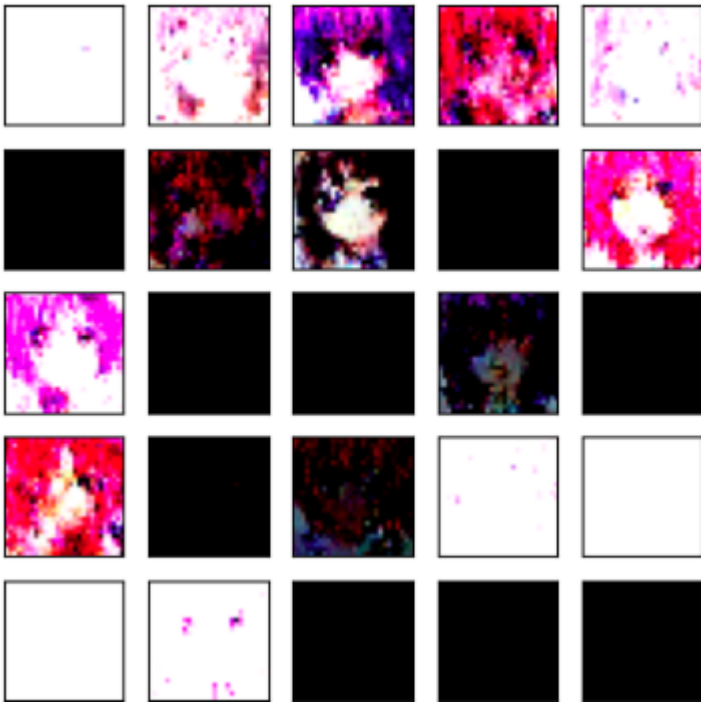
IMTVE HW2-2

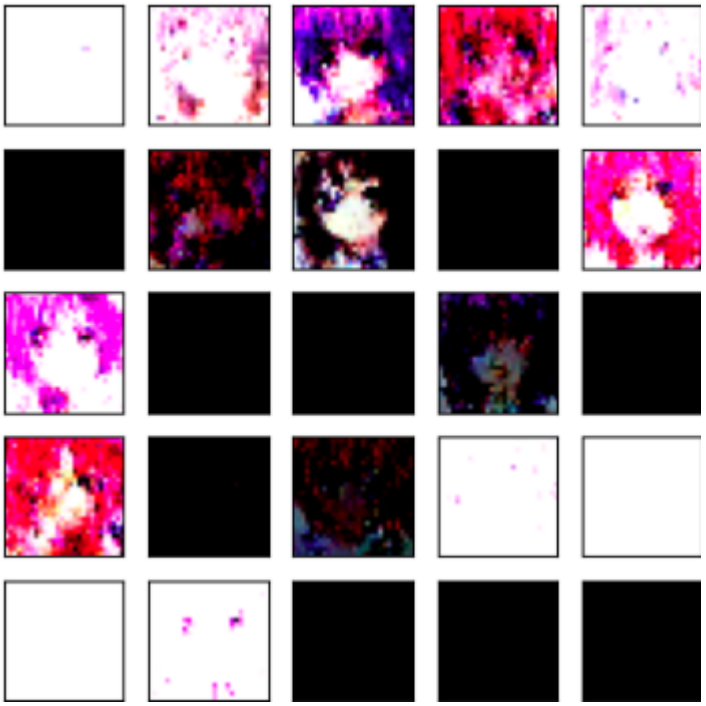
1. **Please provide a brief introduction about your experiments on the MNIST and Anime Face dataset, including details such as setting of hyperparameter, data augmentation techniques used, network structure, etc.**

   I have done the following experiment for Anime Face dataset.

