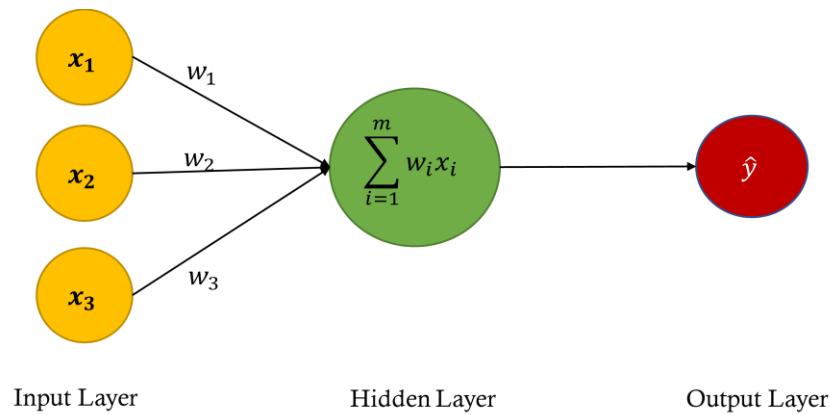
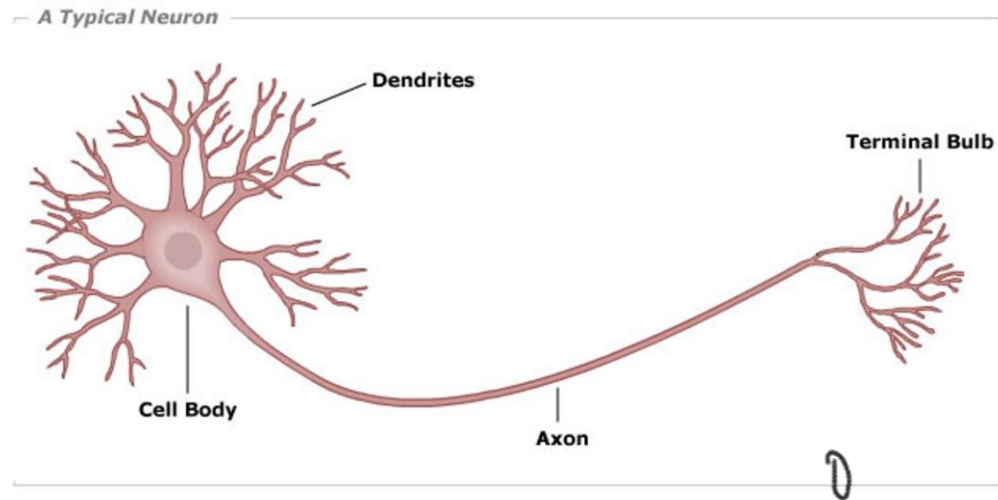


Neural Networks Basics

13 April 2018 10:56

Neuron in Human Brain



Basic Neuron

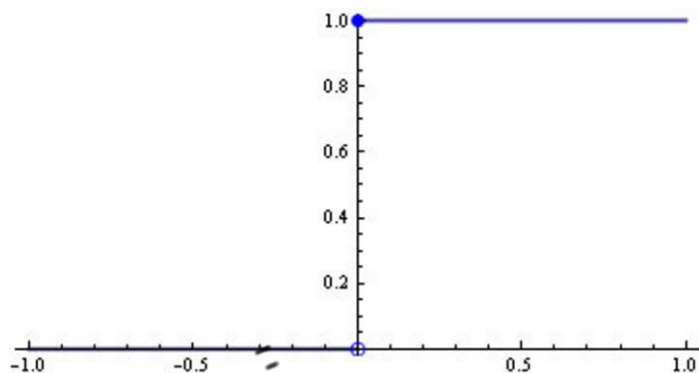
Cost Function (Linear)

