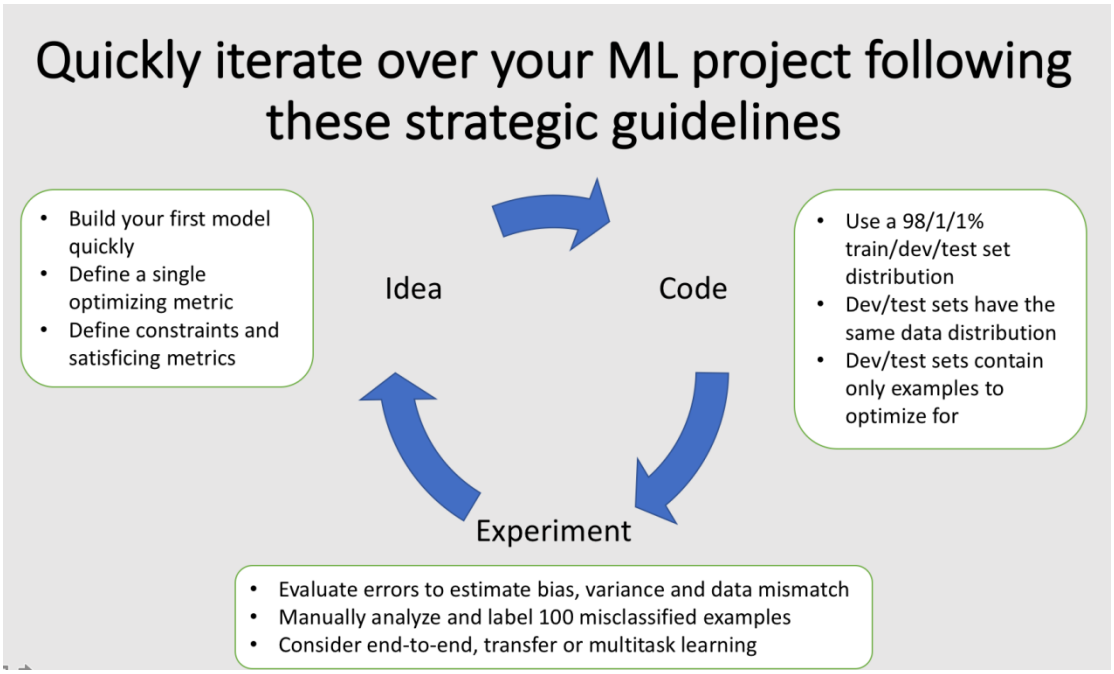
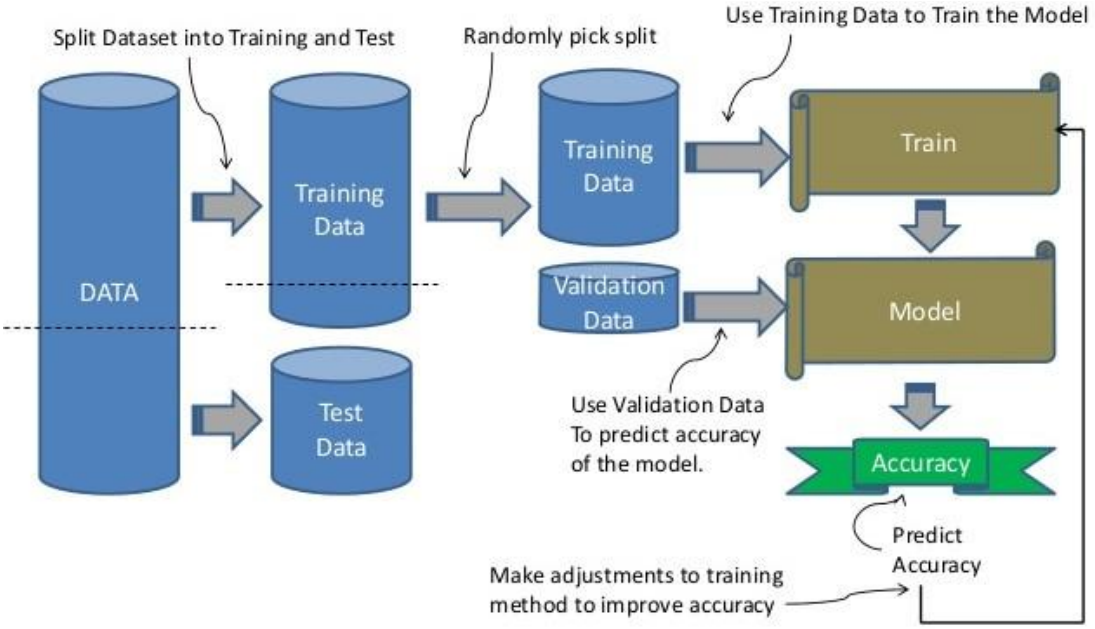
Week 3

