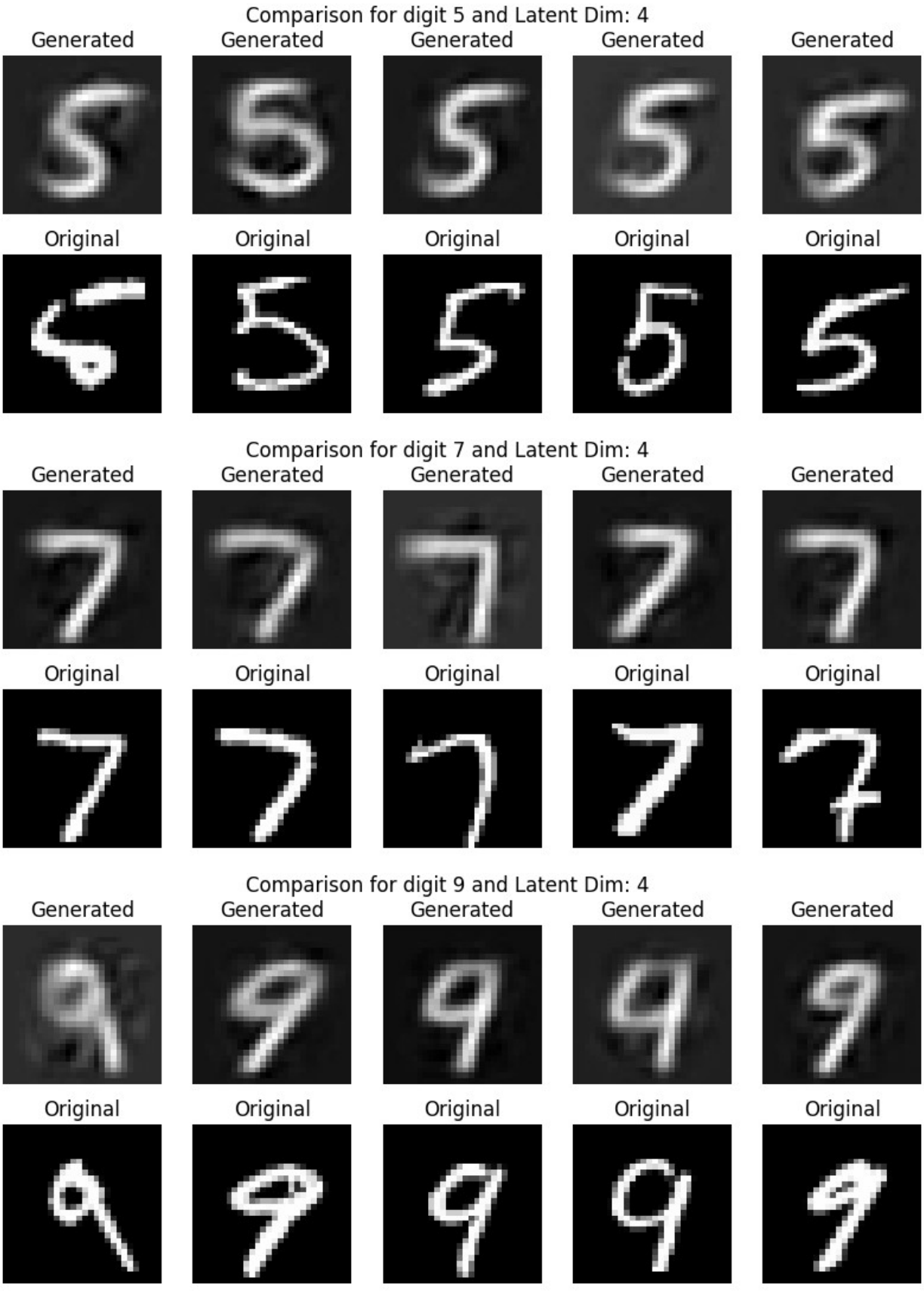
Comparison for digit 5 and Latent Dim: 4
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Comparison for digit 7 and Latent Dim: 4
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Comparison for digit 9 and Latent Dim: 4
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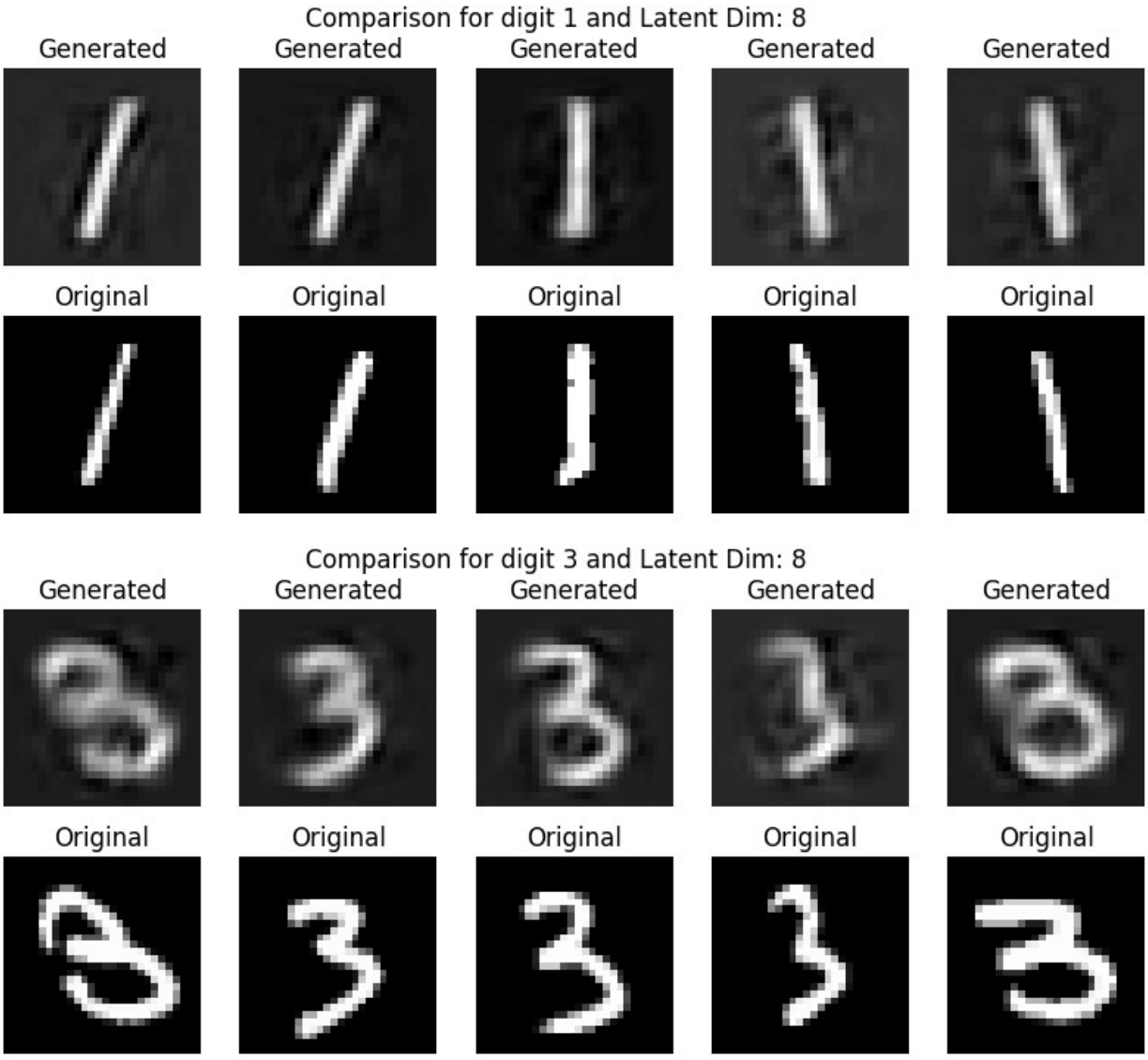
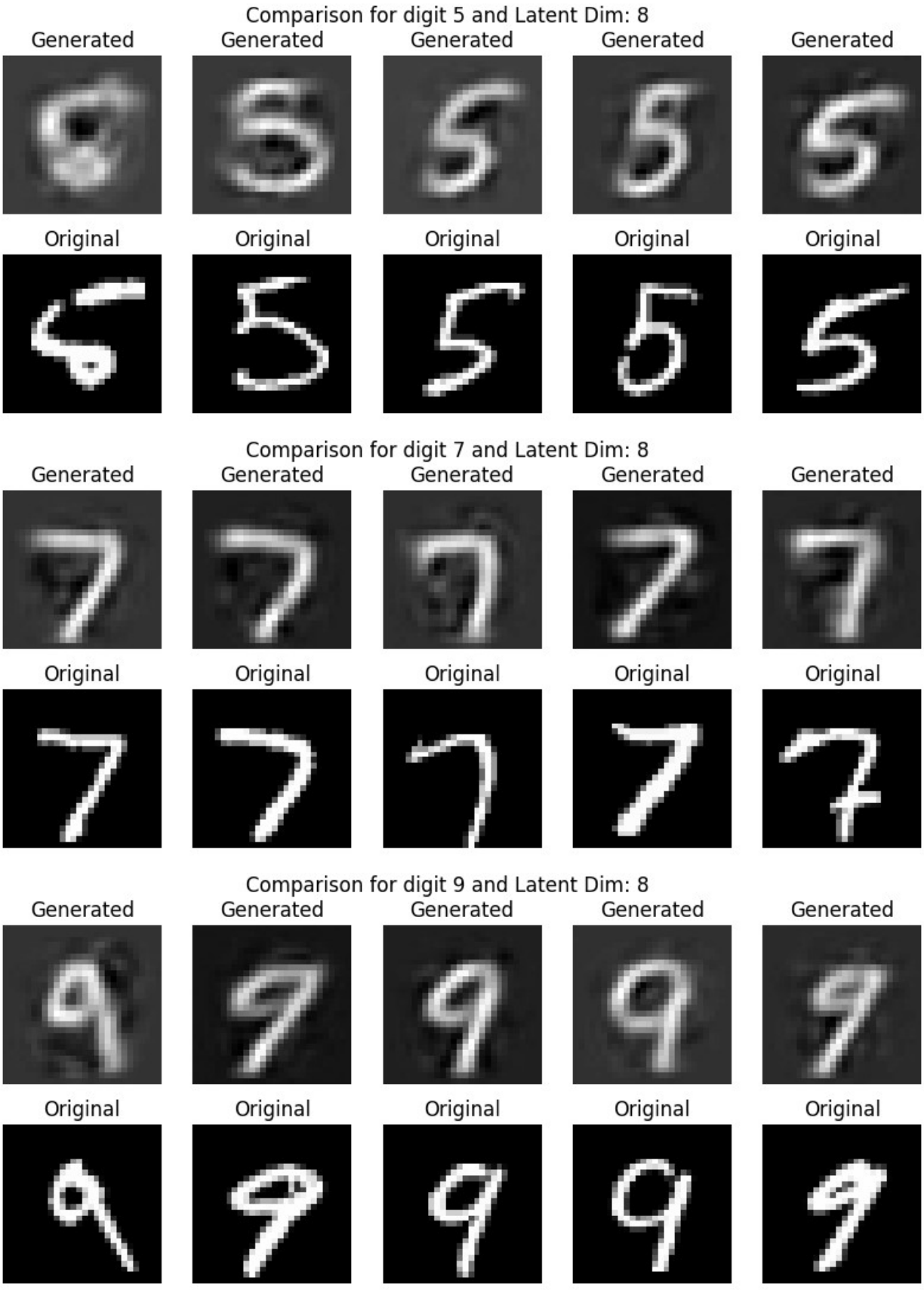
8 dimensions:

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Comparison for digit 9 and Latent Dim: 8
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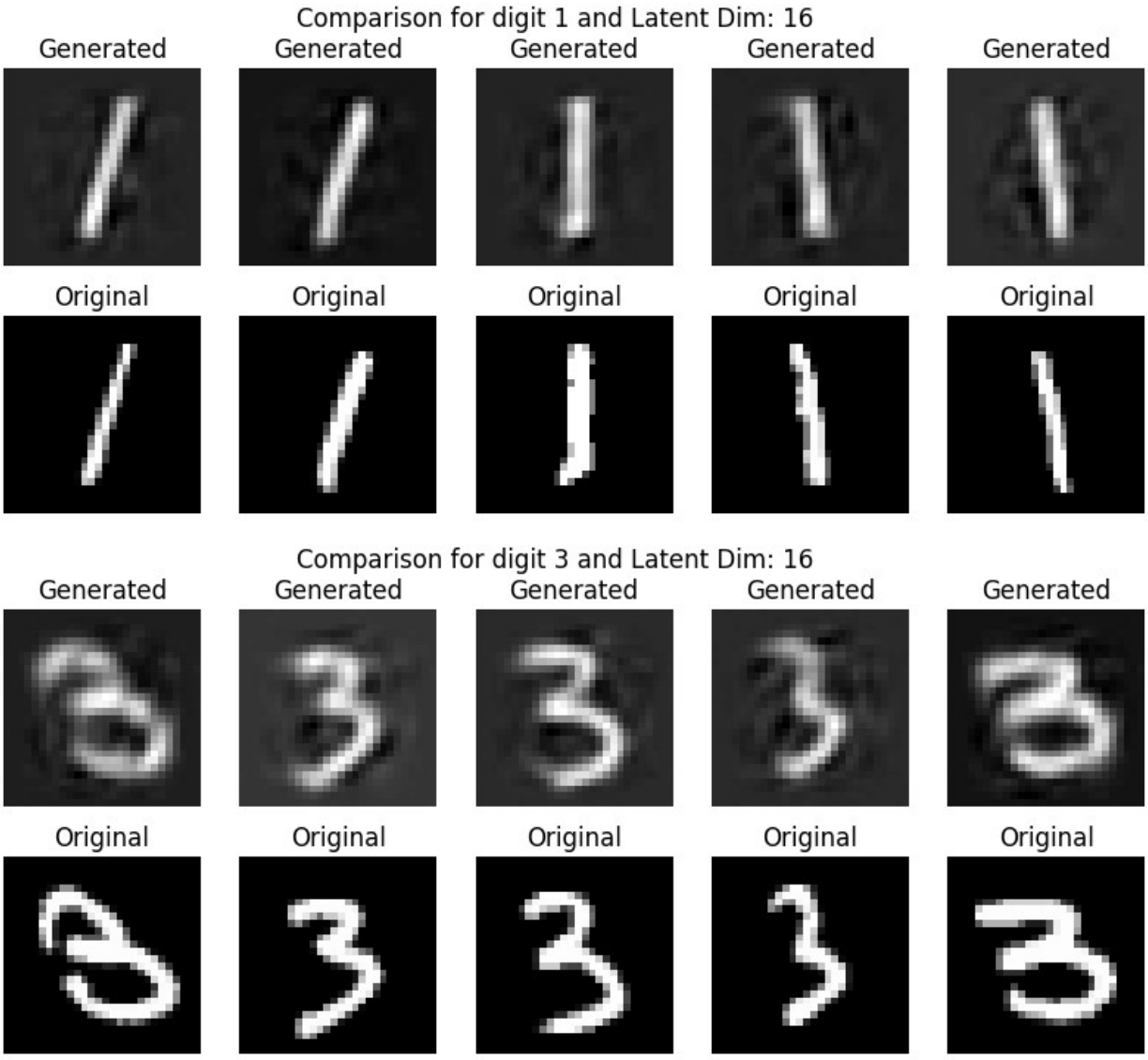
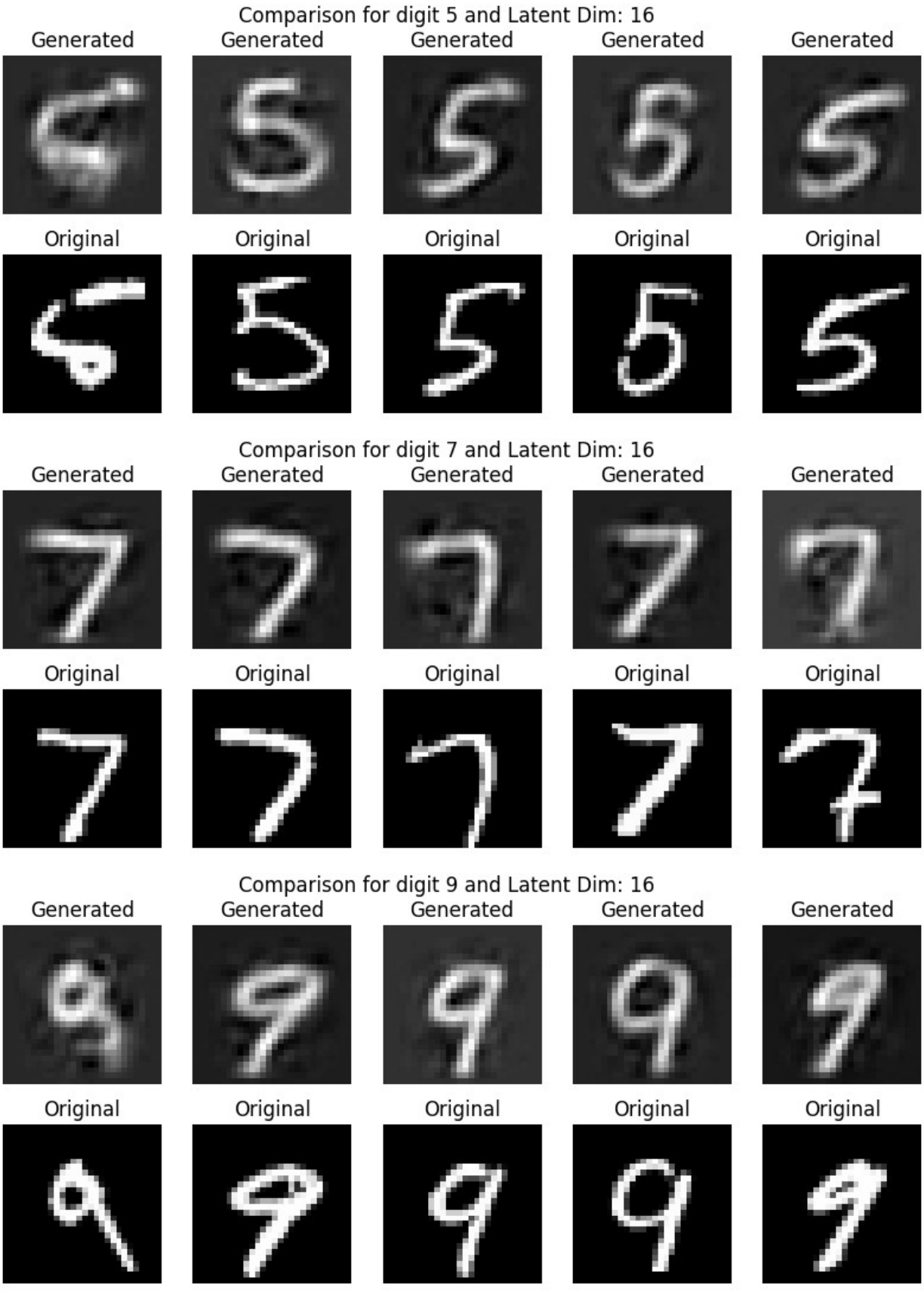
16 dimensions:




