Sketch RNN (Ha and Eck, 2017)

What is it?

Sketch-rnn is a neural network model capable of generating sketch drawings of common objects, like cats, giraffes, and coffee tables. Additionally, *sketch-rnn* can encode entire sketches into a single vector representation (and subsequently decode such vectors into sketches again), making it possible to perform **latent vector math** on these sketches.

Why should I care?

Latent vector math lets us generate interesting sketches that are combinations // extrapolations of already existing sketches, like this:

In the image above, the only drawings created by humans are the ones on the top row (tagged as "Human Input". The sketches in between are generated by encoding the

How do they do it?

This model is a hybrid between two popular deep learning models: variational autoencoders (VAEs), and sequence to sequence models. The sequence-to-sequence model is used to encode and reconstruct the sketch, since each sketch is represented as a sequence of points on an XY grid (think of you drawing as you moving a pen through a 2D space, leaving a sequence of points behind). The VAE part of this model lets us encode sketches into a single vector, and decode that single vector back into a sketch. This encoding-decoding scheme lets us do the cool latent space interpolation shown above!