*1. Why may the validation help to determine appropriate number of nodes in the hidden layer?*

In neural network, hidden layers are the layers between the input layer and the output layer. These layers, in conjunction, projects nonlinear behavior in a neural network. But, the optimum number of hidden layers are not constant for every problem and should be determined empirically. Because, if a problem has more or less than the optimum number of hidden layers, MLP will not converge within the regular time. So, to determine the number of hidden layers empirically, validation set is used. Validation set is a small set of input examples (not part of the training set) that is used to adjust the number of hidden layers. As it is not part of the actual training set, it mostly reflects the behavior of the neural network for new input data and thus by observing and changing the number of hidden layers, we can find the optimum number of hidden layers.

*2. How have you ensured efficient implementation of backpropagation algorithm?*

*3. Compare ANN with Decision tree.*

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| **Topic** | **Artificial Neural Network** | **Decision Tree** |
| **Use of Hidden Layers** | Yes | No |
| **Decision Boundary** | Non Liner | Sum of Liner Boundaries |
| **Complexity** | O(number of nodes) | Tree grows exponentially with respect to number of features |
| **Chances of Overfitting** | Possible, but can be adjusted | Most likely |
| **Use** | Mostly for binary data | Mostly for multi category data |
| **Understandability** | Hard to understand | Easy to understand |