GAN Assignment

By,
Ramshankar

Taking CIFAR 10 Dataset

The CIFAR-10 dataset consists of 60000 32x32 colour images in 10 classes, with 6000 images per class. There are 50000 training images and 10000 test images.

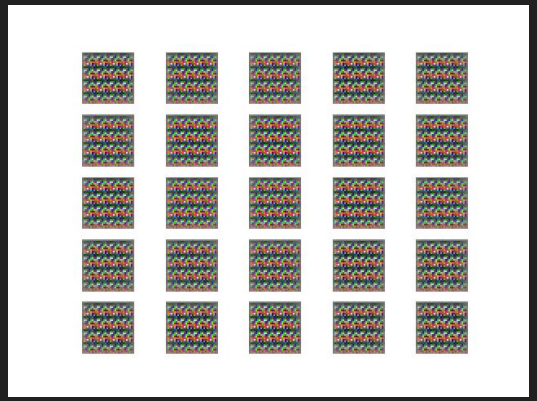
The dataset is divided into five training batches and one test batch, each with 10000 images. The test batch contains exactly 1000 randomly-selected images from each class.

Using convolution layers in the GAN

- In the generator, I use transposed convolutional layers (also known as deconvolutional layers) to upsample the input noise vector into an image
- For the discriminator, I employ standard convolutional layers to downsample the input image and extract features.
- Include batch normalization layers after each convolutional layer in both networks, and use leaky ReLU activations for all layers except the final output layer of each network

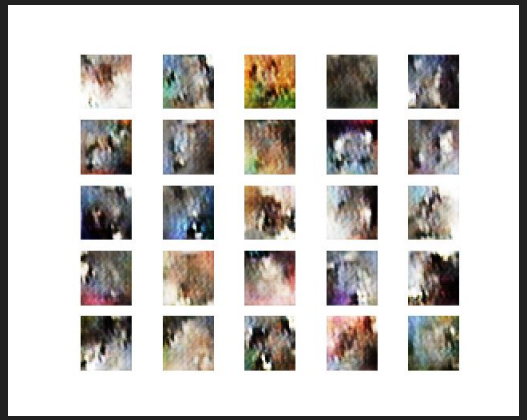
Architecture

- Generator: Starts with a noise vector and uses transposed convolutions to upsample it into an image.
- Discriminator: Uses standard convolutions to downsample the input image and extract features.
- Both networks use batch normalization after each convolutional layer to stabilize training.
- Leaky ReLU activations are used throughout both networks, except for the final output layers.
- Generator's final layer uses tanh activation to produce an image with pixel values in [-1, 1] range.
- Discriminator's final layer uses sigmoid activation to output a probability of the input being real.

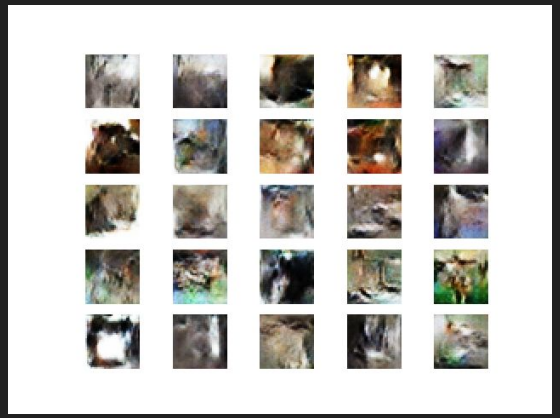


epoch-0

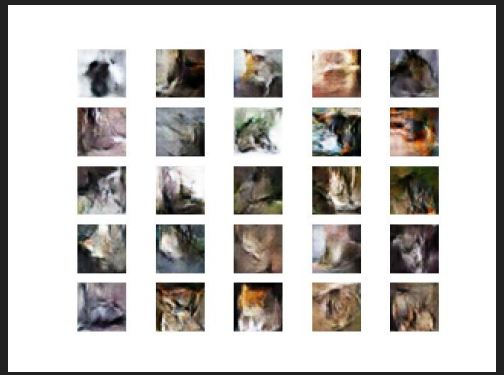
epoch-200



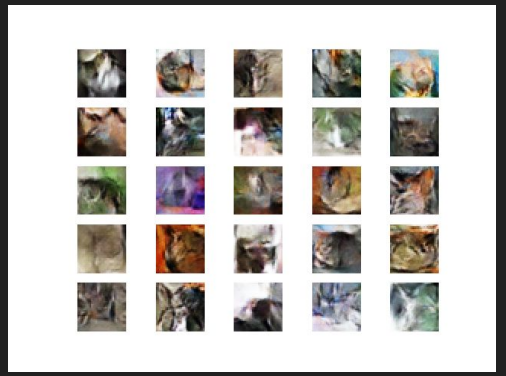
epoch-400



epoch-600

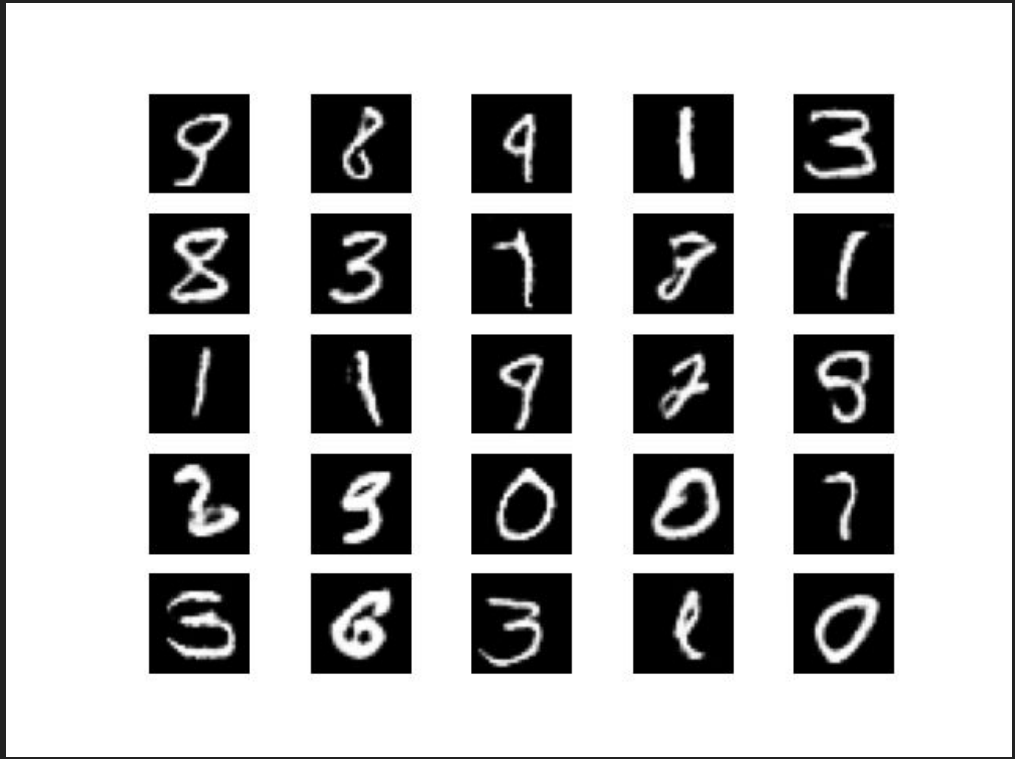


epoch-800



epoch-1000

Bonus: I also tried for MNIST for 200 epochs



Thank you