PadhAI: Batch Normalization and Dropout

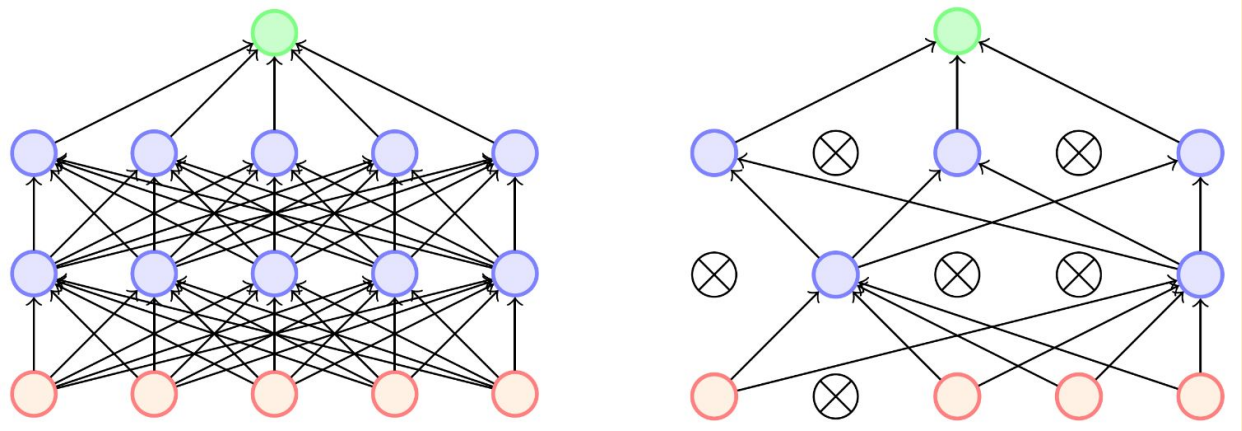
One Fourth Labs

The idea of dropout

Can we create multiple neural networks from a single neural network?

1. Now, let us explore the idea of creating multiple neural networks out of a single neural network.
2. Consider a network with n-nodes. We can create sub-networks which operate using a subset of these n-nodes like shown in the figure.

Original Network | **Network with some nodes dropped out**



3. The excluded neurons are said to be dropout neurons and the network is called a dropped-out network
4. If we have n-neurons/nodes in a network, it is possible to create up to 2^N dropped-out networks from it. These networks are much less dense than the original network and can be used in an ensemble method without drastically increasing the training time.
5. Now, even for a relatively modest n value of say 100, we have a very large number of dropped out network. The question arises, **how do we train these networks?**
6. We can use the following tricks to train the dropped-out networks:
   a. Share parameters across all these neural networks
   b. Sample a different neural network for each training instance