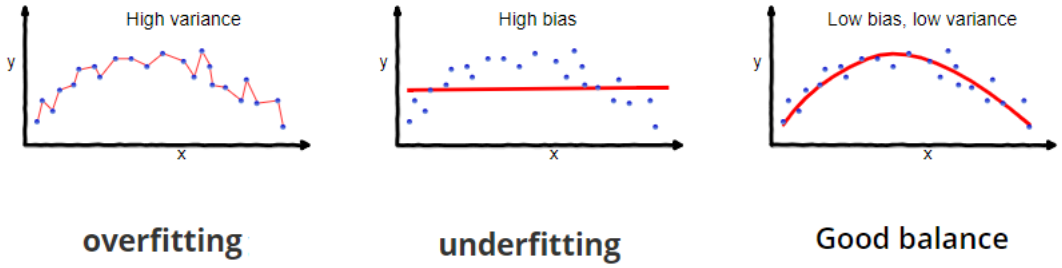
In neural network



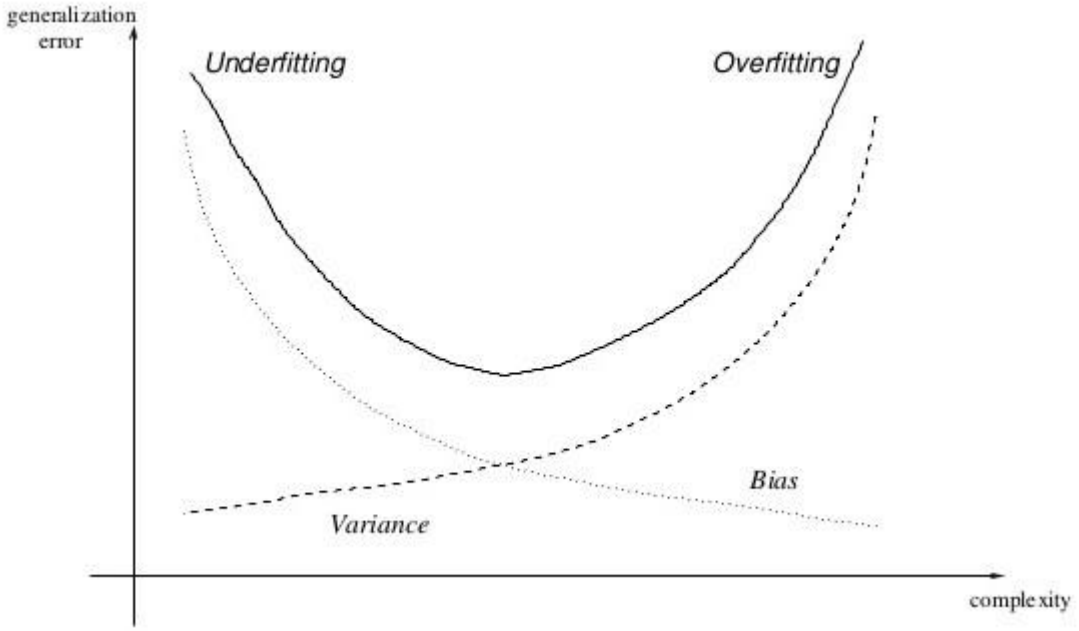
So we repeat the process until converge to desired accuracy



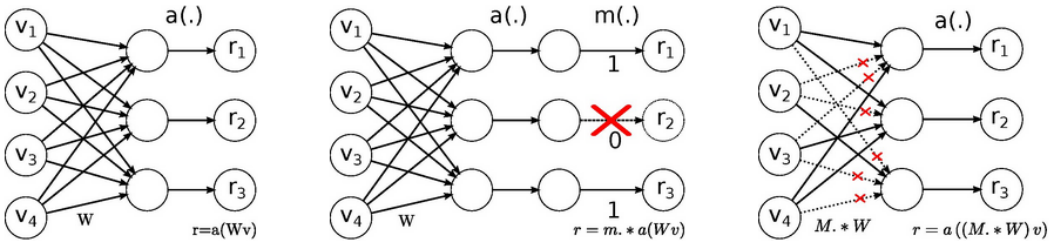
So we use the bias and variance as an indication of we have under fitting (high bias) or over fitting (high variance) or just right



Bias and variance trade off



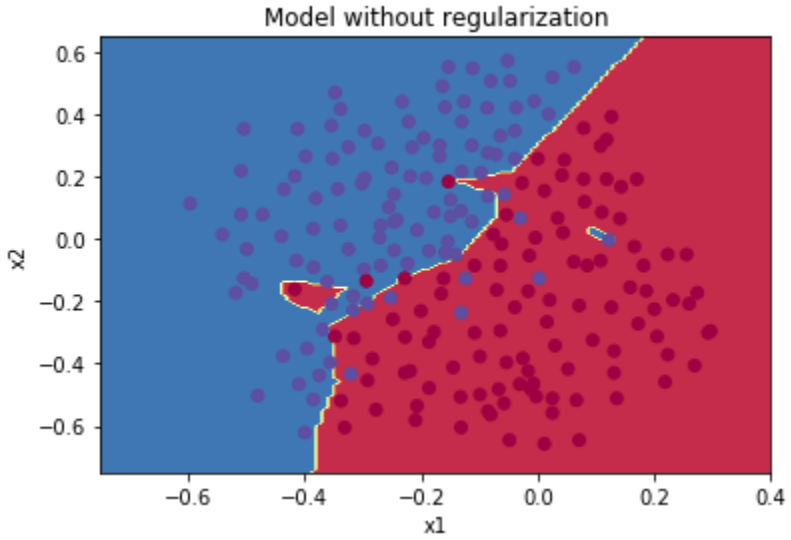
And then we try to improve the neural network with L2 regularizing and with using drop out regularization



