What the Hell is Perceptron?

The Fundamentals of Neural Networks
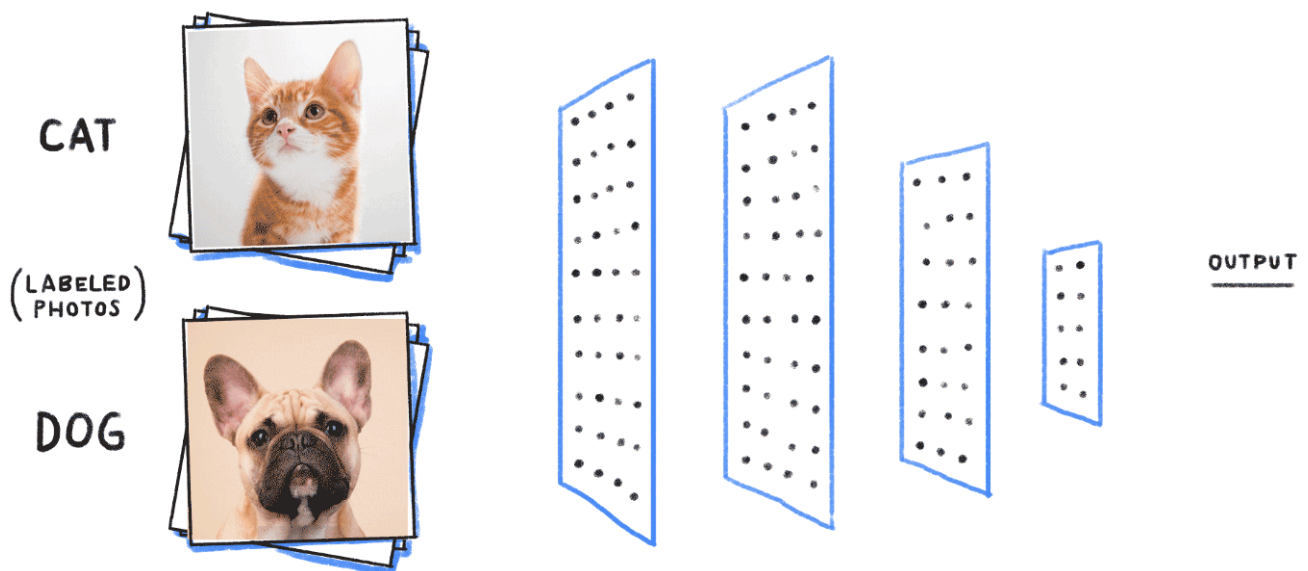
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> *Perceptron is a single layer neural network* and a multi-layer perceptron is called *Neural Networks*.

Perceptron is a linear classifier (binary). Also, it is used in supervised learning. It helps to classify the given input data. But how the heck it works ?

A normal neural network looks like this as we all know

Get this book 👇

Introduction to Machine Learning with Python: A Guide for Data Scientists

It helped me a lot. 🙌 👍

As you can see it has multiple layers.

The perceptron consists of 4 parts.