Comparison for digit 5 and Latent Dim: 16
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Comparison for digit 7 and Latent Dim: 16
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Comparison for digit 9 and Latent Dim: 16
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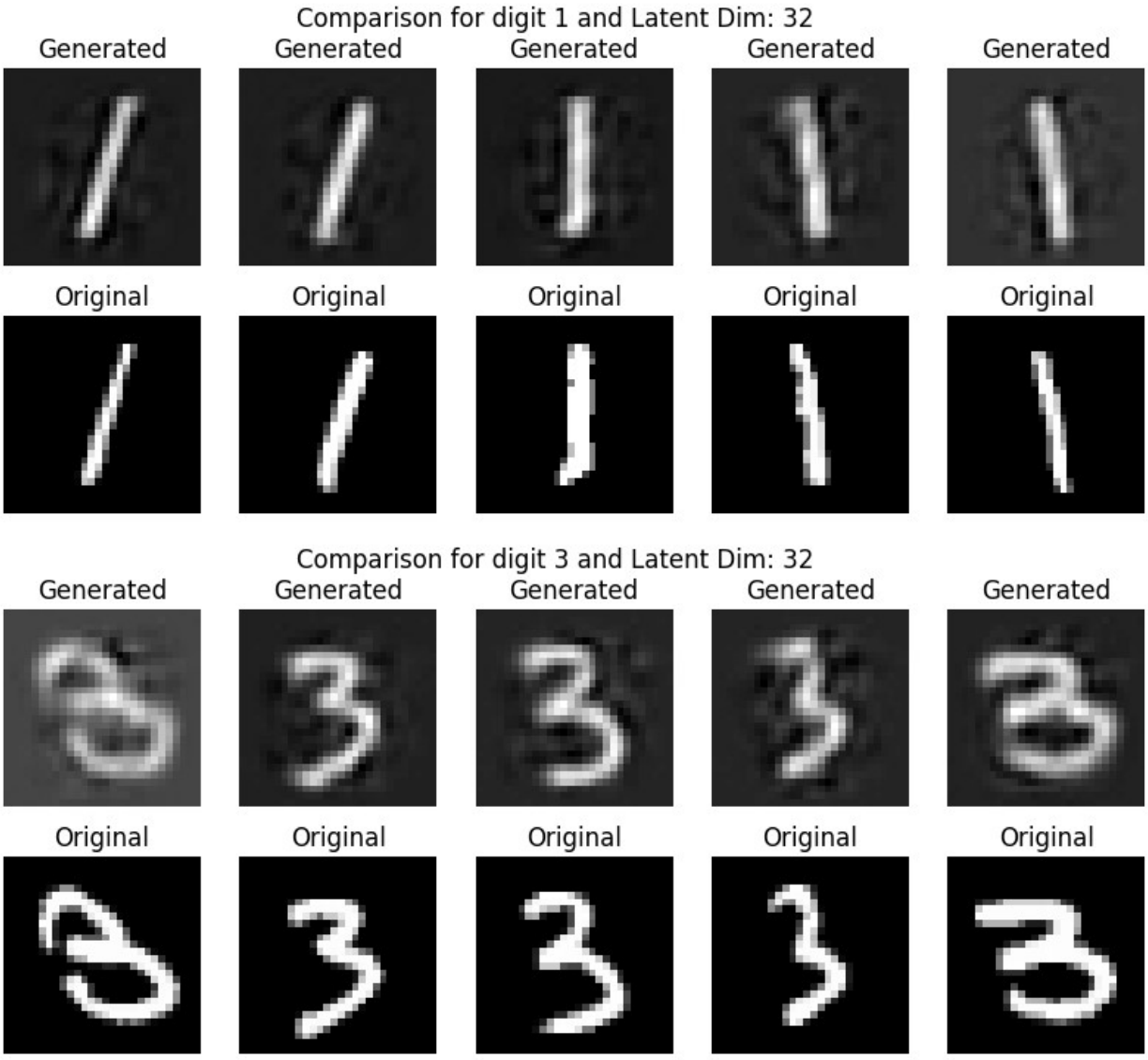
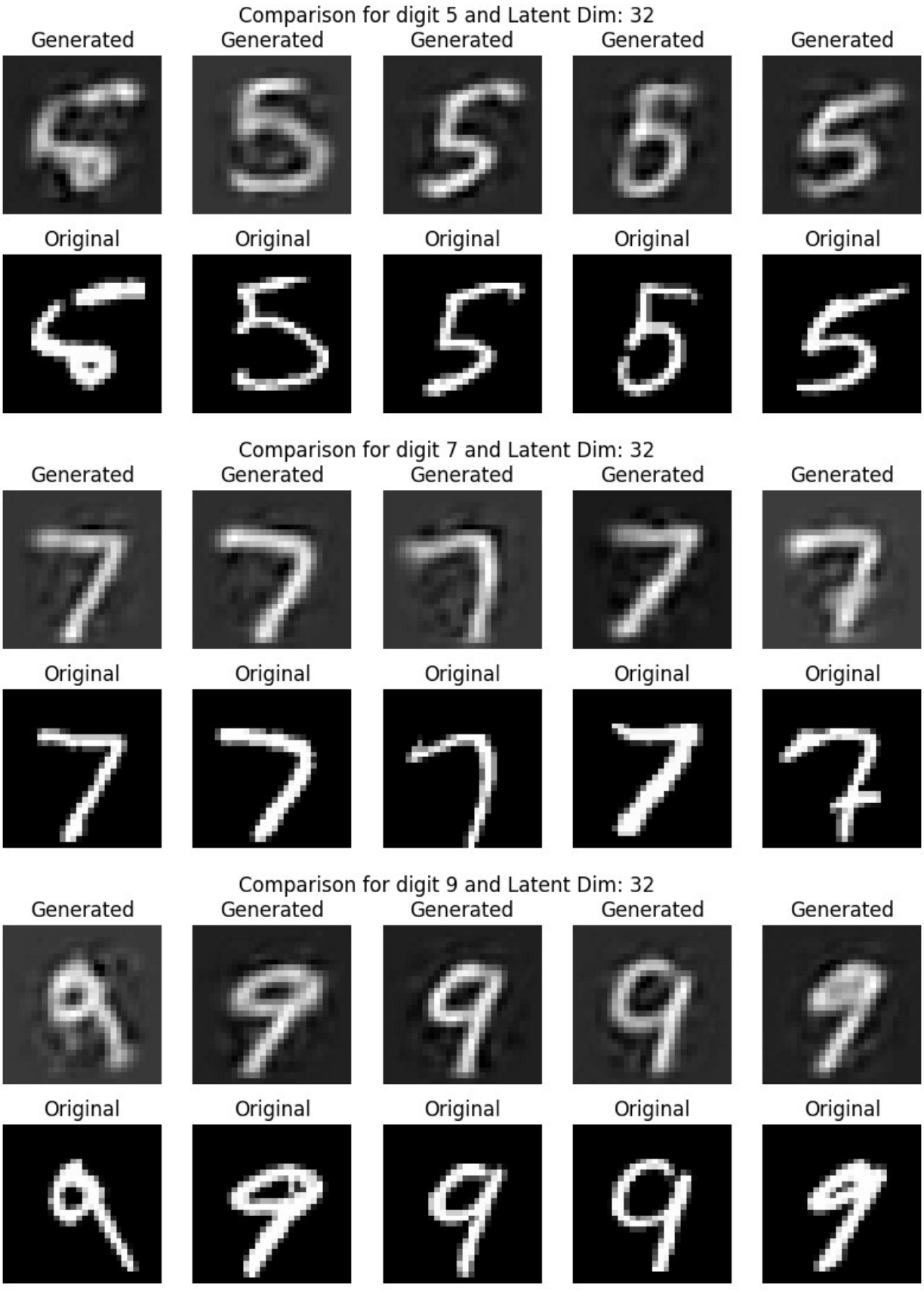
32 dimensions:




Comparison for digit 5 and Latent Dim: 32
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Comparison for digit 7 and Latent Dim: 32
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Comparison for digit 9 and Latent Dim: 32
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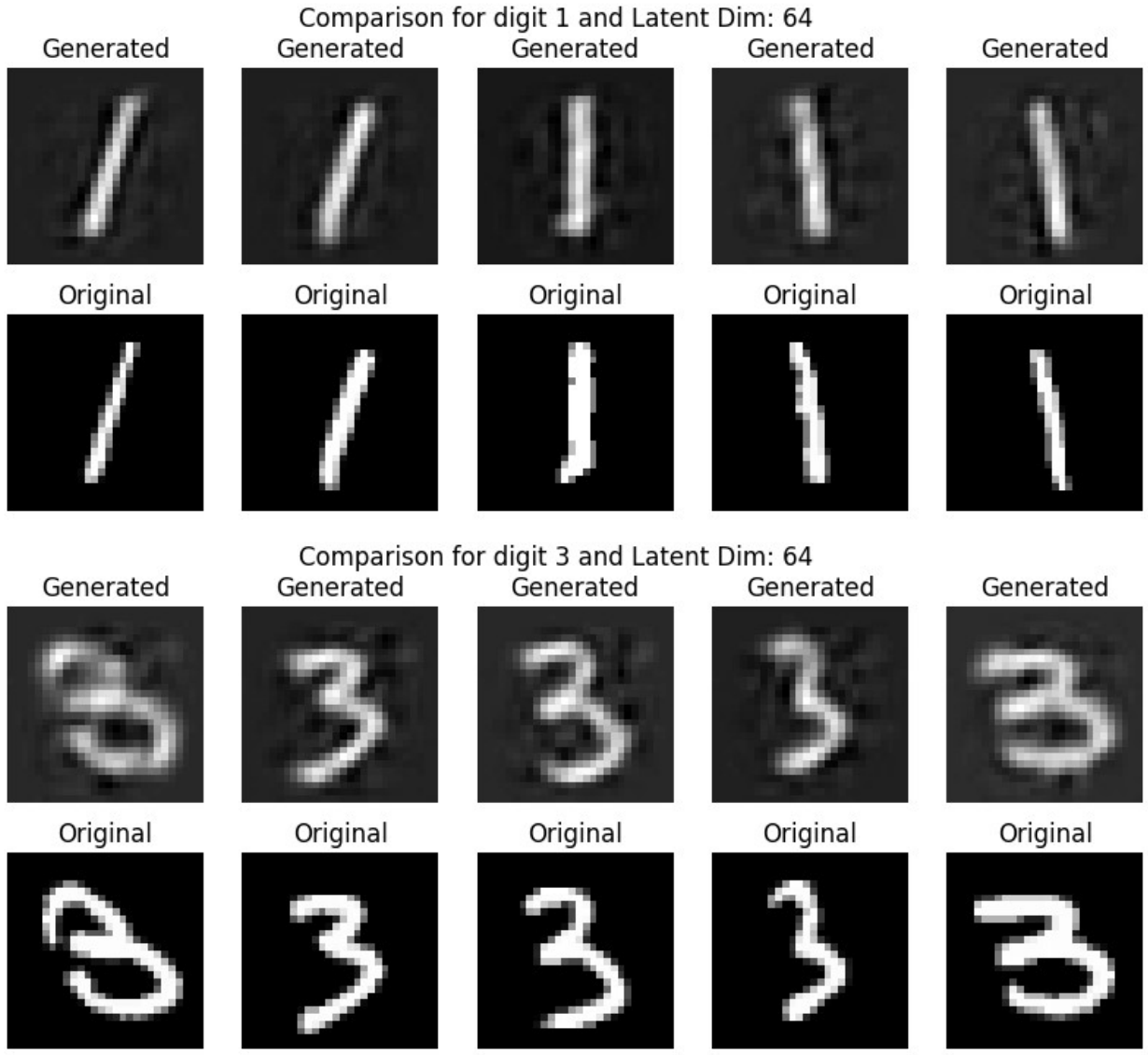
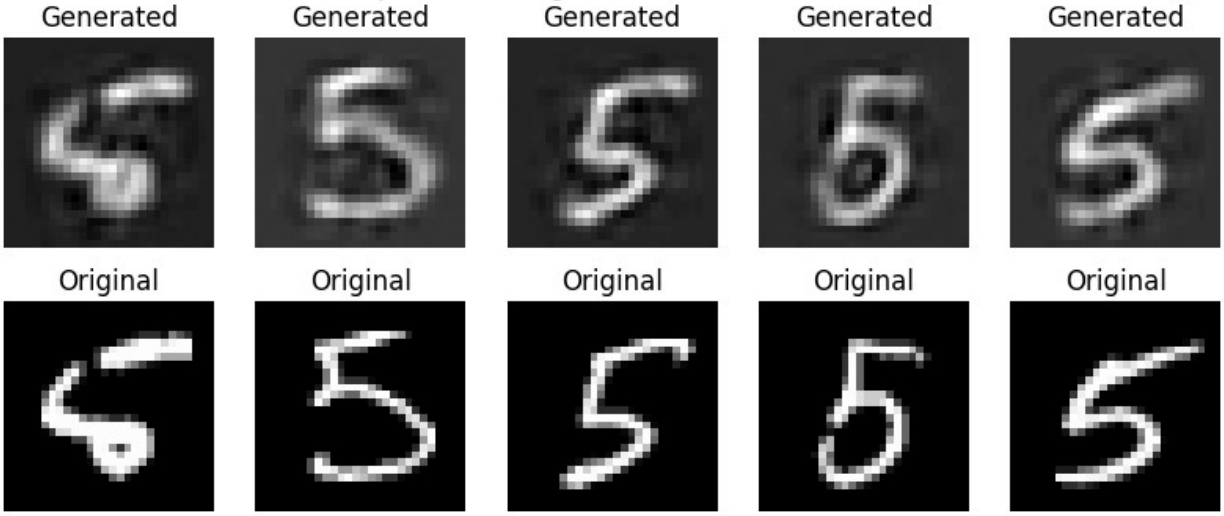
64 dimensions:



Comparison for digit 5 and Latent Dim: 64



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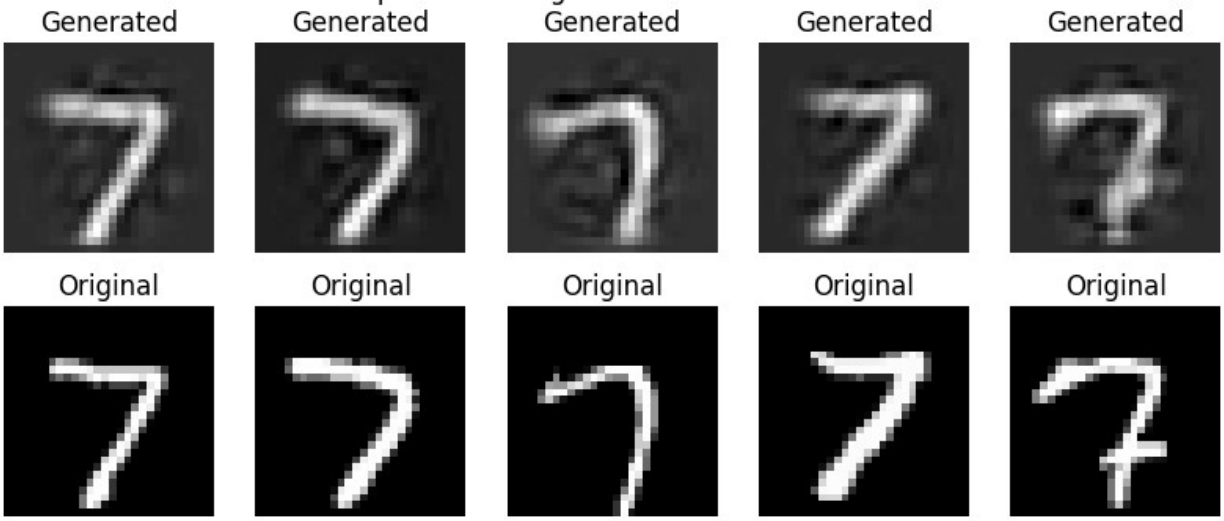
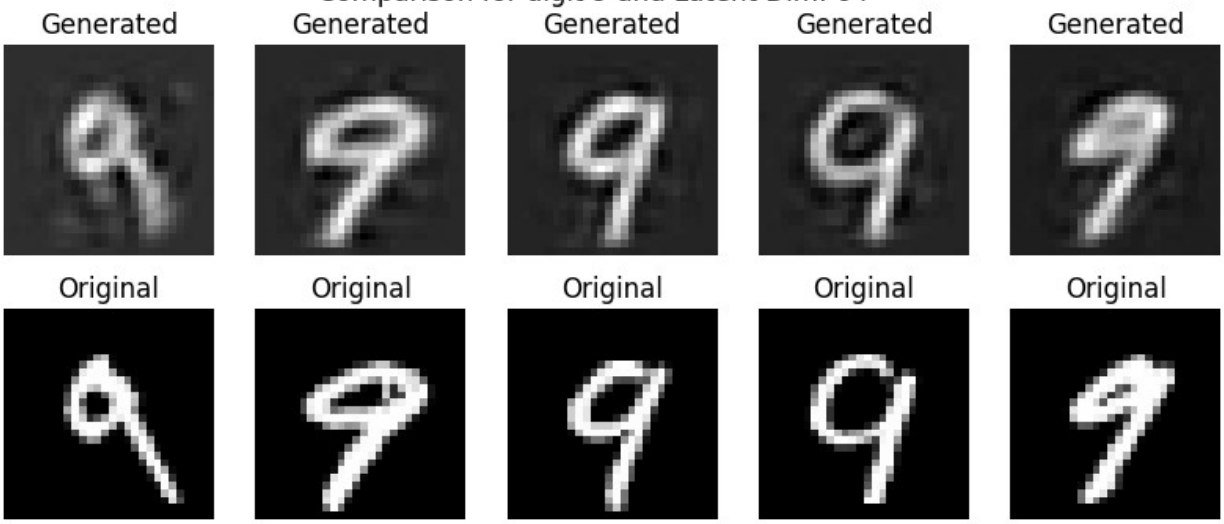
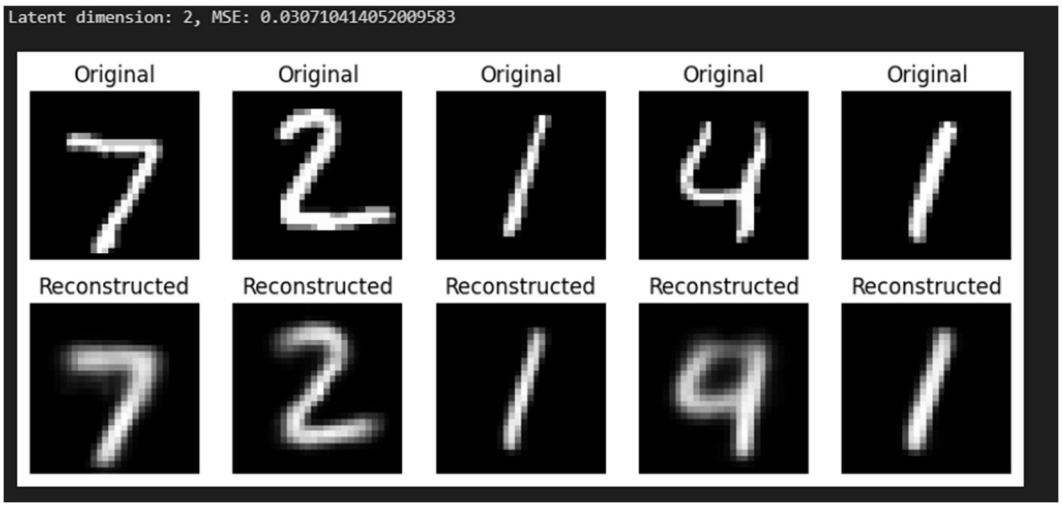