   1. Train 3 channels simultaneously vs Train 3 channels separately
      The following are the qualitative results:
      - Train 3 channels simultaneously

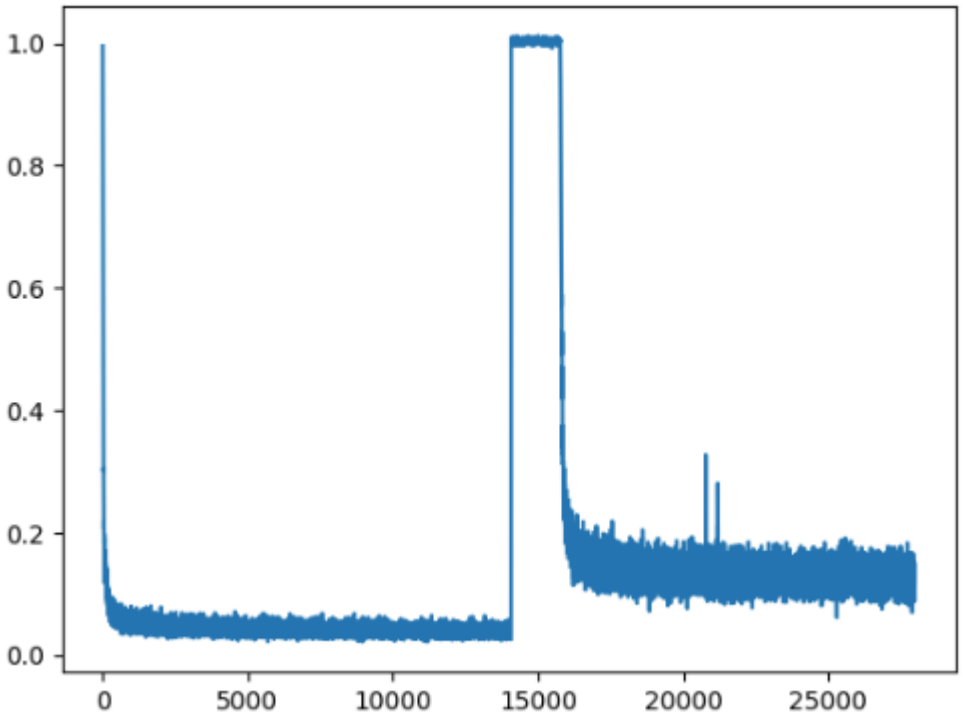
      - Train 3 channels separately



Some generated images exhibit excellent contours, while others have identical RGB channel values. And, we get the similar result if we train 3 channels separately.

2. Change the number of epochs to train

   We can find out after around 30 epochs. The model would be overfitting.



2. **Comparing the generation quality between DCGAN and DDPM: Compare the resolution, level of detail, and diversity of**

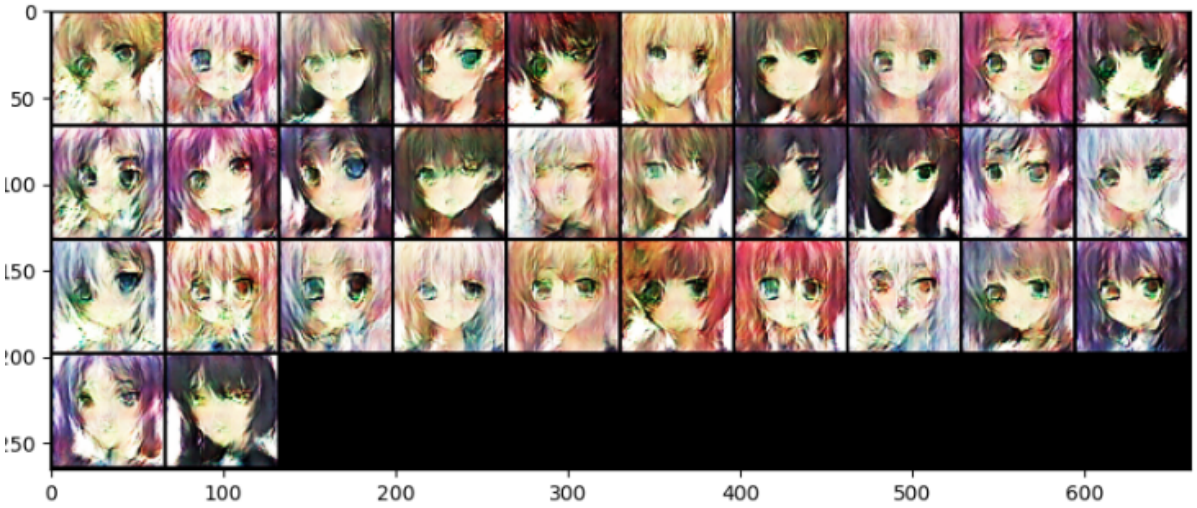
generated images. You can assess them using metrics such as FID, IS, or subjective evaluations. Encourage writing more about the experiment you want to discuss.

