**Day 29**

**What to do?**

Learn about Autoencoders.

**Auto encoders:**

An autoencoder is like PCA, but for neural networks. It takes the input and compresses the input values and uses those compressed values to reconstruct the input. So, when input x is sent to a hidden layer h (h = f(x)), it is reconstructed as r = g(h). There are two scenarios in which autoencoders can be used in.

1. When r is close to x, or
2. When output looks like input

As PCA works, autoencoders makes sure that only the important neurons are utilized, without using all the neurons. When autoencoders are written, the goal for any hidden layer h is to take only the useful and important properties from the input (compressed). The shrinking of the hidden layer h is called “undercomplete encoder”. From the compressed layer, the next layers are reconstructed.

This process consists of four things:

1. Input
2. Encoding function (that compresses the layer)
3. Decoding function (that reconstructs the network)
4. Loss function (good if the output is close to the input, bad if output not close to the input)