Homework 2

In this homework, we learn how to use variational autoencoder (VAE) to generate medical images. You are encouraged to implement VAE from scratch by yourself, to learn how to implement a deep generative model. However, if you already know how to implement VAE or would like to save some time to focus more on your course project, it is also OK to use an existing implementation from GitHub.

After that, you can take the chest X-ray dataset from https://www.kaggle.com/paultimothymooney/chest-xray-pneumonia and train a VAE model on the chest X-ray dataset. Use the trained VAE to generate chest X-ray images, and write a report (2 pages, NeurIPS format). In the report, you can include the following: 1) hyperparameter settings; 2) training loss curves; 3) Inception score and FID score of generated images, using code from https://pytorch-ignite.ai/blog/gan-evaluation-with-fid-and-is/ 4) examples of generated Images. Please submit the report to Gradescope.