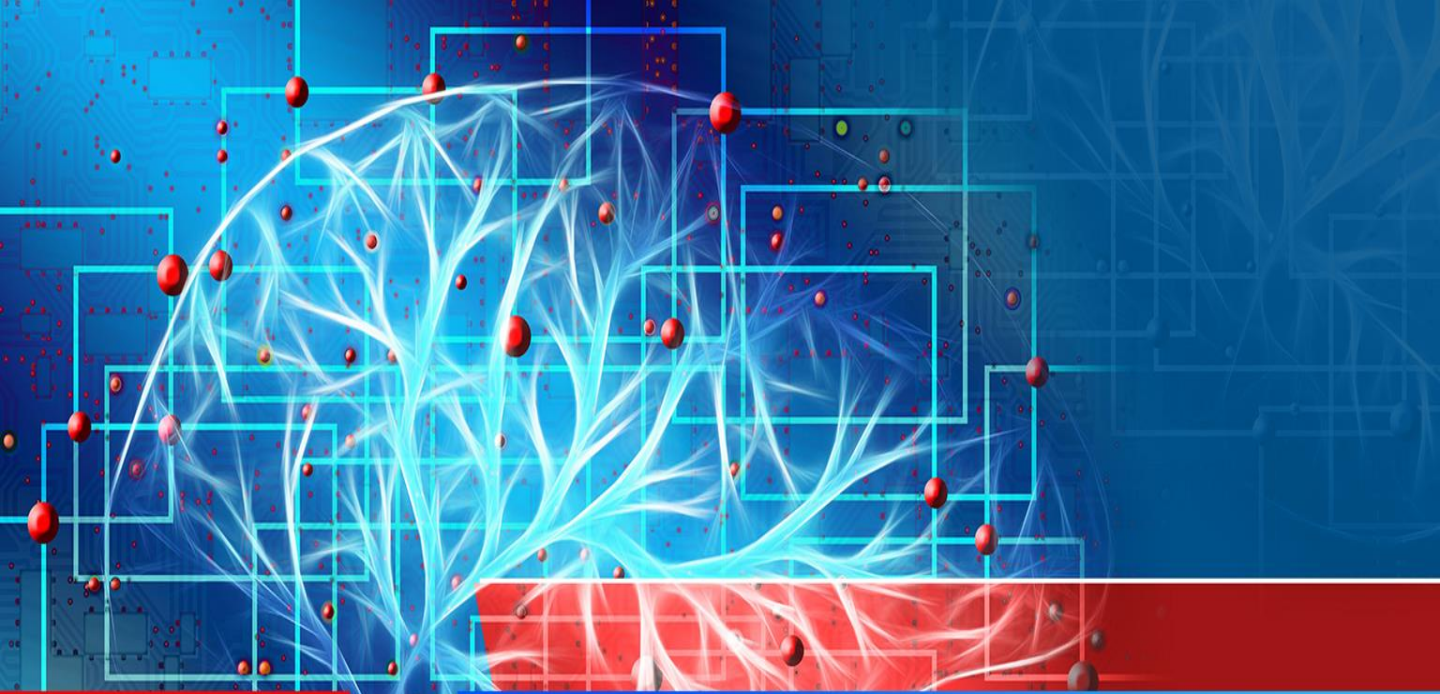

Neural Network Regression

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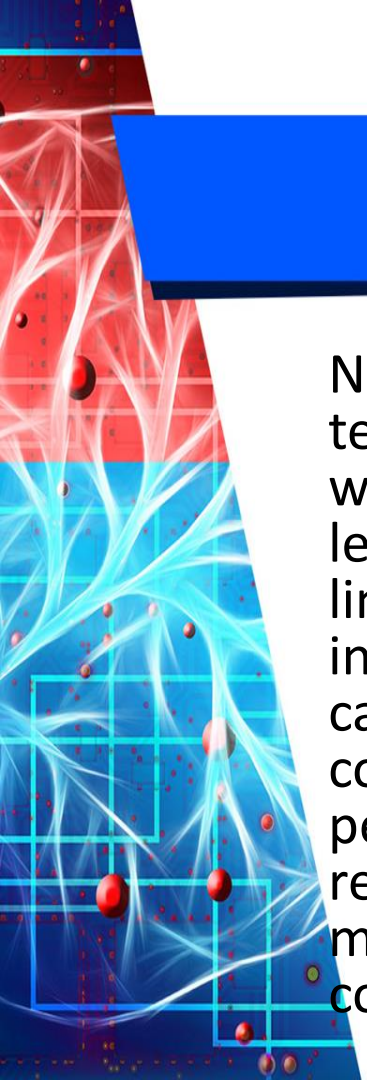
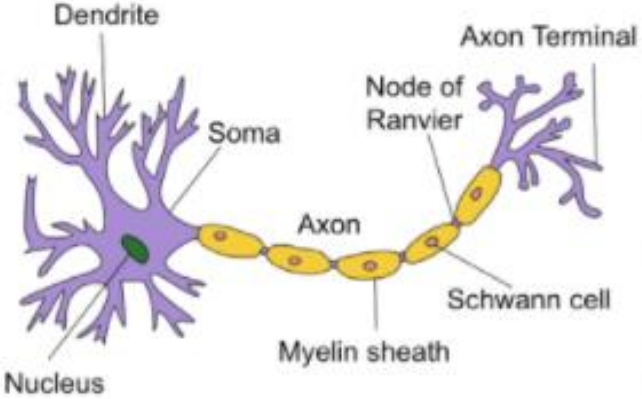
Contents



What is Neural Network?

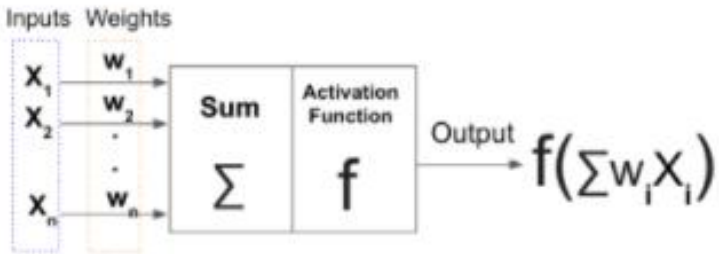
Neural Network is a machine learning technique or algorithm that try to mimic the working of neuron in human brain for learning. The brain is a highly complex, non-linear and parallel computer or an information-processing system. It has the capability to organize its structural constituents, known as neurons, so as to perform certain computations like pattern recognition, perception and motor control, many times faster than the fastest digital computer in existence today.

A typical Neuron vs Artificial Neuron



Structure of a typical neuron

(source: Wikipedia)



Structure of artificial neuron

What is Regression?

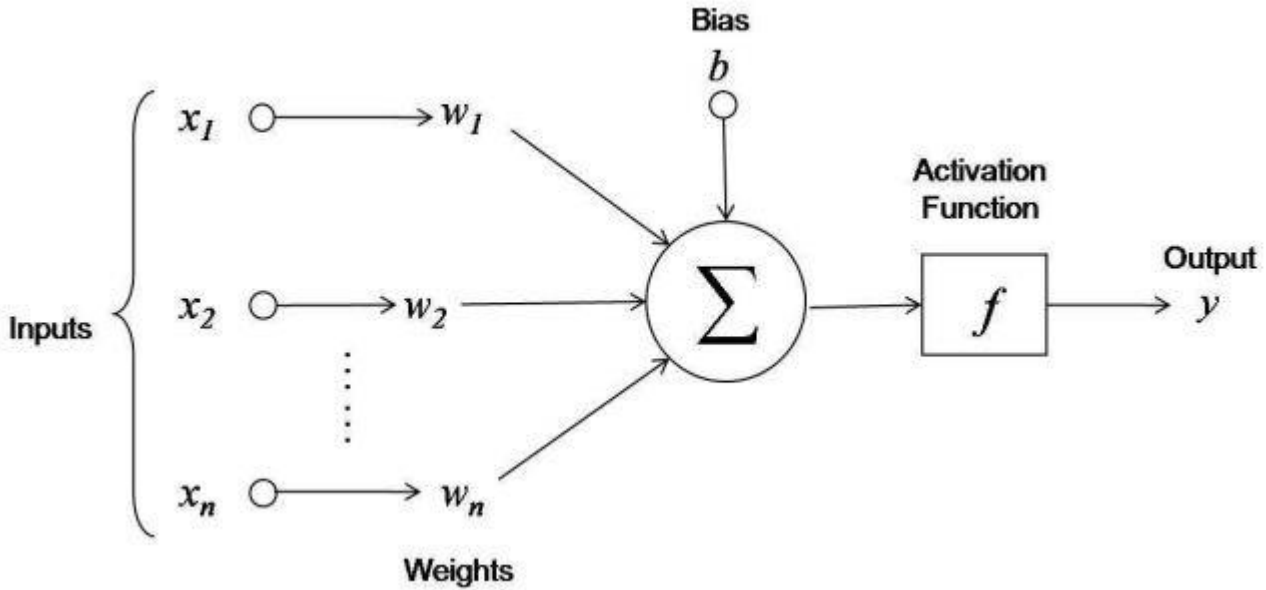
- Regression analysis is a form of predictive modelling technique which investigates the relationship between a dependent (target) nd independent variable (s) (predictor).
- This technique is used for forecasting, time series modelling and finding the causal effect relationship between the variables.

Types of Regression

The truth is that there are innumerable forms of regressions, which can be performed. Each form has its own importance and a specific condition where they are best suited to apply. Some prominent names are provided below:

- Linear Regression
- Logistic Regression
- Polynomial Regression
- Stepwise Regression
- Ridge Regression
- Lasso Regression
- ElasticNet Regression
- Time Series Regression

Using Neural Network with Regression



Training the Neural Network

1. Forward propagation

   An input vector propagates through the network

2. Weight update (backpropagation)

   the weights of the network will be changed in order to decrease the difference between the predicted and gold standard values

* We used back-propagation algorithm here because Back propagation is an iterative process in which values of the weights and biases slowly change, so that the NN usually computes more accurate output values.

Unit Test

5 unit tests are used:

1. **TestByData**
2. **TestWithMaxIteration**
3. **TestWithCSVData**
4. **TestWithMaxLearningRate**
5. **TestWithMinIteration**

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Thank
You