Programming Assignment 1
Due date: Dec. 1st

- You will implement the NICE flow model "NICE: Non-linear Independent Components Estimation". The model comprises of 4 additive coupling layers, splitting between odd and even dimensions and alternating which one is fixed. In the end there is a scaling layer that learns a scale parameter s per dimension and scales by exp(s) (I added a small epsilon for stability).

- The paper uses logistic distribution for the latent space.

- Implement and run on MNIST and Fashion-MNIST for 50 epochs (results should be worse than numbers reported in the paper)

- We use dequantization: Images are discrete objects in $\{0, ..., 255\}^D$ while our model is continuous. We turn the discrete distribution into continuous by adding uniform(0,1) random noise. We then rescale to $[0, 1]$ range. *Note that this rescaling needs to be accounted for in the log-determinant of the Jacobian (implemented in the code).*

- For more information on dequantization see A note on the evaluation of generative models sec. 3.1

- You are given a template code that you need to fill in with the missing pieces. You need to submit the filled-in code and pdf with the results.

- Implement affine coupling and run the same model with affine instead of additive.

- Besides the code you need to submit a pdf that contains the following: Plots with train and test log-likelihood for each epoch for both datasets with affine and additive coupling. In addition submit the sampled images from your model at the end of training.