1. Input values or One input layer

2. Weights and Bias

3. Net sum

4. Activation Function

> *FYI: The Neural Networks work the same way as the perceptron. So, if you want to know how neural network works, learn how perceptron works.*
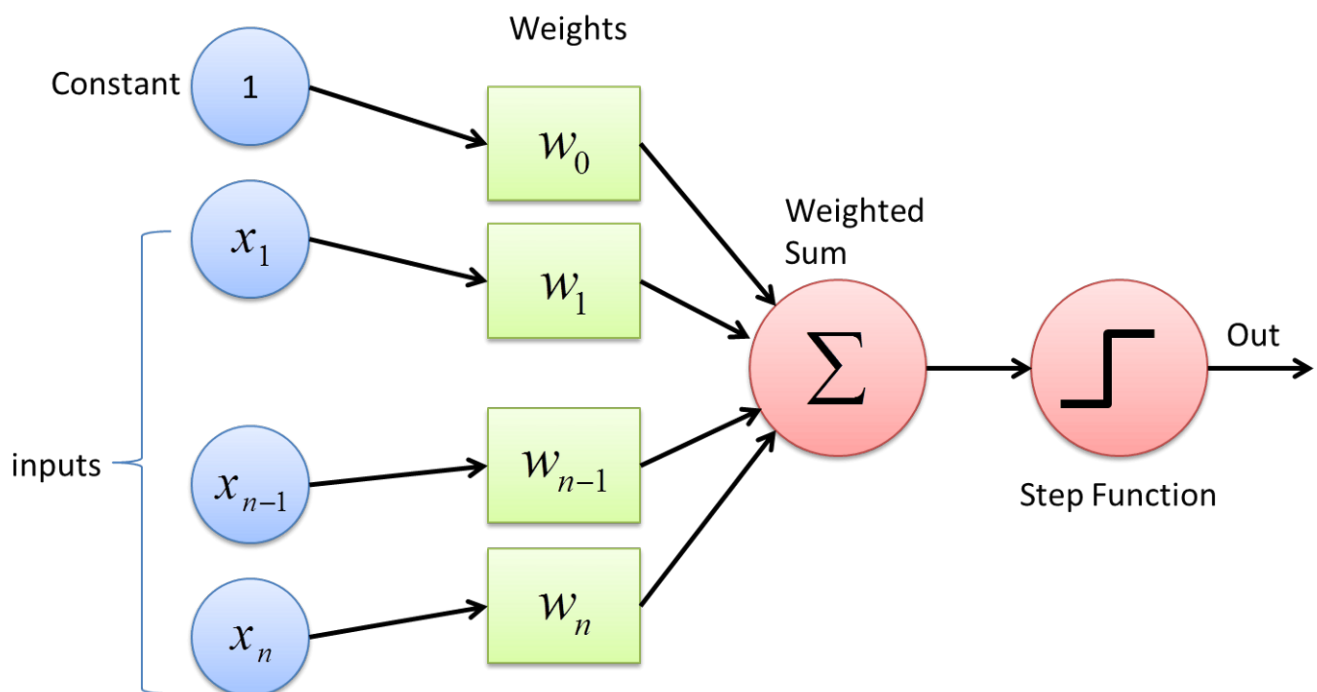

Fig : Perceptron

But how does it work?

The perceptron works on these simple steps

a. All the inputs x are multiplied with their weights w. Let's call it k.
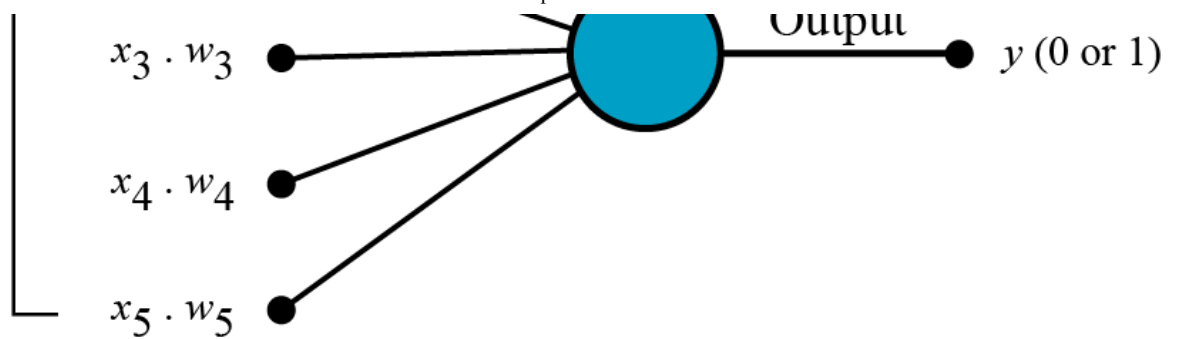
Inputs

$x_3 \cdot w_3$

$x_4 \cdot w_4$

Output

y (0 or 1)