Comparison for digit 9 and Latent Dim: 64

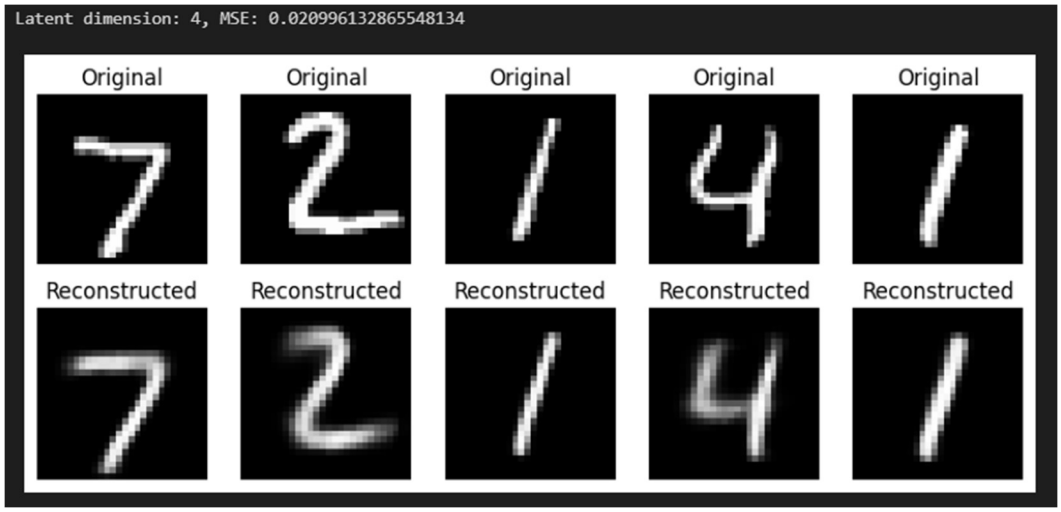


VAE

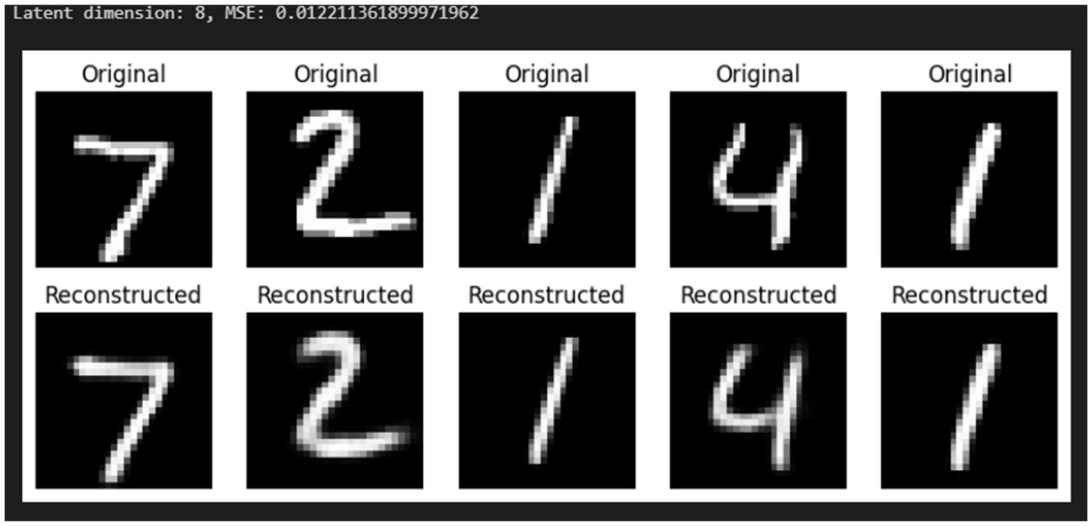
Latent Dim:2



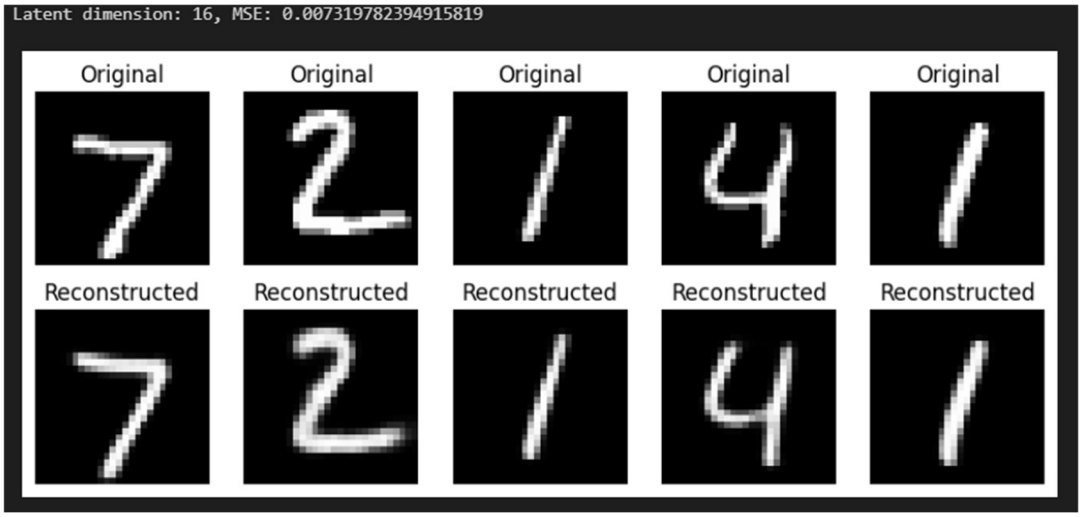
Latent Dim:4



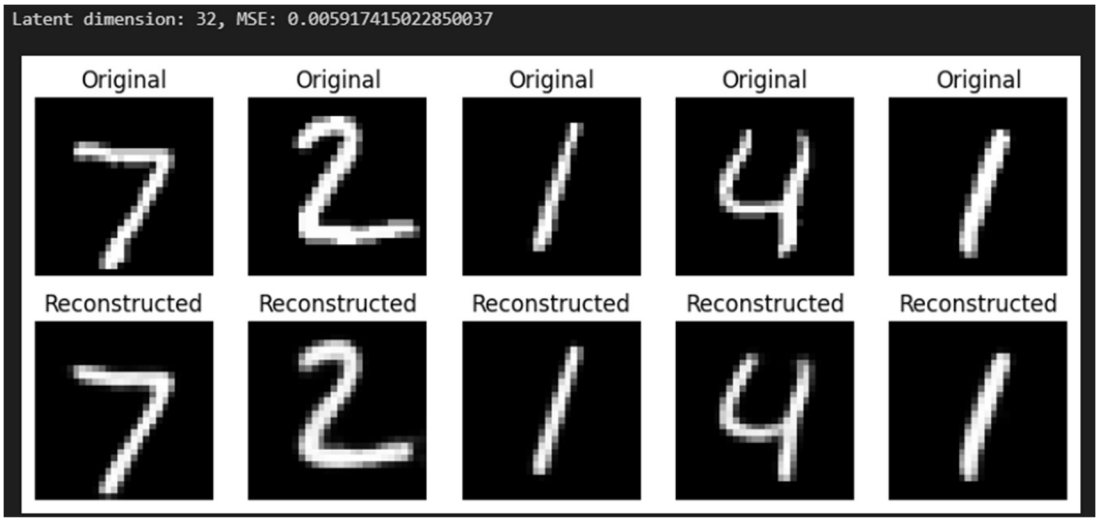
Latent Dim:8



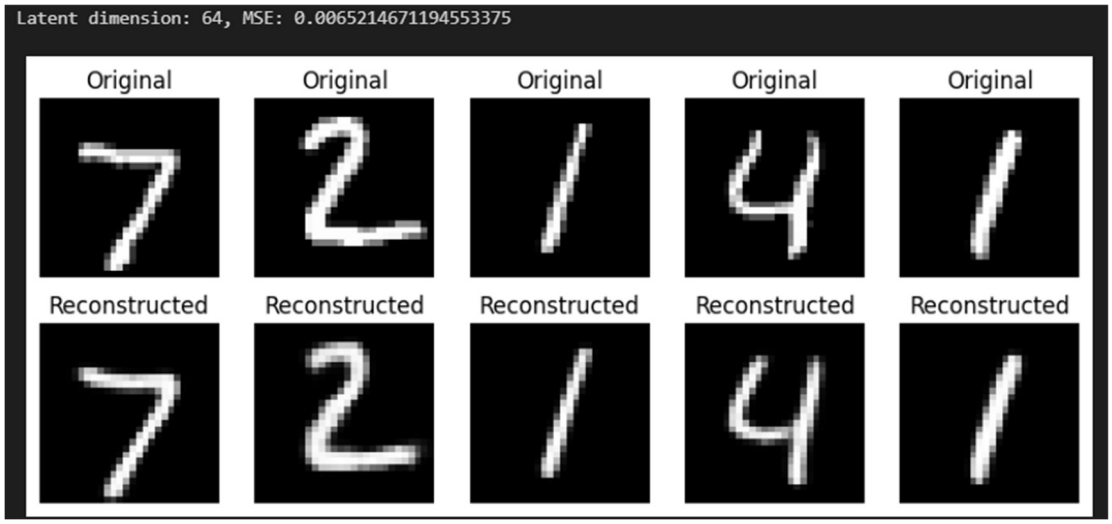
Latent Dim:16

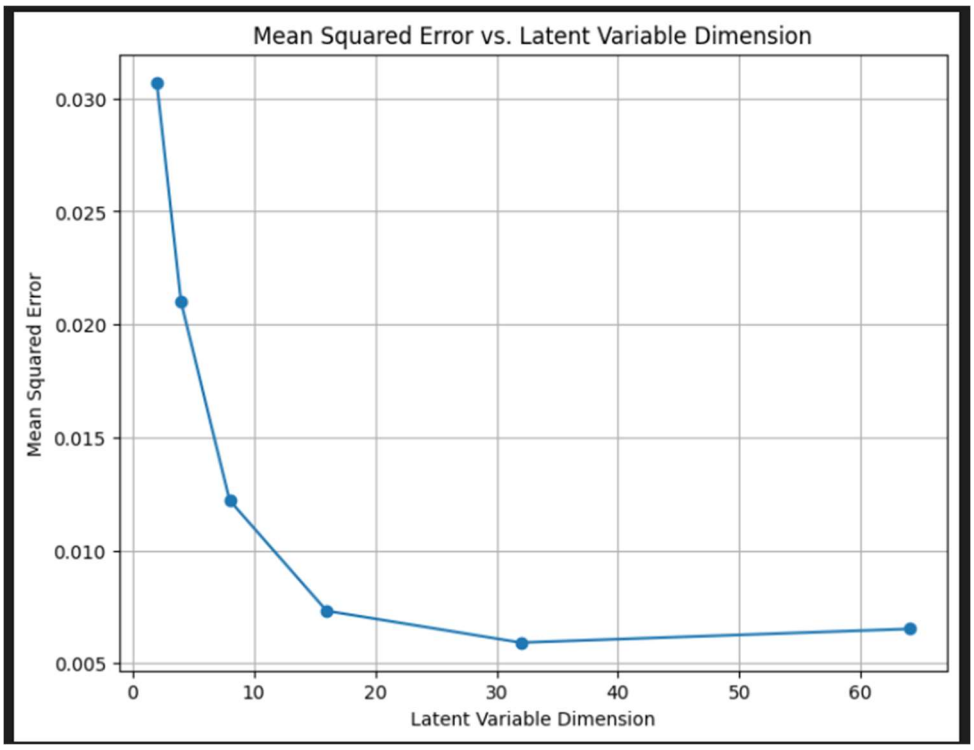


Latent Dim:32



Latent Dim:64

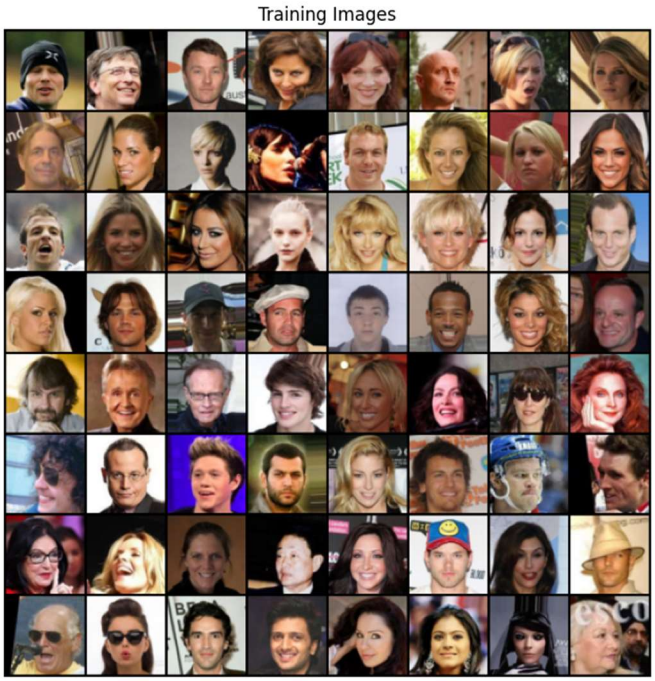




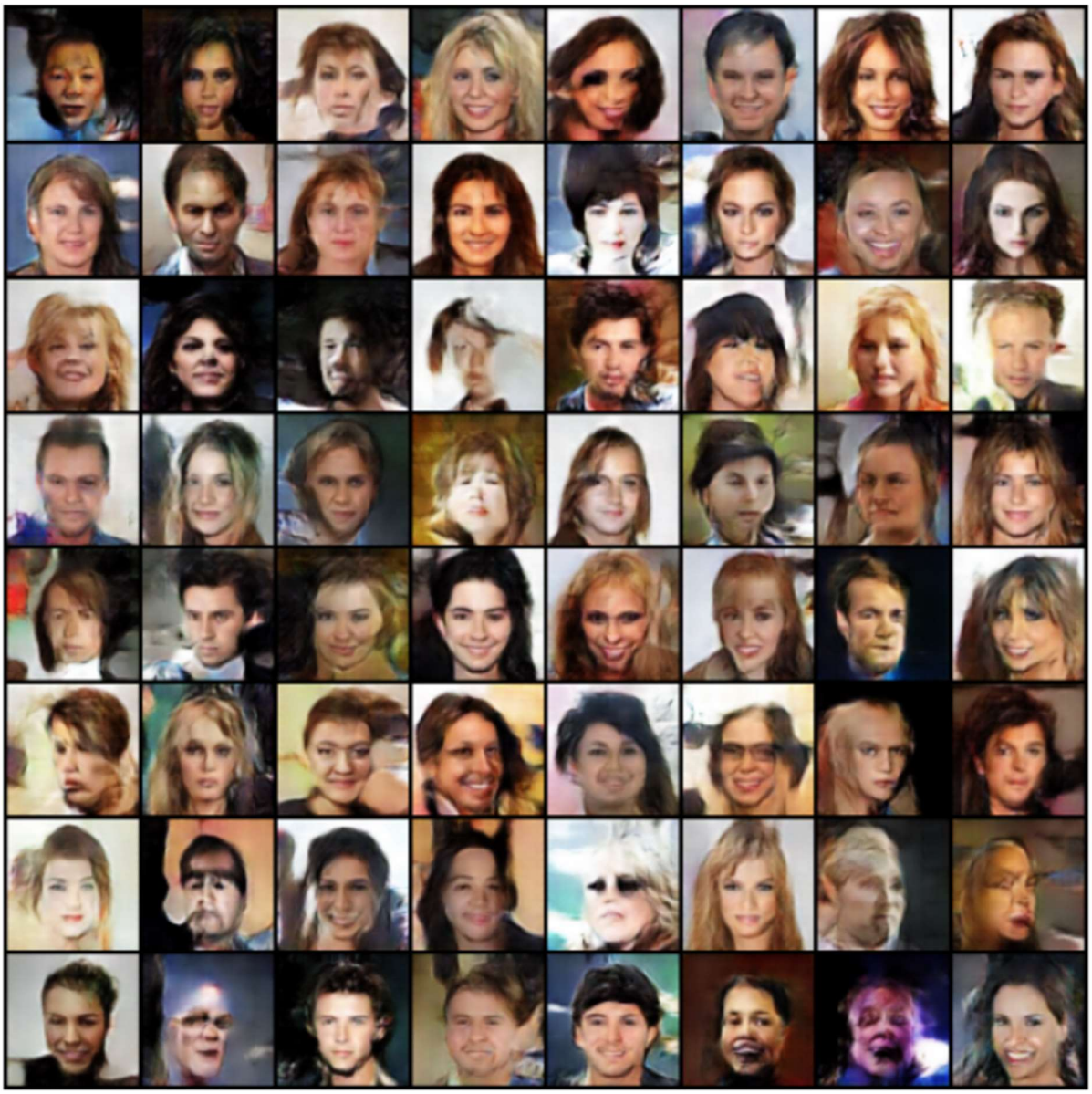
DCGan

DCGAN, or **Deep Convolutional GAN**, is a generative adversarial network architecture. It uses a couple of guidelines, in particular:

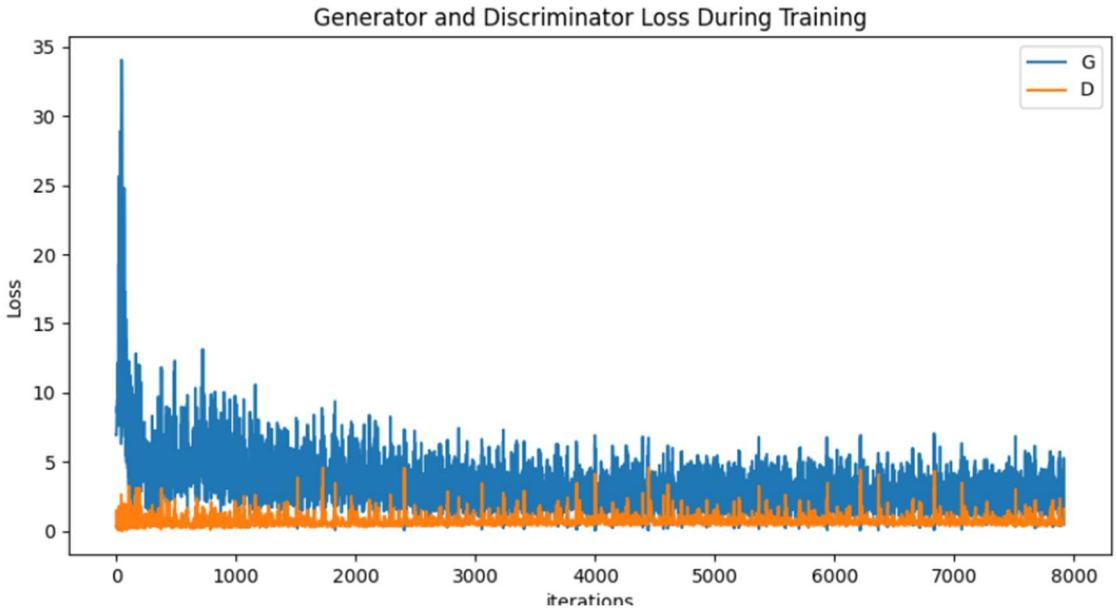
