Why do they normalize the images from [-1,1]?

The images are normalized from [-1, 1] to make the training process more efficient and in a certain range.

What is the meaning of the BUFFER\_SIZE and BATCH\_SIZE variables?

BUFFER\_SIZE is the size of the buffer that the elements will be shuffled around to avoid overfitting the models. Randomly moving the data around prevents the model from learning through the data’s order and increases generalizability. BATCH\_SIZE is the number of images that will be processed in an epoch.

Do some research on the layers of the generator model. Explain how it starts with the noise input and gets a final output shape of (28,28,1). Explain the purpose of the LeakyReLU layers and the BatchNormalization layers. Explain the purpose of the stride parameter.

With Conv2DTranspose layers, a seed value input is used to create an image that is initially random noise. This seed is given into a Dense layer and upsampled to reach an image size of 28 x 28 x 1. The LeakyReLU layers are used to transform the output into the desired range and also provide output for negative values. The BatchNormalization layers normalize the output to have a mean close to 0 and a standard deviation close to 1. The stride parameter is used to determine how the filter moves and shifts across the input.

Explain the use of the dropout layer in the discriminator model. Explain how the discriminator model layers start with the image and narrow it down into a fake or not fake label.

The dropout layer in the discriminatory model is to help reduce the overfitting of the model, which reduces its effectiveness on new data. This works by removing different nodes from the neural network temporarily during calculations. The discriminator model layers look at the image broadly, then closer and closer until it provides an output signifying if the image looks real or fake.

Explain the binary cross-entropy loss in simple terms.

The binary cross-entropy loss is low if the model closely predicts the truth, but high if the predictions are largely inaccurate.

The train\_step is probably the most important part to understanding GANs as a whole. Explain how the loss is calculated, how that plays into the gradient descent optimization, and thus how the discriminator and generator improve over each epoch.

The loss is calculated based on how accurate the model is: how well the discriminator can distinguish images, and how well the generator can fake images. The gradient descent uses these values to improve model performance and make optimizations. Each epoch, the generator makes images that are harder to verify and the discriminator gets better at discerning the images.

Now, in your own words, give a few sentence description of what GANs are overall, based on your understanding of this tutorial.

GANs leverage the power of neural networks against each other to create models that successfully create similar data to pre-existing datasets. GANs can be useful for projects where there is limited testing data and more information is needed to train certain machines.