$x_5 \cdot w_5$

Fig: Multiplying inputs with weights for 5 inputs

b. **Add** all the multiplied values and call them *Weighted Sum.*

term we end with

5

sigma for
summation

Σ **K** ← the formula for the **nth** term

k = 1

the term we start with

k is the index
(It's like a counter.
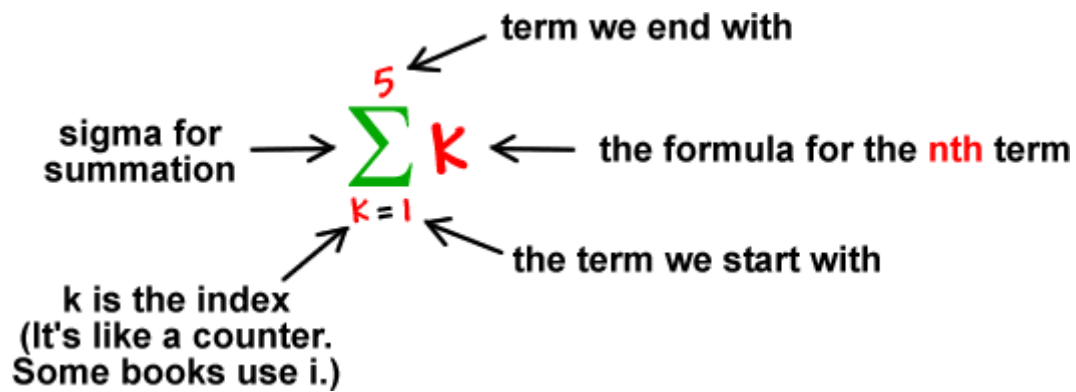Some books use i.)

Fig: Adding with Summation

c. **Apply** that weighted sum to the correct **Activation Function.**

For Example: Unit Step Activation Function.

Unit step (threshold)

1

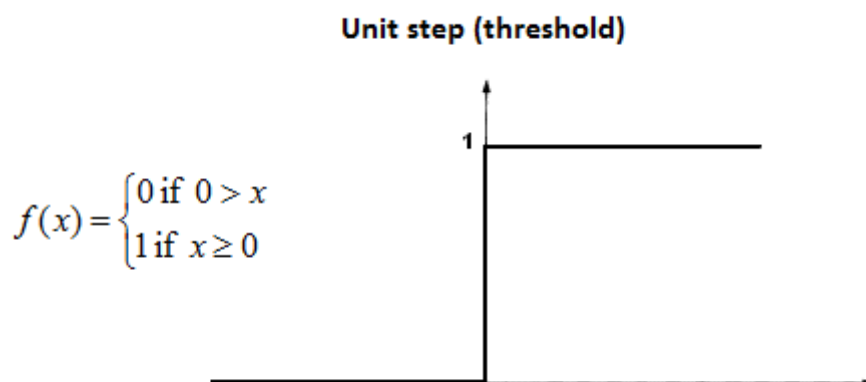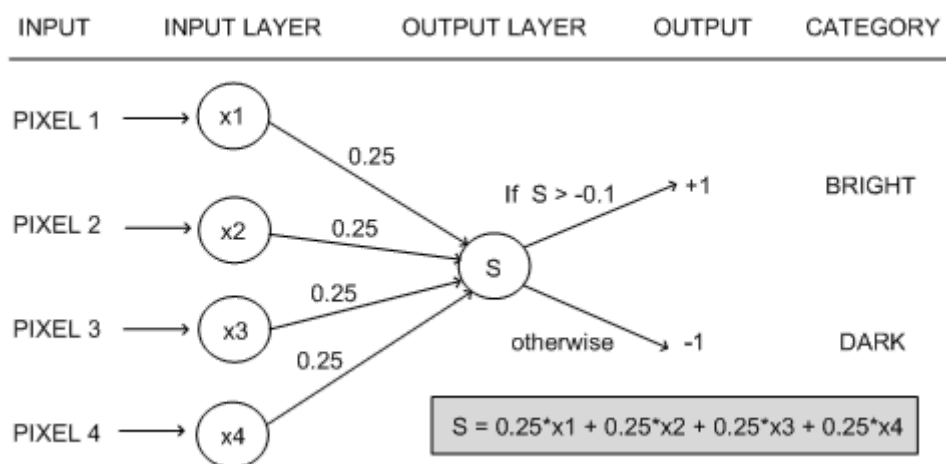$f(x) = \begin{cases} 0 \text{ if } 0 > x \\ 1 \text{ if } x \geq 0 \end{cases}$

Fig: Unit Step Activation Function

. . .

Why do we need Weights and Bias?

Weights shows the strength of the particular node.

A bias value allows you to shift the activation function curve up or down.
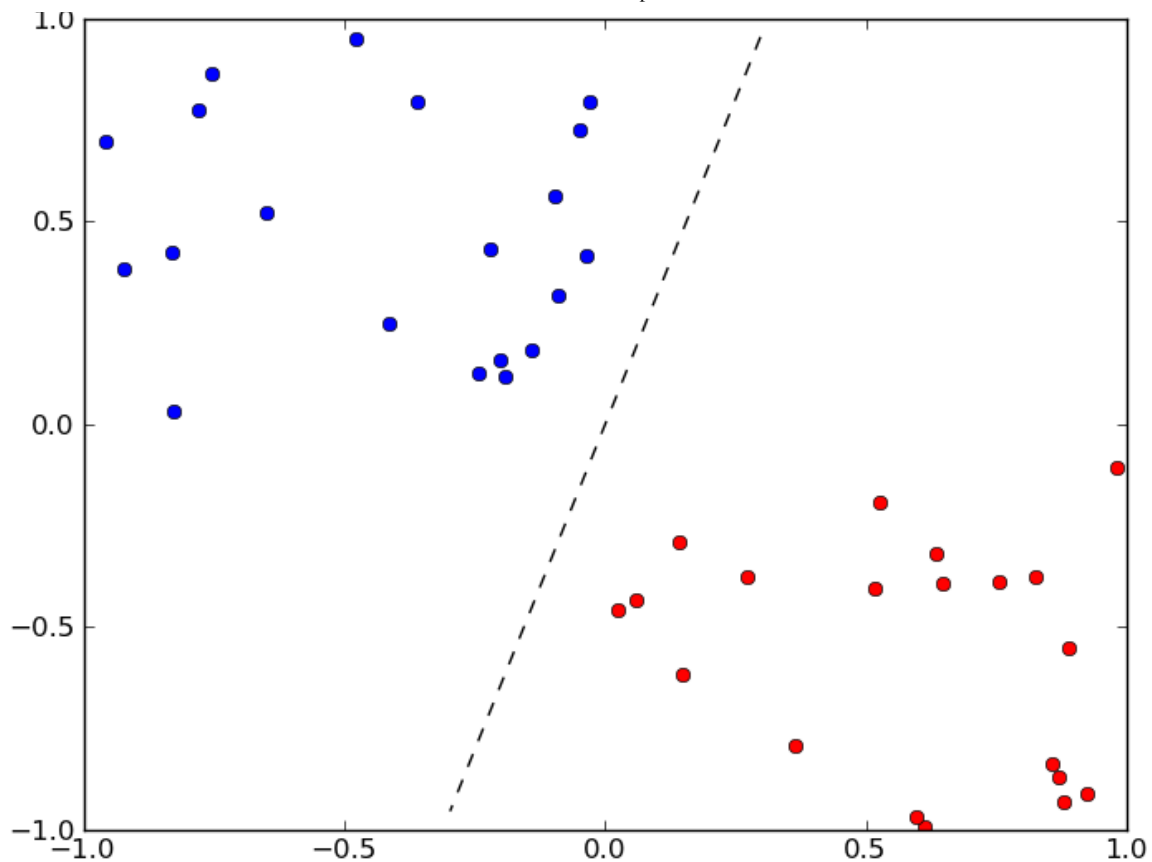

Why do we need Activation Function?

In short, the activation functions are used to map the input between the required values like (0, 1) or (-1, 1).

For a better explanation go to my previous story Activation Functions : Neural Networks.

Where we use Perceptron?

Perceptron is usually used to classify the data into two parts. Therefore, it is also known as a Linear Binary Classifier.

If you want to understand machine learning better offline too.

I will be posting 2 posts per week so don't miss the tutorial.

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Any comments or if you have any question, **write it in the comment.**

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Happy to be helpful. kudos…..
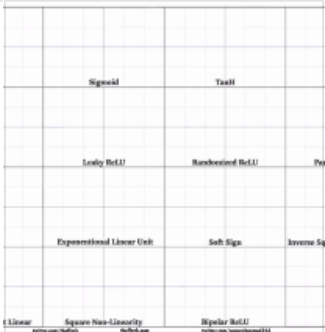
. . .

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4. **Activation Functions in Neural Networks and Its Types**

Activation Functions in Neural Networks and Its Types - theffork

It is a curve (sigmoid, tanH, ReLU) which is used to map the values of the network between bounded values. This is done...

theffork.com

5. What the Hell is "Tensor" in TensorFlow?

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