**CS398-Deep Learning**

**Homework 6**

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1. **Choose 5-6 pictures of generated images to show how training progresses**

Epoch 0

A picture containing text

Description automatically generated

A picture containing photo, indoor, different, many

Description automatically generatedEpoch 100

Epoch 200

A picture containing photo

Description automatically generated

Epoch 300

A picture containing photo, indoor, colorful

Description automatically generated

Epoch 400

A display in a store

Description automatically generated

A display in a store

Description automatically generatedEpoch 500

1. **A batch of real images, a batch of the gradients from an alternate class for these images, and the modified images the discriminator incorrectly classifies.**
   1. **A picture containing photo, different, wall, indoor

      Description automatically generatedA batch of real images:**
   2. **A batch of gradients from an alternate class for these images:**

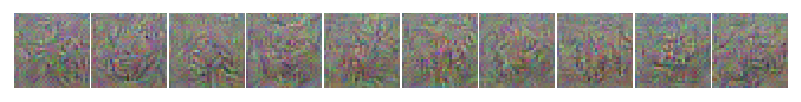
**A picture containing text

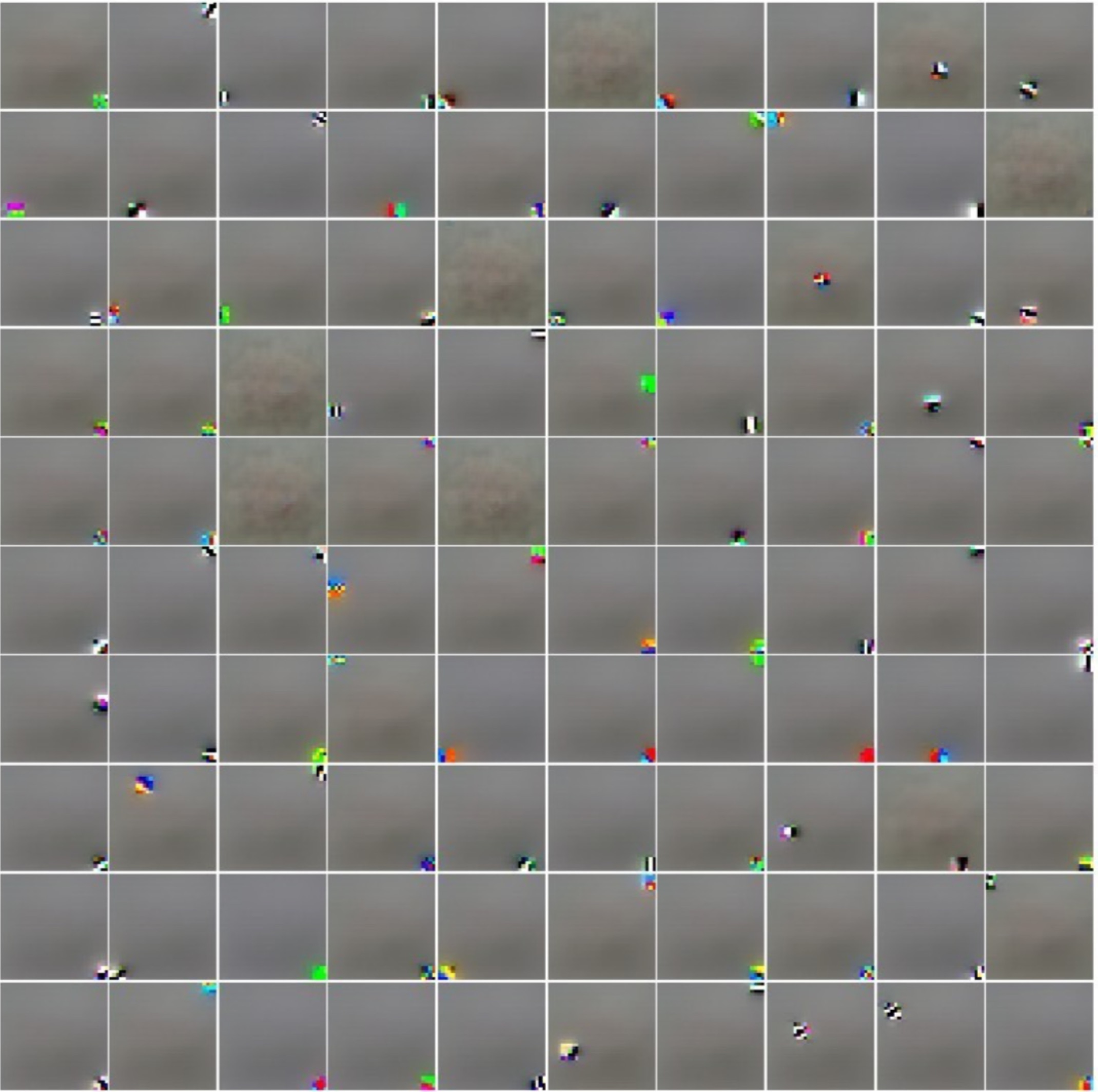
Description automatically generated**

* 1. **Modified images the discriminator incorrectly classifies:**

