# Grapheme-Phoneme Conversion using Neural Networks

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# Neural Networks

- We try to solve the grapheme-phoneme conversion problem using feed forward n/w trained using backpropagation.
- Encoding is done in the following way. Each phoneme is represented by 7 bits as we have 69 different phonemes. Each grapheme is represented by 5 bits as we have 26 different graphemes - letters A to Z.
- The neural networks has three layers. The input layer, a hidden layer and an output layer.
- The number if neurons in the hidden layer is chosen to be the average of number of neurons in input layer and hidden layer.

# Grapheme-Phoneme conversion

- In grapheme to phoneme conversion, size of input layer is 5*L, size of output layer is 7*L and hence size of hidden layer is 6*L. The value of L is set to 28
- We set the initial weights randomly and train this neural network using training data.
- Backpropogation formulae are used to generate new weights after reading each line of the corpus.
- We have trained the neural network for over 40 iterations.

# Phoneme-Grapheme conversion

- In phoneme to grapheme conversion, size of input layer is 7*L, size of output layer is 5*L and hence size of hidden layer is 6*L.
- We train the neural network in a similar way and use backpropogation formulae to find the weights in neural network.

# Conclusion

- In grapheme-phoneme conversion, accuracy is measured by seeing how many graphemes have given correct phonemes on a testing data set. We have achieved an accuracy of around 71 percent.
- In phoneme-grapheme conversion, accuracy is measured by seeing how many phonemes have given correct graphemes on a testing data set. We have achieved an accuracy of around 69 percent.