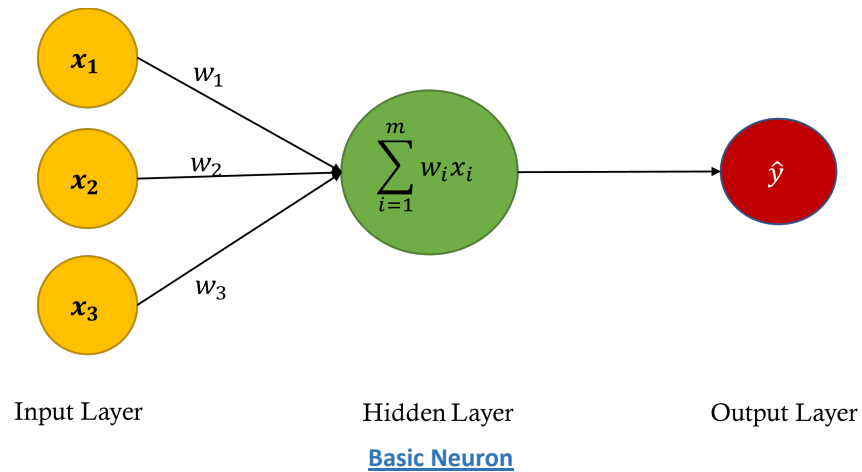
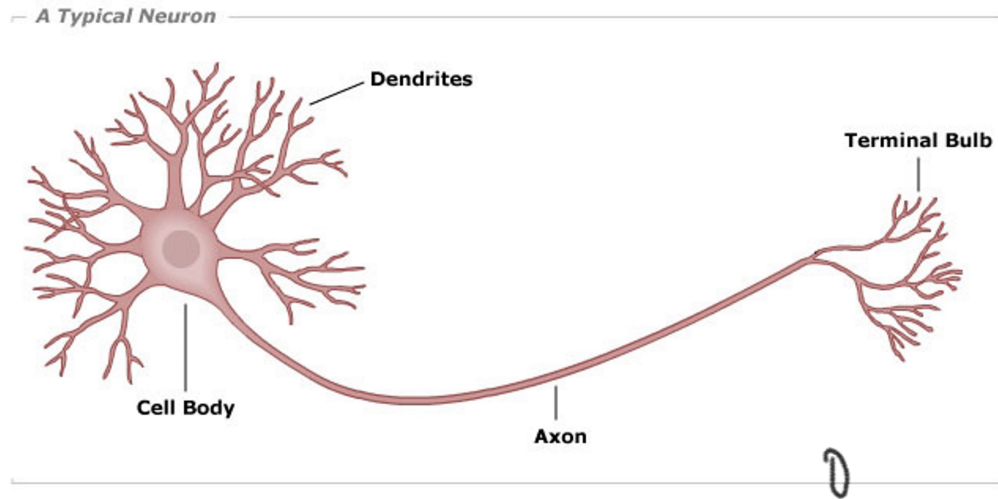


Neural Networks Basics

13 April 2018 10:56

Neuron in Human Brain



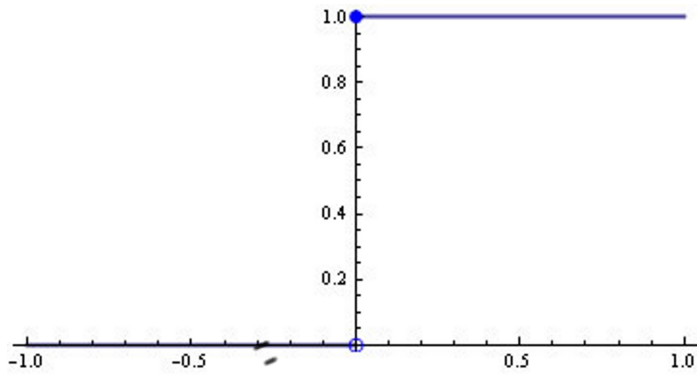
Cost Function (Linear)

$$C = \frac{1}{2}(\hat{y} - y)^2 \quad \text{where} \quad \hat{y} = \sum_{i=1}^m w_i x_i$$

