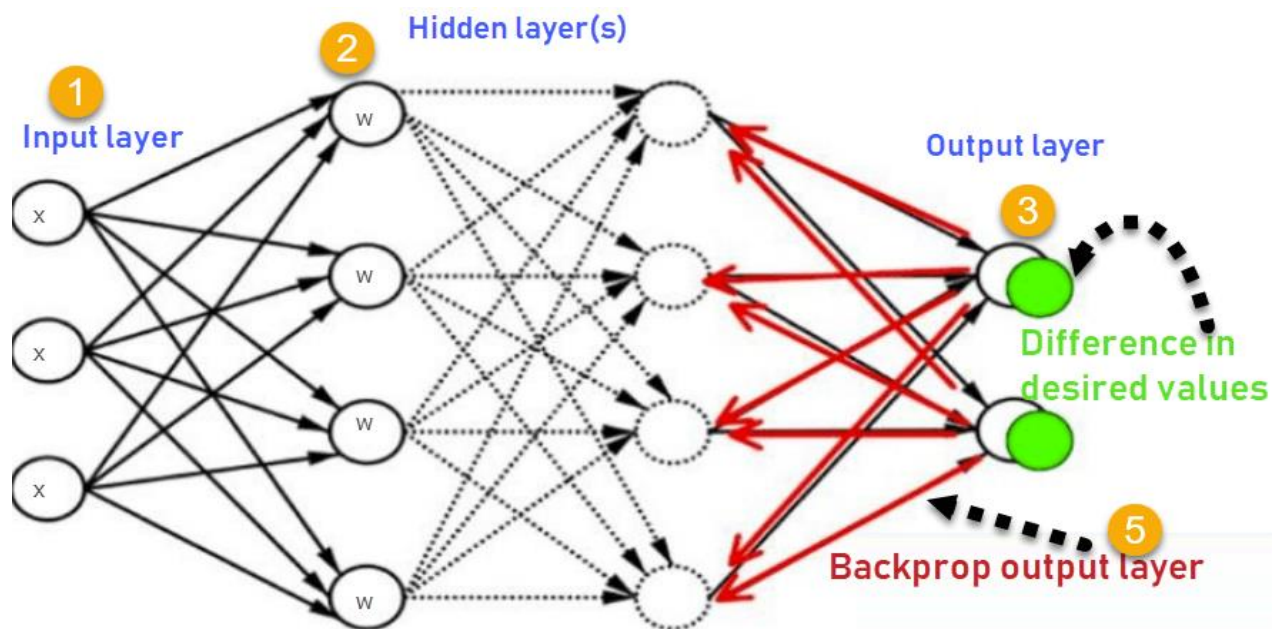


BACK PROPAGATION:

Backpropagation is the process where if there is a difference in the output from the network and the actual output then it is propagated back through the neural network to its input layer, where the weights are updated again based on the error and this updating lead to a different output. This process is done till we receive the desired output.

It is the essence of neural network training and this method of fine-tuning the weights of a neural network based on the error rate obtained in the previous epoch (i.e., iteration) reduces error rates and make the model reliable by increasing its generalization.

The Back propagation algorithm in neural network computes the gradient of the loss function for a single weight by the chain rule. It efficiently computes one layer at a time, unlike a native direct computation. It computes the gradient, but it does not define how the gradient is used. It generalizes the computation in the delta rule.



TYPES OF BACKPROPAGATION NETWORKS

There are two types of backpropagation networks are:

Static back-propagation:

It is one kind of backpropagation network which produces a mapping of a static input for static output. It is useful to solve static classification issues like optical character recognition.

Recurrent Backpropagation:

Recurrent Back propagation in data mining is fed forward until a fixed value is achieved. After that, the error is computed and propagated backward.

The main difference between both of these methods is: that the mapping is rapid in static back-propagation while it is non-static in recurrent backpropagation.

ADVANTAGES OF BACKPROPAGATION ARE:

- Backpropagation is fast, simple and easy to program
- It has no parameters to tune apart from the numbers of input
- It is a flexible method as it does not require prior knowledge about the network
- It is a standard method that generally works well
- It does not need any special mention of the features of the function to be learned.

DISADVANTAGES OF USING BACKPROPAGATION

- The actual performance of backpropagation on a specific problem is dependent on the input data.
- Back propagation algorithm in data mining can be quite sensitive to noisy data
- You need to use the matrix-based approach for backpropagation instead of mini-batch.

FORWARD PROPAGATION:

Forward propagation is how neural networks make predictions. Input data is “forward propagated” through the network layer by layer to the final layer which outputs a prediction. A **feedforward neural network** is an artificial neural network where the nodes never form a cycle. This kind of neural network has an input layer, hidden layers, and an output layer. It is the first and simplest type of artificial neural network.