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

Activation Functions

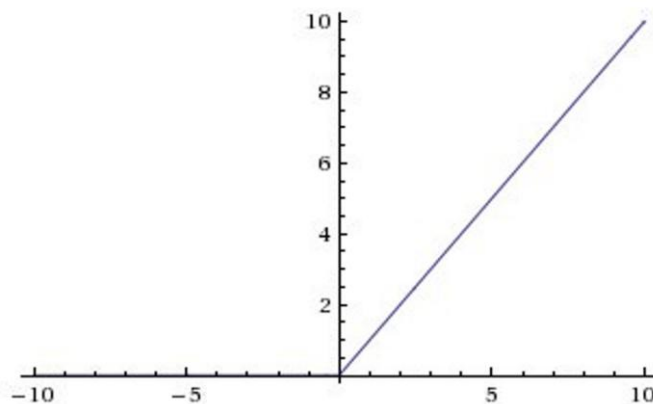
Step Function

$$y = \begin{cases} 1 & x \leq 0 \\ 0 & x \in 0 \end{cases}$$



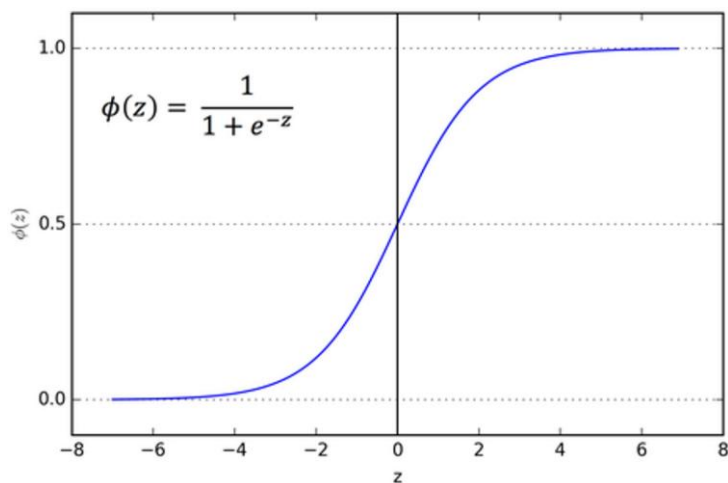
Rectified Linear Unit

$$y = \begin{cases} x & x \leq 0 \\ 0 & x \in 0 \end{cases}$$



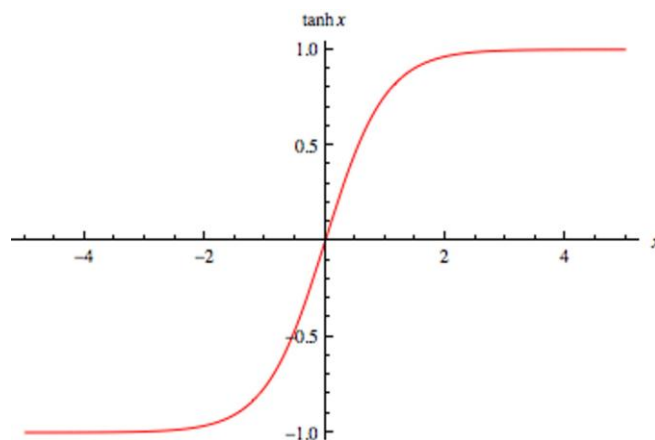
Sigmoid Function