Activation Functions

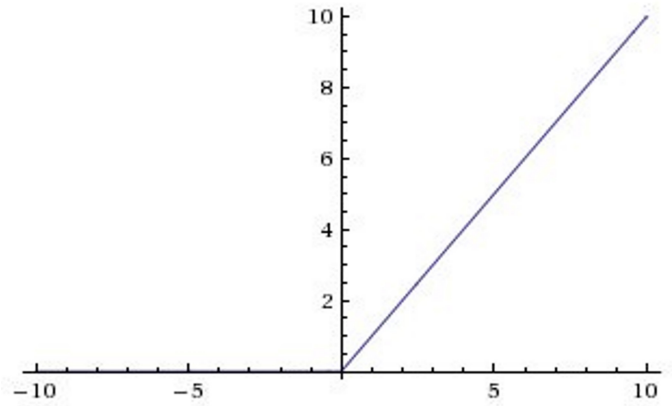
Step Function

$$y = \begin{cases} 1 & x \geq 0 \\ 0 & x < 0 \end{cases}$$



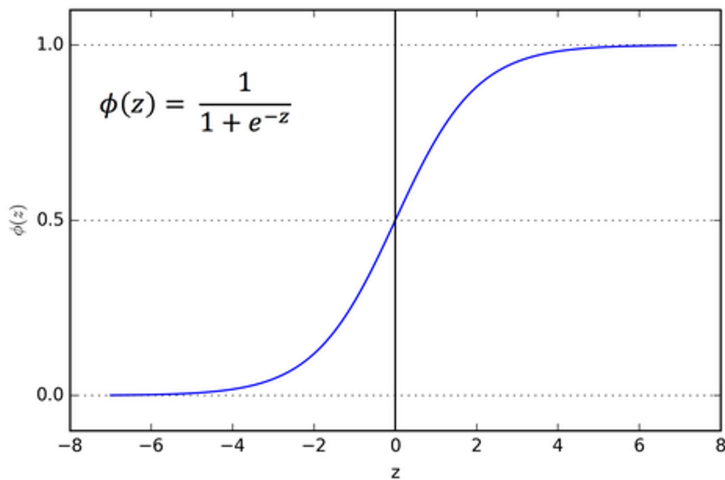
Rectified Linear Unit

$$y = \begin{cases} x & x \geq 0 \\ 0 & x < 0 \end{cases}$$



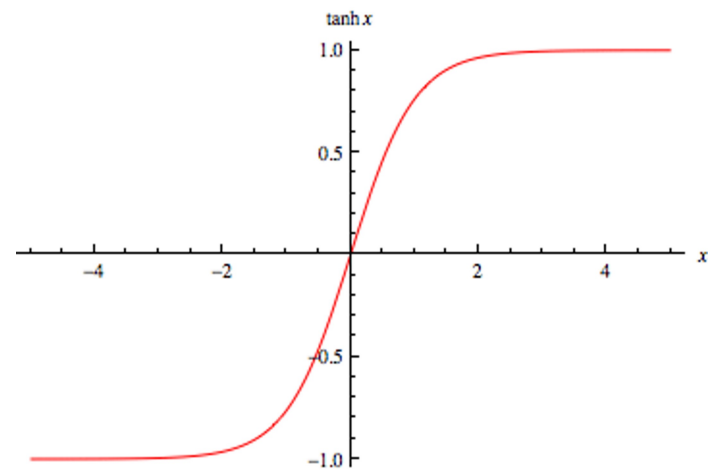
Sigmoid Function

$$y = \frac{1}{(1 + e^{-x})}$$

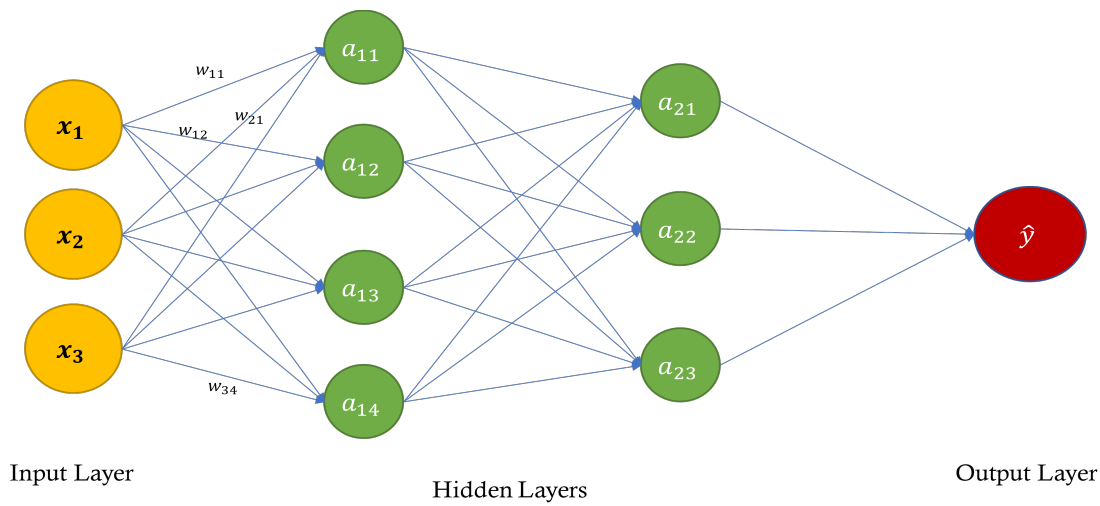


Tanh Function

$$y = \frac{e^x - e^{-x}}{e^x + e^{-x}}$$