I compare the performance of DCGAN and DDPM with FID, IS, and subjective evaluation.

	FID	IS
DCGAN	0.14	1.7853541851043701
DDPM	0.28	1.9853541851043701

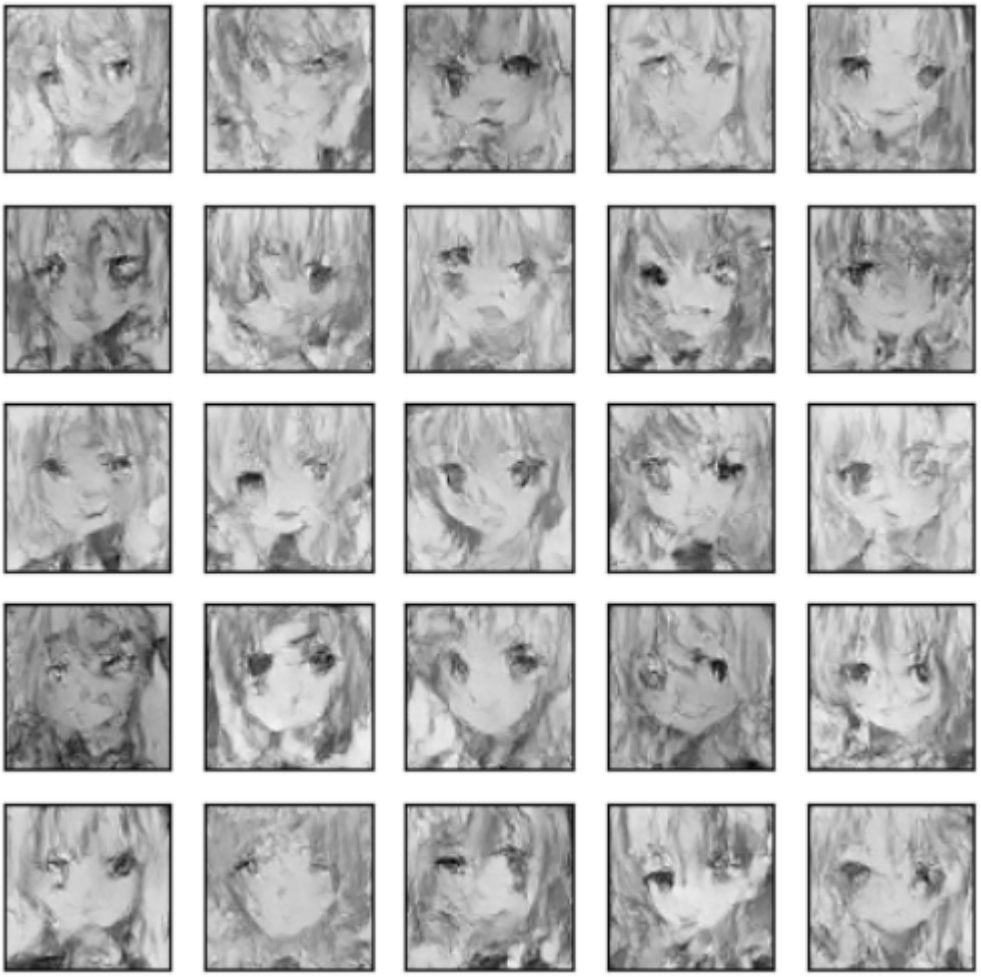
The following are subjective evaluations.

- DCGAN:



We observe that the results generated by the DCGAN lack fine details, with some images exhibiting blending of contours in areas such as eyes, nose, and mouth. Additionally, inconsistencies arise in the generated photos, such as asymmetrical eye colors and non-uniform distribution of colors in features like hair, contributing to irregular color patterns.

- DDPM:



We can observe that the results obtained from the training also lack fine details. While the shapes of many characters are discernible, the intricate contours appear blended together.

- Conclusion:
  In the final results, I find that the outcomes obtained from DCGAN appear to be better, exhibiting superior handling of details compared to DDPM.