$$y = \frac{1}{1 + e^{-s}}$$

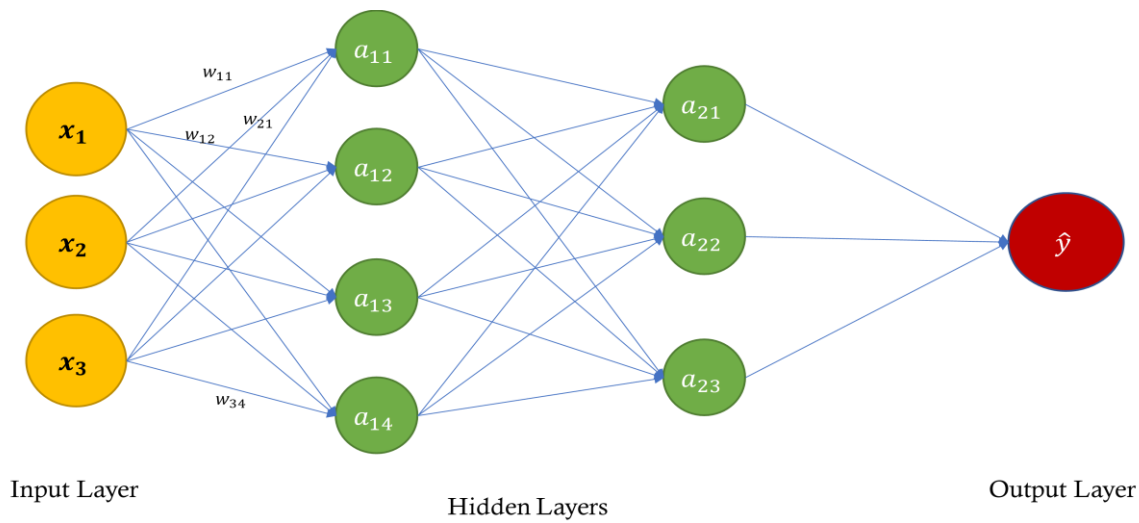


Tanh Function

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

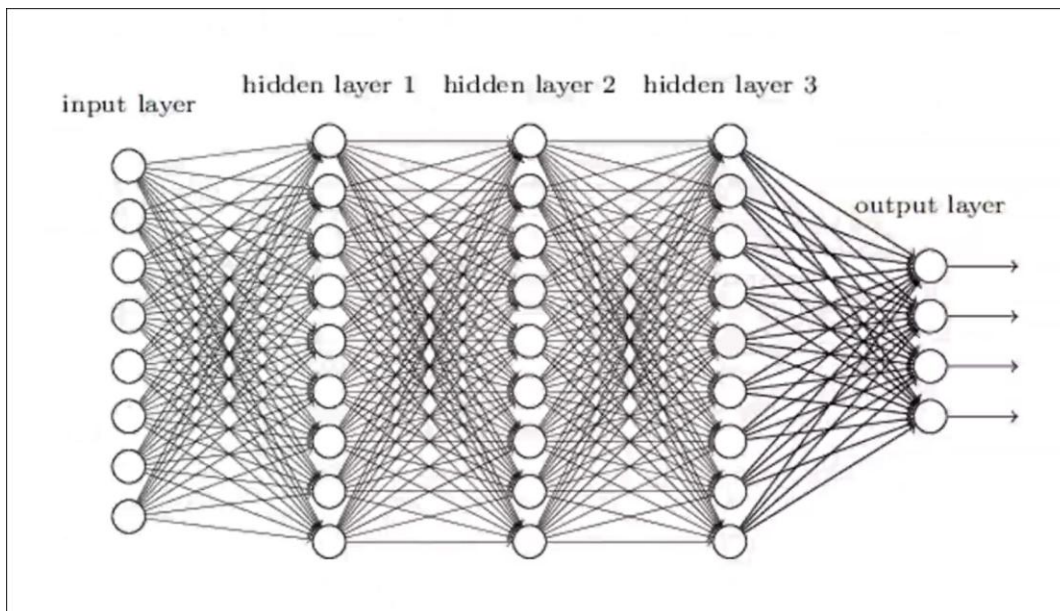


Multi-Layer Perceptron

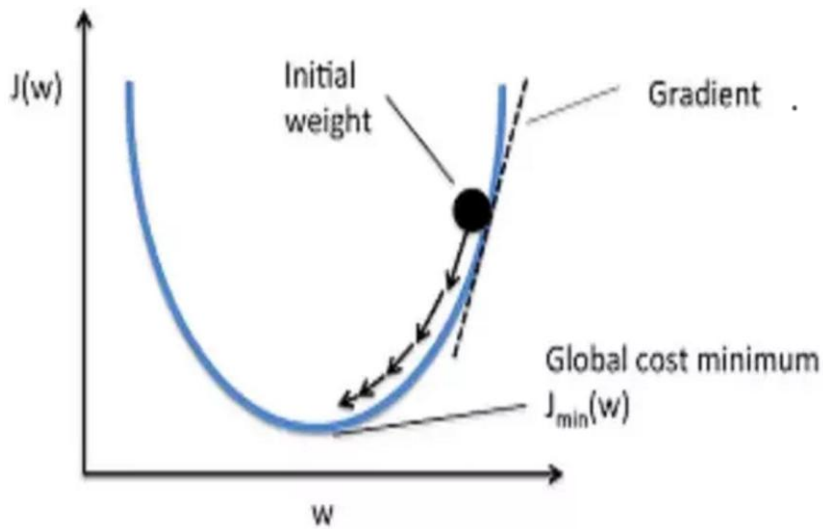


Multilayer Perceptron

No of Weights = $3 \times 4 + 4 \times 3 + 3 = 27$



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