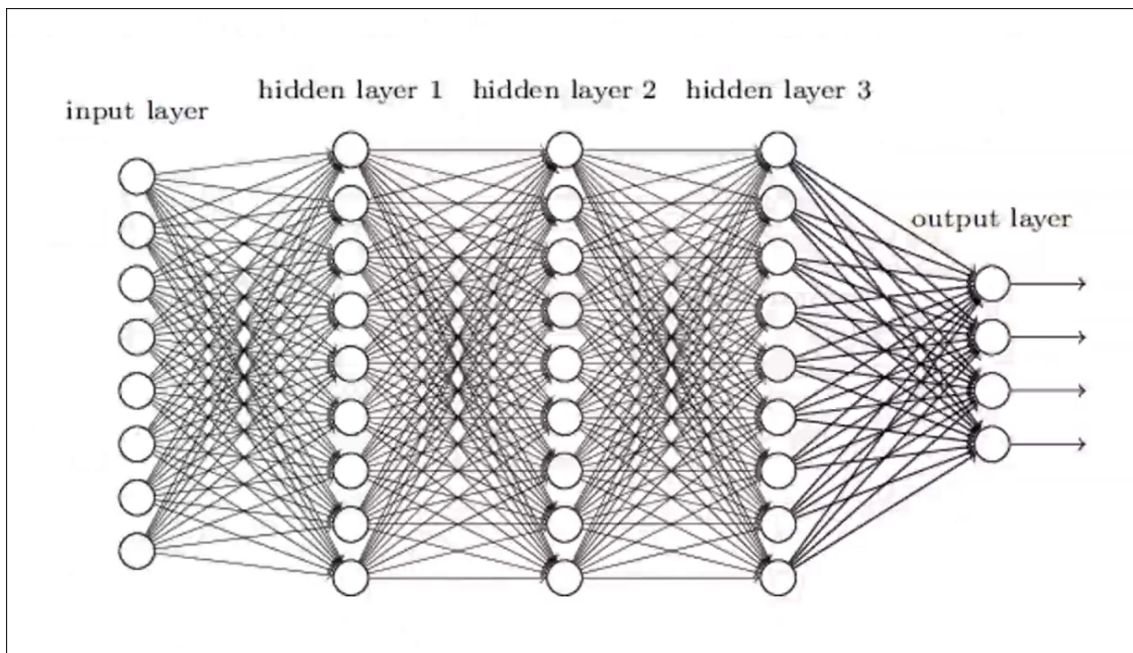


Multi-Layer Perceptron

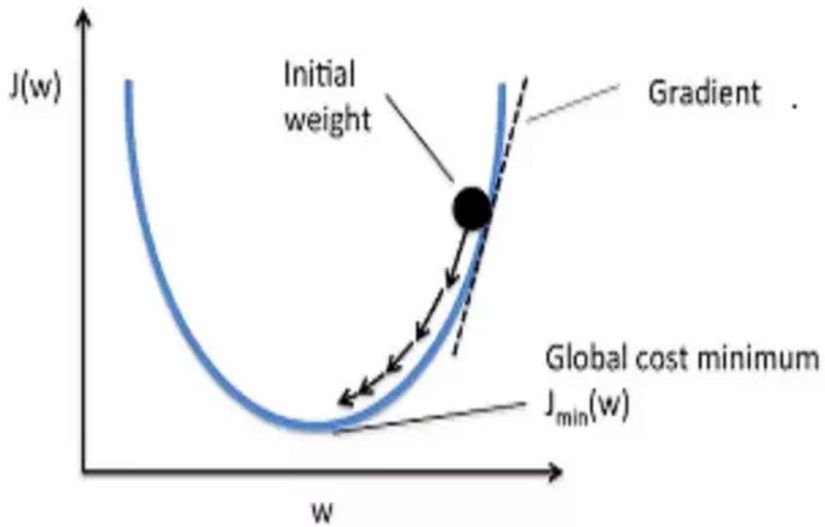


Multilayer Perceptron

No of Weights = $3*4 + 4*3 + 3 = 27$



Gradient Descent



Batch V/s Stochastic Gradient Descent

- Stochastic Gradient Descent helps avoid local minima
- Batch GD is deterministic algorithm which Stochastic is stochastic algorithm

Mini-Batch Gradient Descent

Back-Propagations

Neural Network Training Process Flow

