CSC321: Assignment #4

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Problem 1

1. **Implement the Discriminator of the DCGAN**

   (a) Let P = number of padding, W = input width, K = kernel size, S = stride, O = output width

   According to the structure of the convolutional network,

   $$O = \frac{W}{2}$$

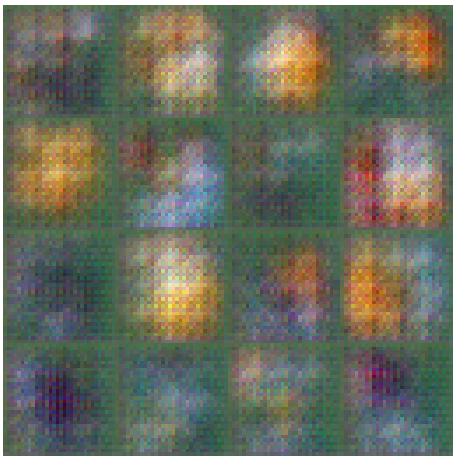
   Using the formula for calculating output dimension

   $$\begin{aligned} O &= \frac{W - K + 2P}{S} \\ P &= \frac{S(\frac{W}{2} - 1) + K - W}{2} \\ &= \frac{2(\frac{W}{2} - 1) + 4 - W}{2} \\ &= \frac{W - 2 + 4 - W}{2} \\ &= 1 \end{aligned}$$

   (b) See implementation in models.py

2. **Generator**
   See implementation in models.py

3. **Experiment**
   sample from iteration 200 and 5000 are shown in Fig1. The sample improves in their resolution and quality. We can clearly see what each emoji is (human figure or objects) after a very long period of iterations.



(a) Sample from iteration 200

(b) Sample from iteration 5000

Figure 1

Problem 2

1. **Generator**
   See implementation in model.py
2. **CycleGAN Training Loop**
   See implementation in cycle_gan.py
3. **CycleGAN Experiments**

   (a)

   (b)

   (c)

   (d)

   (e)