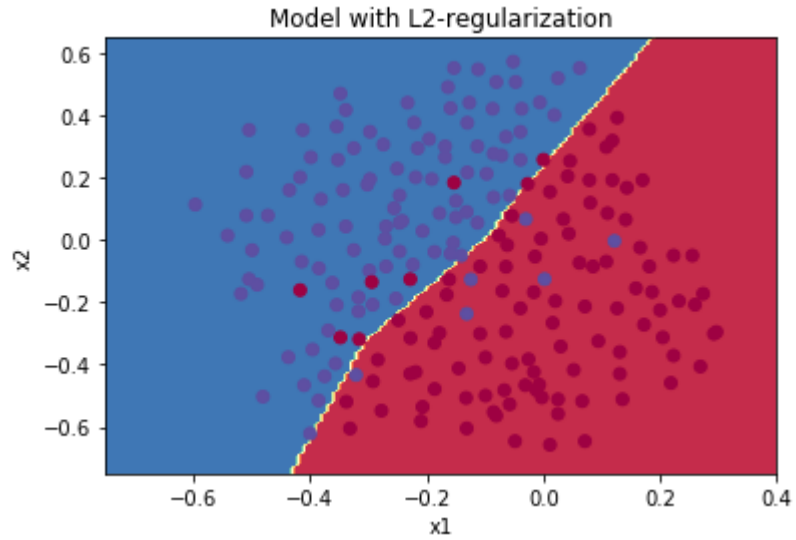
No-Drop Network DropOut Network DropConnect Network

And as shown in the second assignment

When we use non regularization model we have the train accuracy is 94.8% while the test accuracy is 91.5% and the model is as shown



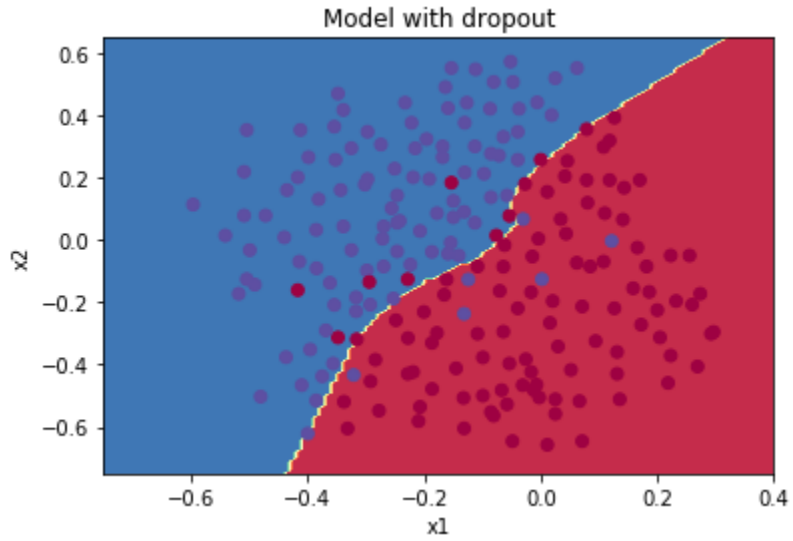
But when we use L2 regularization model the test set accuracy increased to 93% and the model is as shown



Finally, dropout is a widely used regularization technique that is specific to deep learning. It randomly shuts down some neurons in each iteration

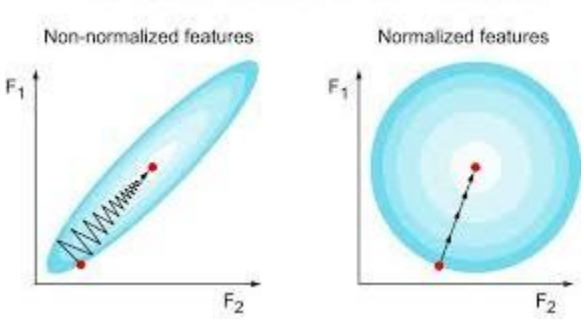
When you shut some neurons down, you actually modify your model. The idea behind drop-out is that at each iteration, you train a different model that uses only a subset of your neurons. With dropout, your neurons thus become less sensitive to the activation of one other specific neuron, because that other neuron might be shut down at any time

And the test accuracy has increased again (to 95%)! Your model is not over fitting the training set and does a great job on the test set and the model is as shown



As shown regularization hurts training set performance! This is because it limits the ability of the network to over fit to the training set. But since it ultimately gives better test accuracy, it is helping your system , Regularization will help you reduce overfitting and drive your weights to lower values but L2 regularization and Dropout are two very effective regularization techniques

Normalizing training sets is also used to improve the neural net work because as shown gradient decent will be



And we will make the gradient checking