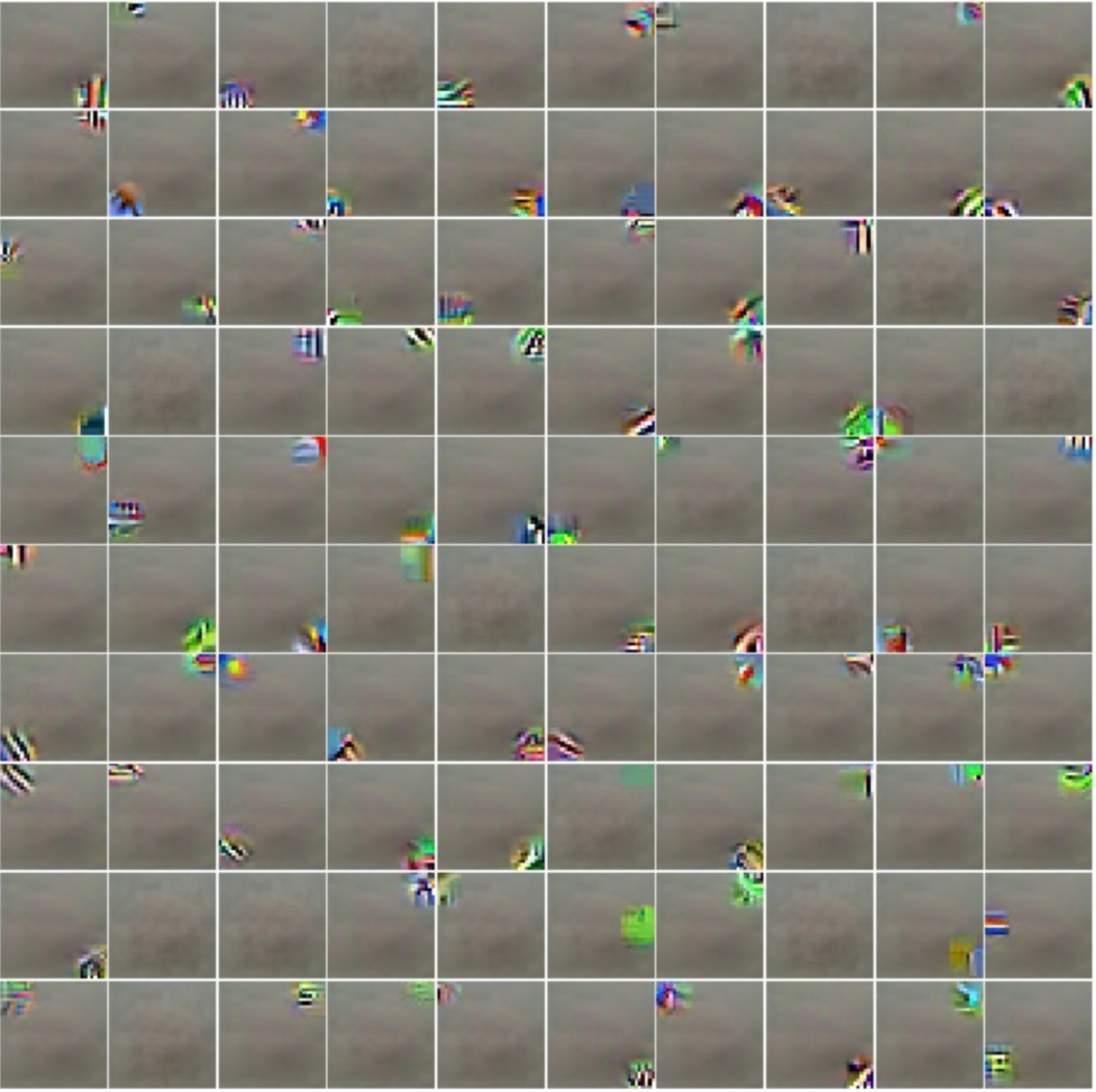
**A picture containing photo, different, wall, indoor

Description automatically generated**

1. **Structure of CNN (from lecture slides): images maximizing the class output. One for the discriminator trained without the generator and one for the discriminator trained with the generator.**
   1. **Discriminator trained without the generator**
   2. **Discriminator trained with the generator**
2. **Synthetic images maximizing a particular layer of features. Do this for at least two different layers.**
   1. **Discriminator trained with the generator**
      1. **Layer 2**

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* + 1. **Layer 4**

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* + 1. **Layer 8**

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* 1. **Discriminator trained without the generator**
     1. **Layer 2**
     2. **Layer 4**

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* + 1. **Layer 8**

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1. **Report your test accuracy for the two discriminators.**

**For the discriminator without generator, I got a test accuracy of 86.82%**

**For the discriminator with generator, I got a test accuracy of 83.76%**