- Replacing any pooling layers with strided convolutions (discriminator) and fractional-strided convolutions (generator).
- Using batchnorm in both the generator and the discriminator.
- Removing fully connected hidden layers for deeper architectures.
- Using ReLU activation in generator for all layers except for the output, which uses tanh.Using LeakyReLU activation in the discriminator for all layer



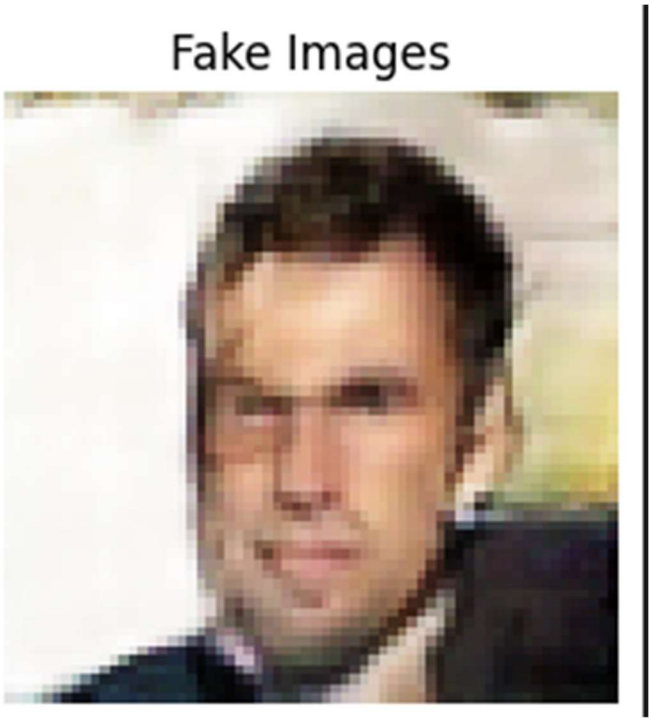
Generated Fake images.



Generator and Discriminator loss:

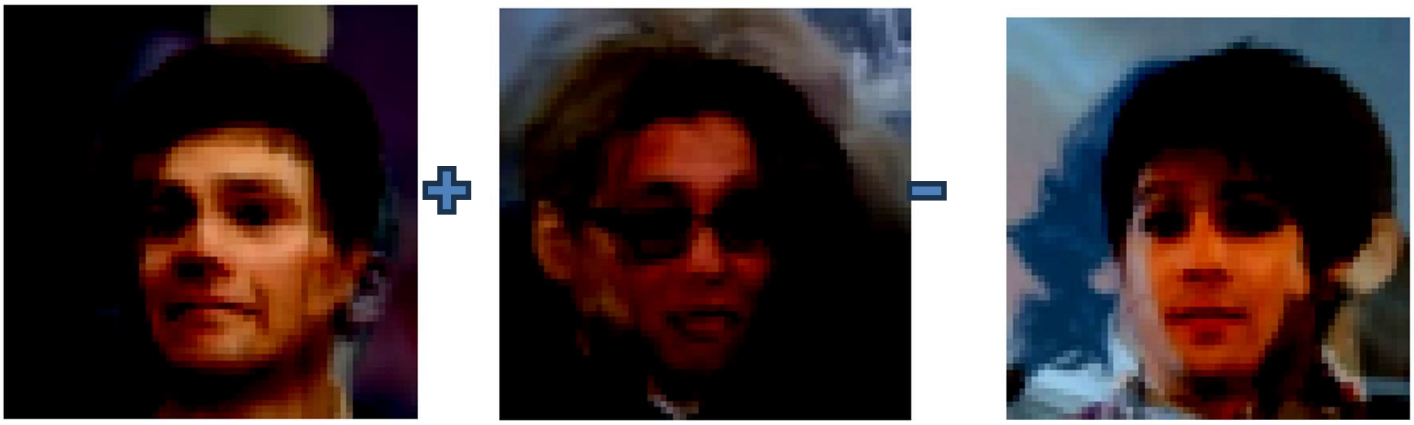


One fake image with random noise:

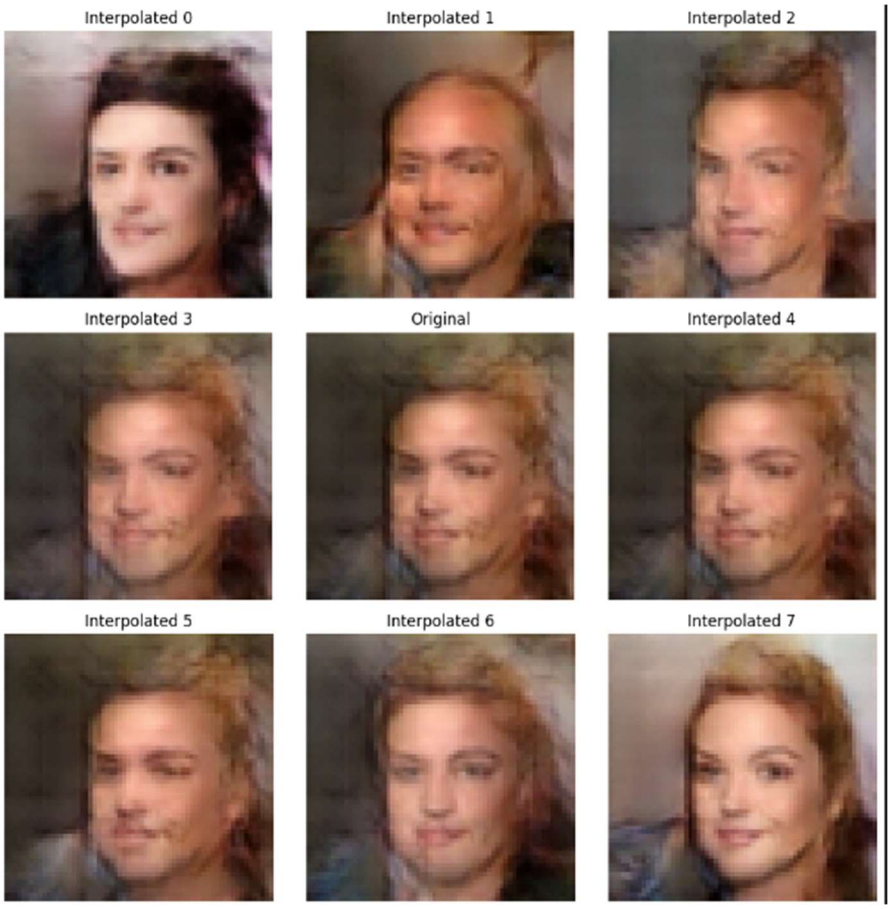


Vector arithmetic:

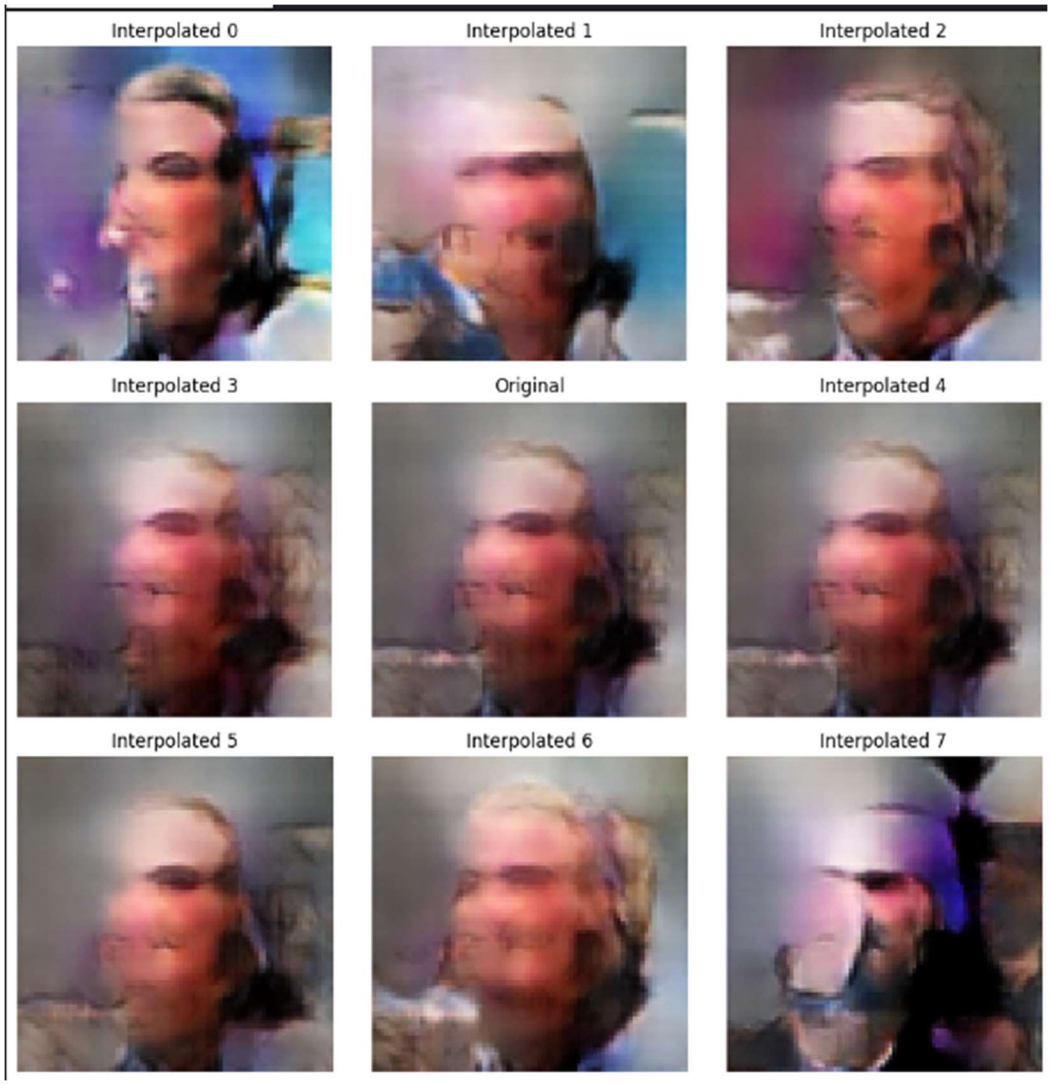
1. Men without glasses + People with glasses - People without glasses



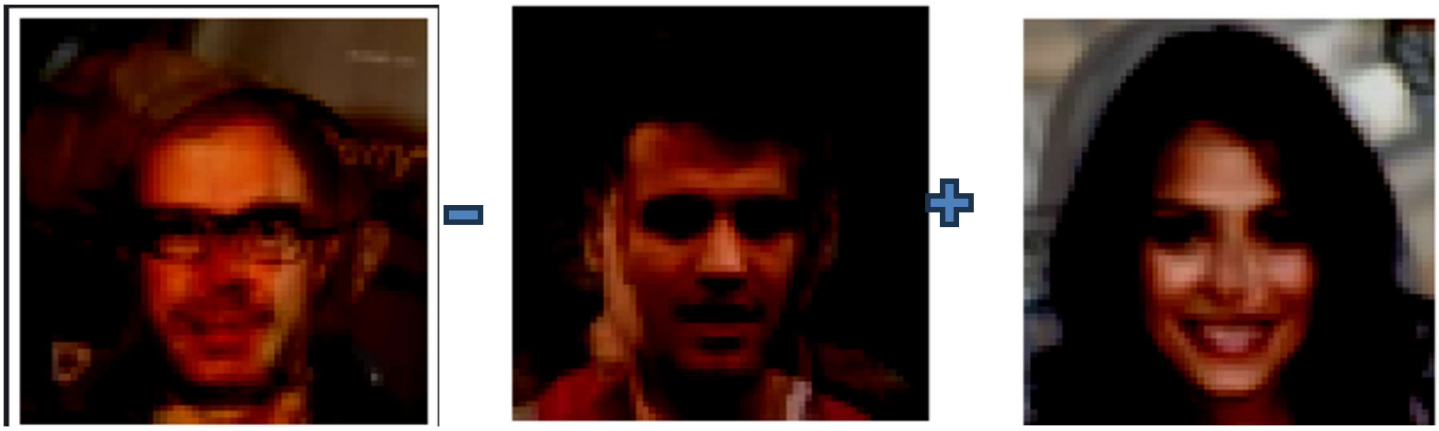
Final :



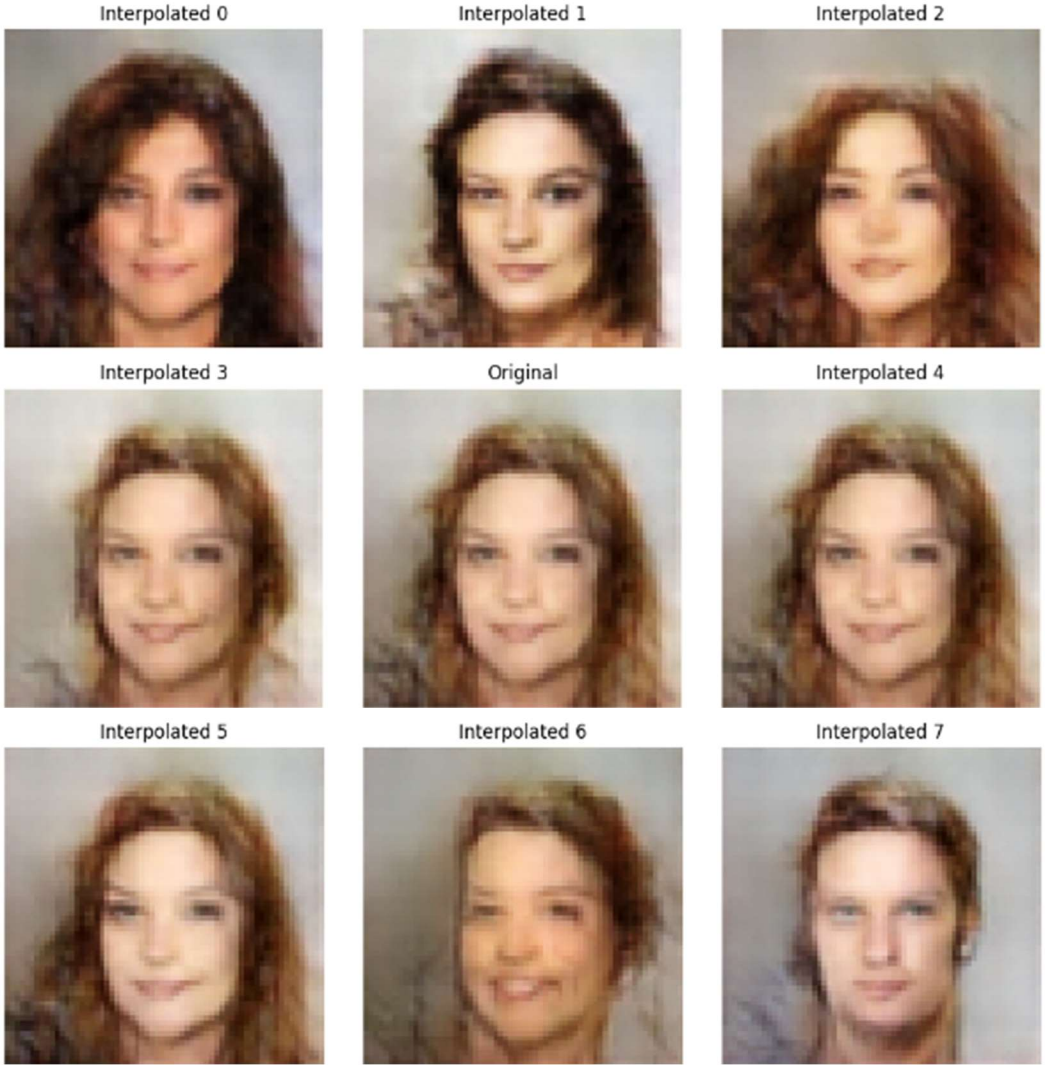
On input space:



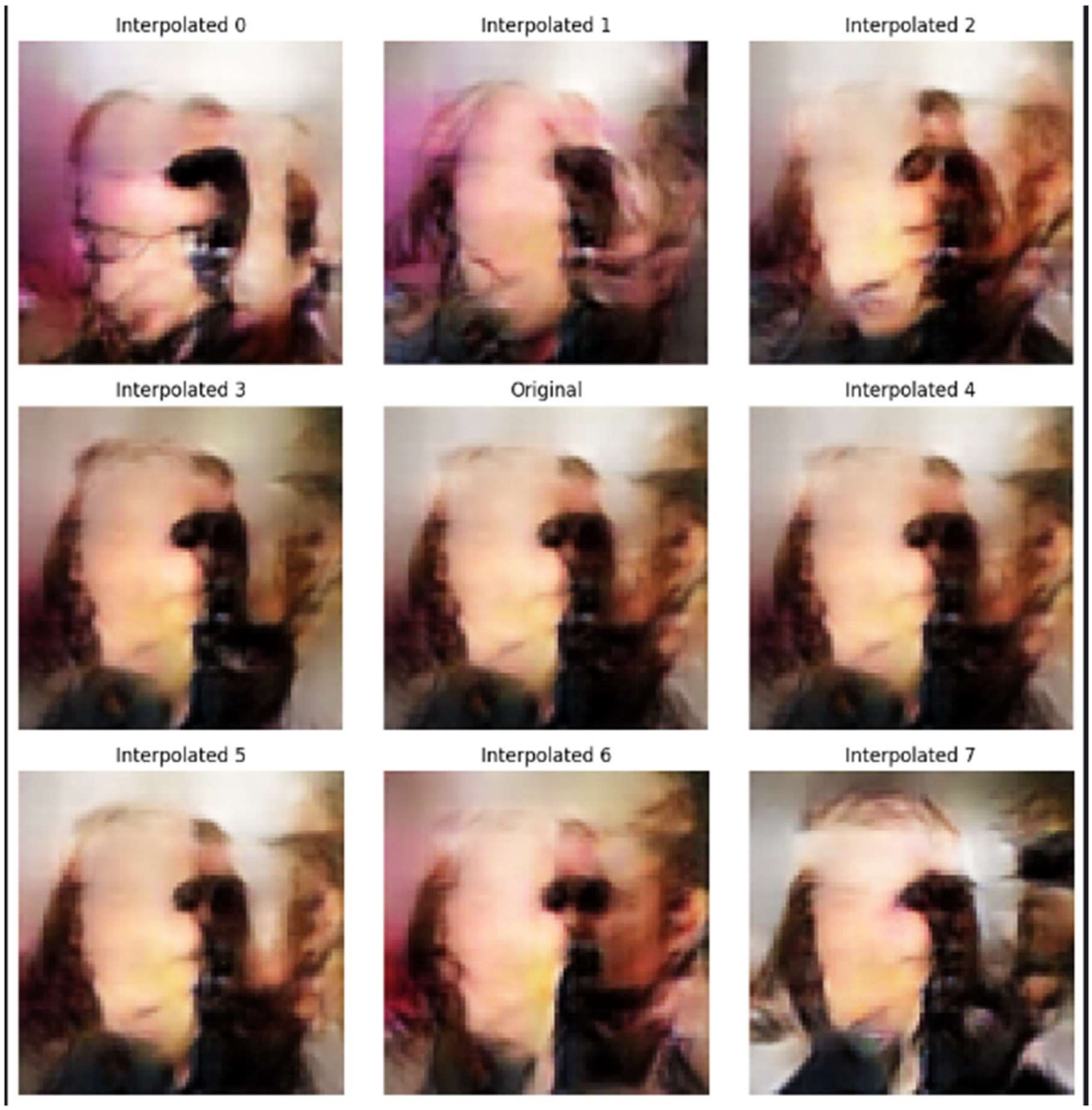
2. men with glasses - Men without glasses + Women without glasses



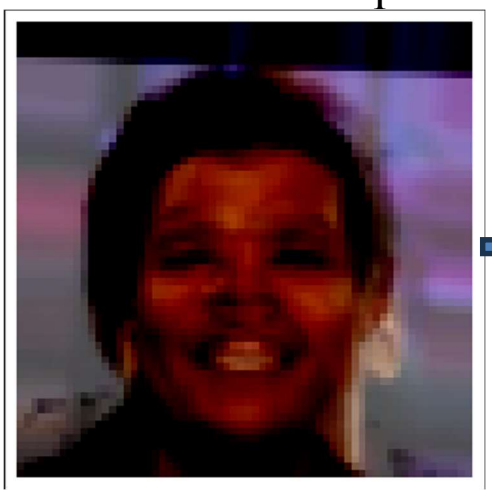
Final:



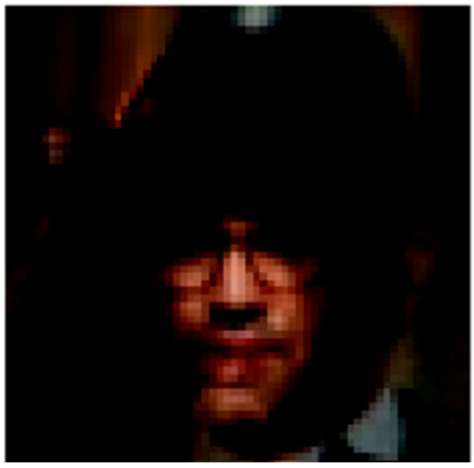
On input space:



3. Smiling Men + People with Hat - People with Hat + People with Mustache - People without Mustache



+



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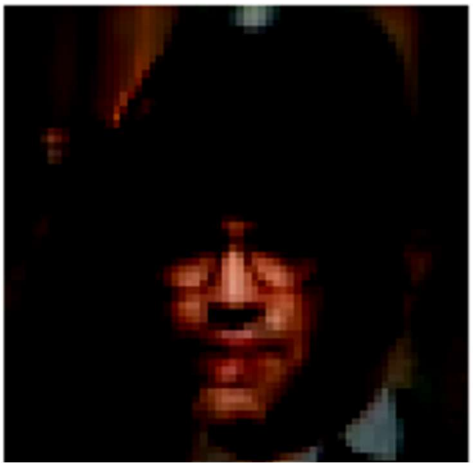
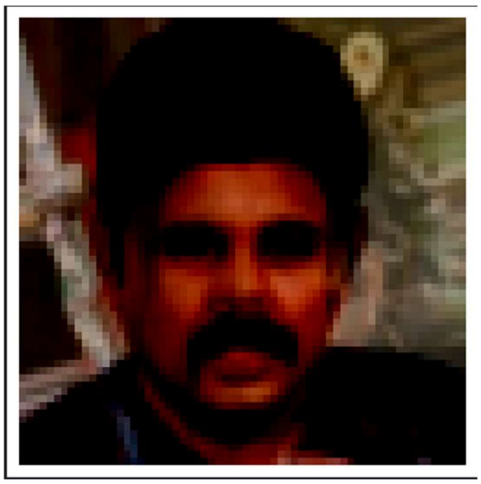
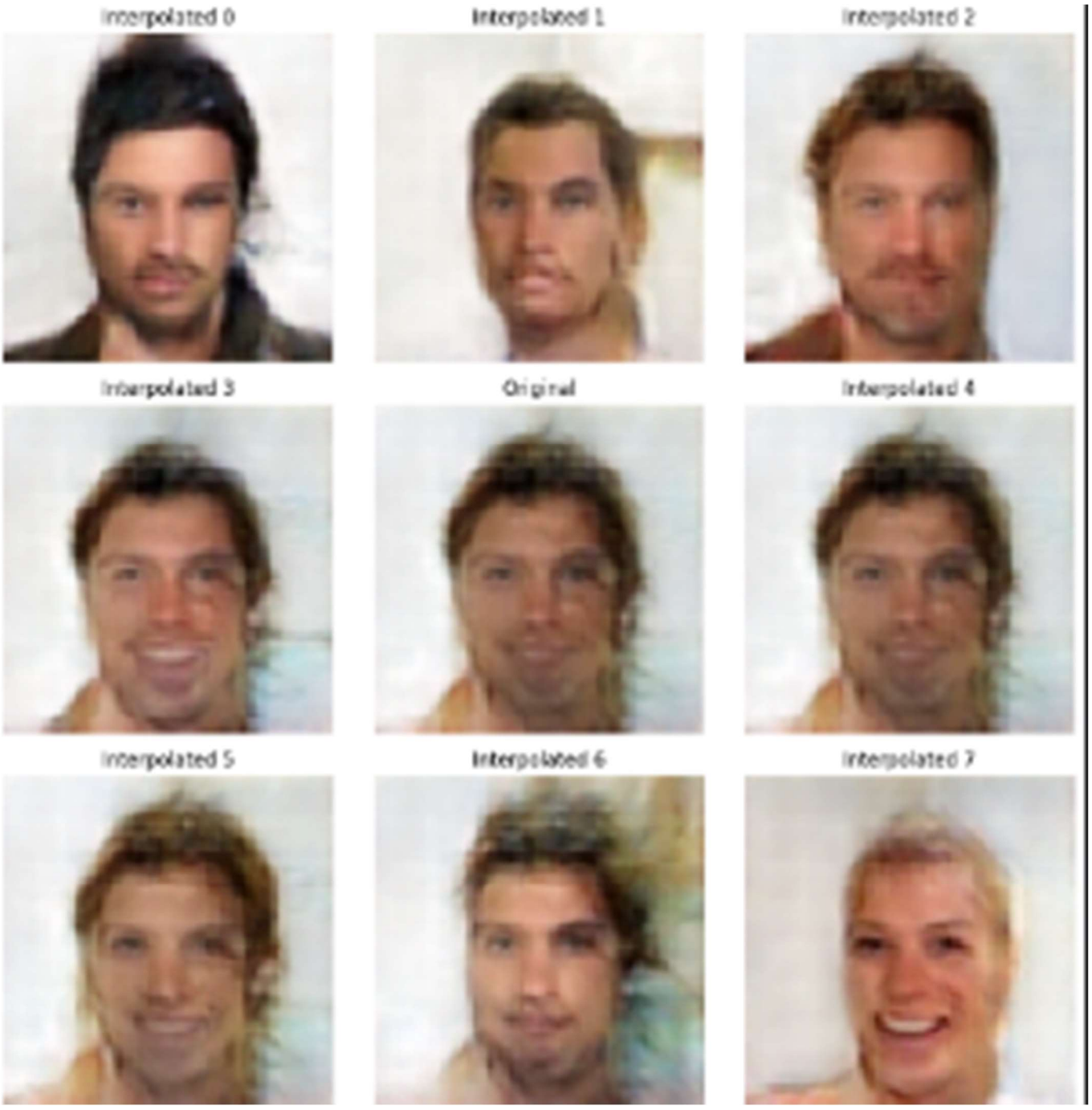


+



-

Final :


Interpolated 0
Interpolated 1
Interpolated 2
Interpolated 3
Original
Interpolated 4
Interpolated 5
Interpolated 6
Interpolated 7

On input space: