

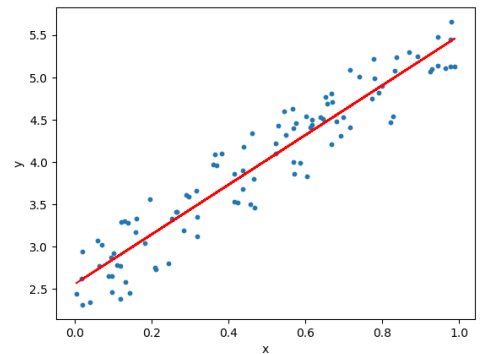
National University of Computer and Emerging Sciences CL 461 Artificial Intelligence

Lab Manual 12

Linear Regression & Neural Networks

Linear Regression

Linear regression attempts to model the relationship between two variables by fitting a linear equation to observed data. One variable is considered to be an explanatory variable, and the other is considered to be a dependent variable. For example, a modeler might want to relate the weights of individuals to their heights using a linear regression model.



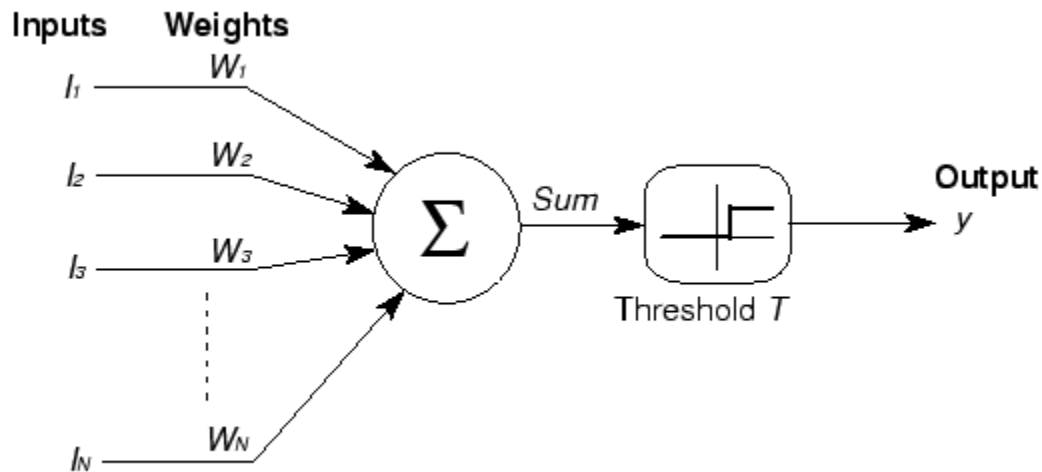
References

<https://towardsdatascience.com/linear-regression-in-real-life-4a78d7159f16>

<https://towardsdatascience.com/linear-regression-using-python-b136c91bf0a2>

Neural Network

A neural network is a series of algorithms that endeavors to recognize underlying relationships in a set of data through a process that mimics the way the human brain operates. In this sense, neural networks refer to systems of neurons, either organic or artificial in nature.



McCulloch-Pitts perceptron | Source: Wikimedia Commons

The implementation took four steps:

1. Initialize a perceptron with random weights
2. For each example in the training set, compute the output
3. If the output should have been 1 but was 0 instead, increase the weights with input 1 and vice-versa — if the output is 1 but should've been 0, decrease the weights with input of 1.
4. Repeat steps 2–4 for each example until the perceptron outputs correct values

References

<https://towardsdatascience.com/neural-networks-for-beginners-by-beginners-6bfc002e13a2>

<https://medium.com/swlh/artificial-neural-networks-for-absolute-beginners-a75bc1522e1d>