1   Image Synthesis with Diffusion Model

Please follow the instructions in this notebook. You will implement a text-conditioned denoising unet and the sampling algorithm. Then you'll see the diffusion process on a single image and try to train your own diffusion mode. Once you finished with the notebook,

- download submission.zip and submit it to Gradescope.

- Answer the following questions in your submission of the written assignment:

(a) Why might a U-Net be a good choice for the model backbone? List two reasons.

(b) Screenshot your visualization for sampling the noisy image and include it in your submission of the written assignment. And describe the picture you observed briefly. What kind of process is this?

(c) Screenshot one of your visualization about the sampled images and include it in your submission of the written assignment. Then answer the following question. How does the model perform and does it meet your expectations? If not, what do you think are the directions for improvement?