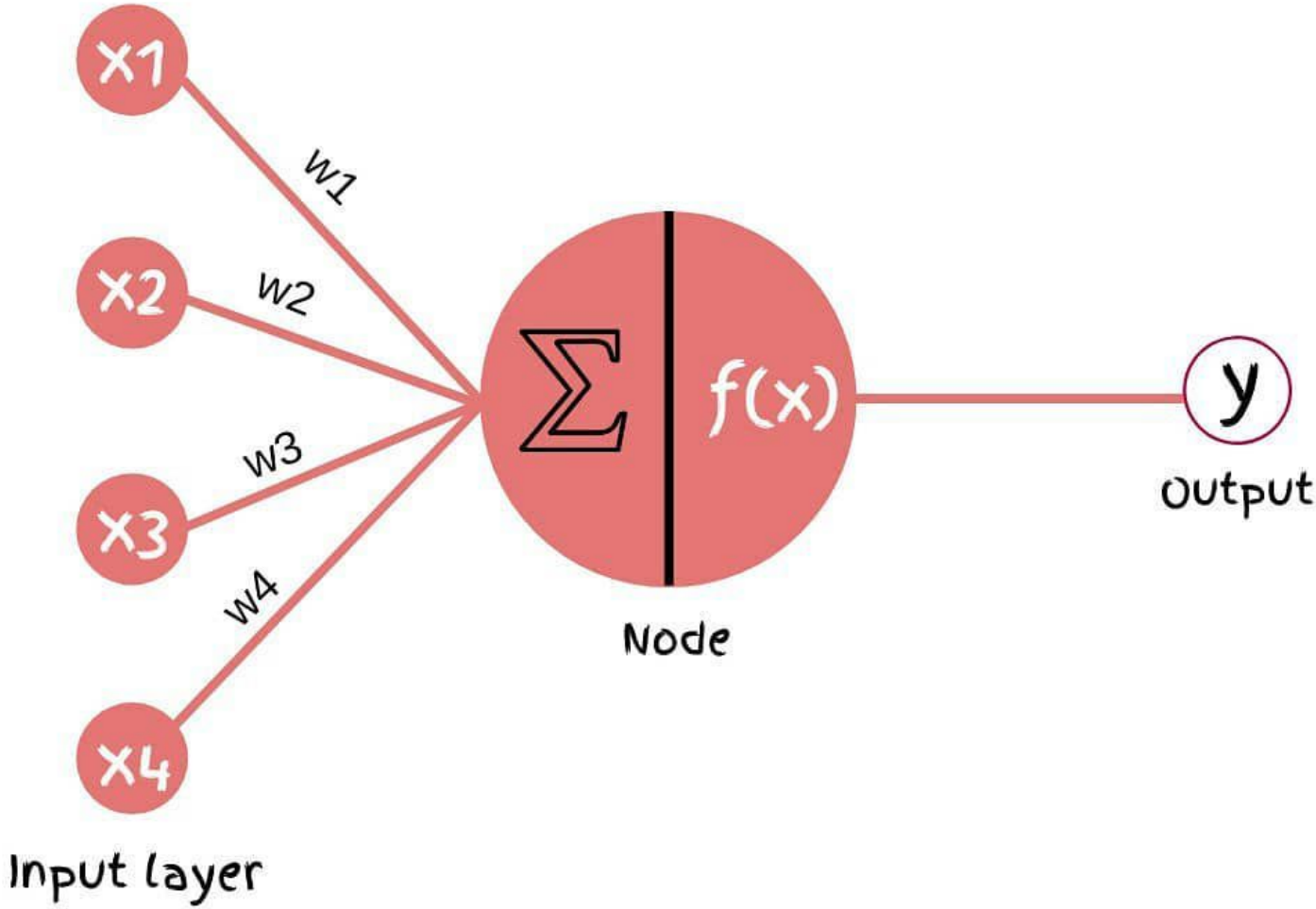
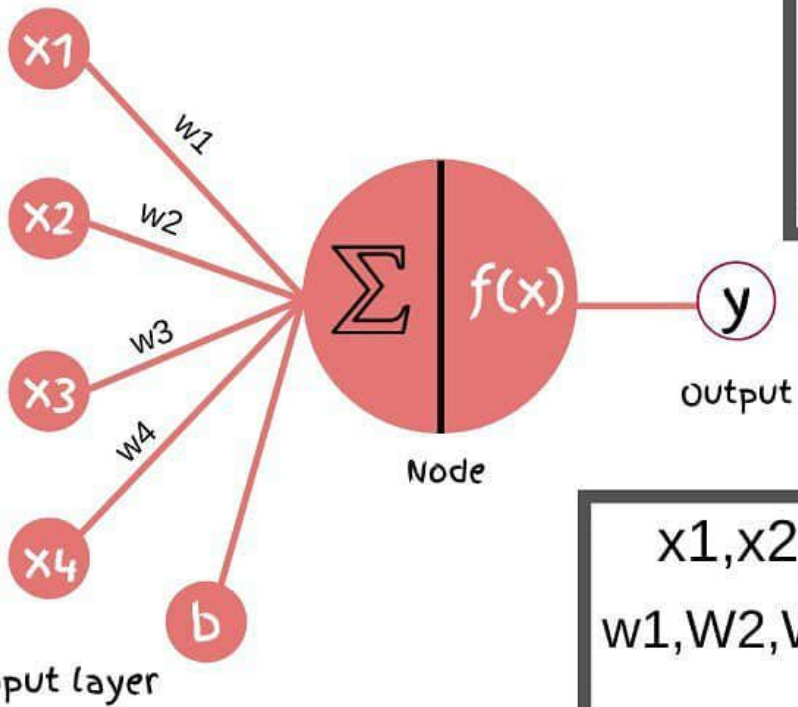


What is a Perceptron?

@learn.machinelearning

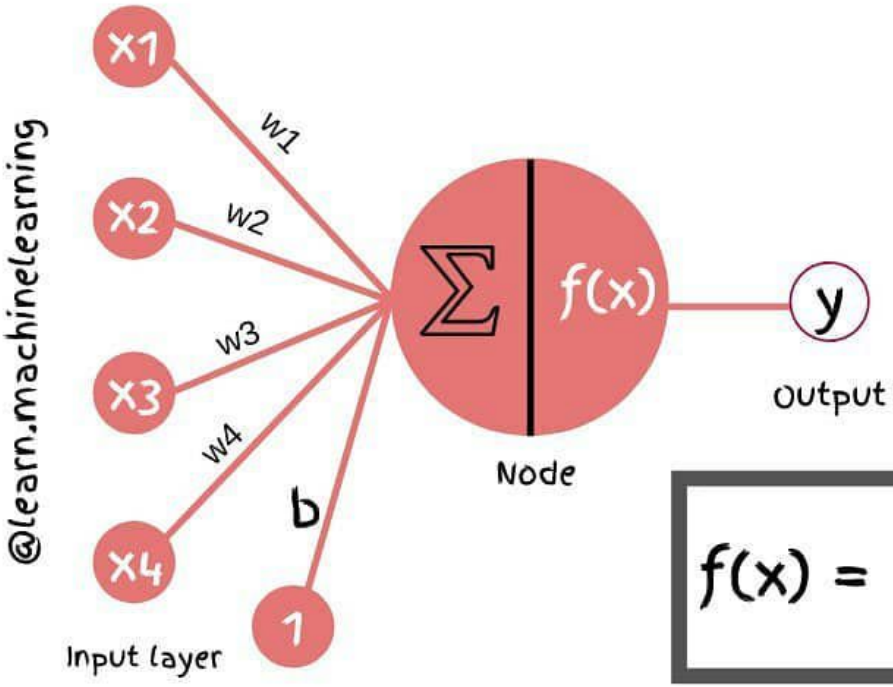


Σ	Weight sum of input and weights
f(x)	Function togenerate output from weighted sum

$$f(x) = \begin{cases} 1 \text{ if } w^T * X + b > 0 \\ 0 \text{ otherwise} \end{cases}$$

x1,x2,x3,x4	Input features
w1,W2,W3,W4	Weights
y	Output generated by function
b	bias

- It was designed in 1957 by Rosenblatt
- An artificial neuron(Perceptron) is a mathematical function based on a model of biological neurons, where each neuron takes inputs, weighs them separately, sums them up and passes this sum through a function to produce output.

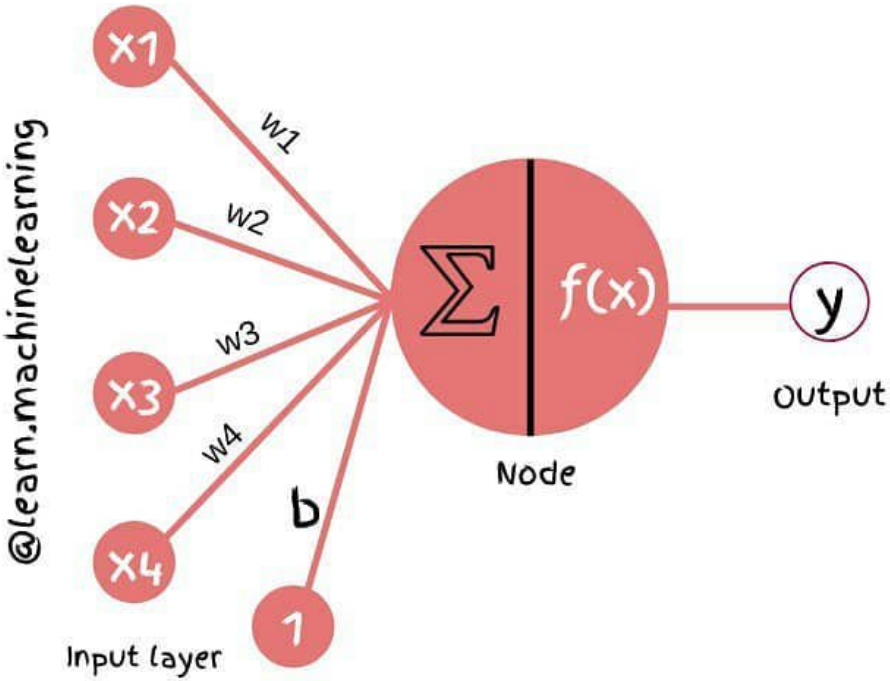


$$f(x) = \begin{cases} 1 \text{ if } w^T * X + b > 0 \\ 0 \text{ otherwise} \end{cases}$$

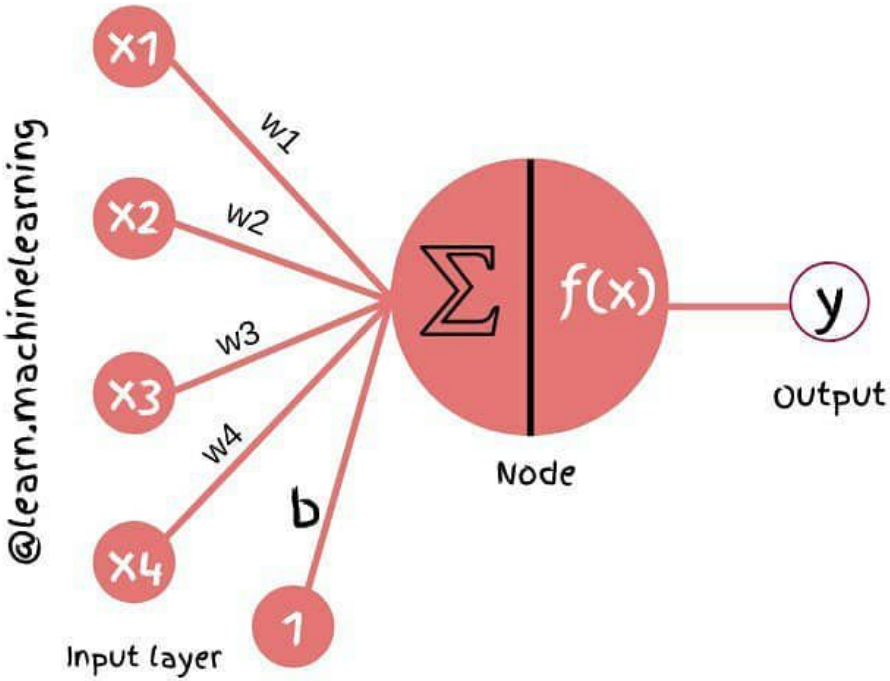
- Here f(x) is called as activation function.
- In early days they used step function as activation function.
- And they used gradient descent to find the best weights which gives low error.

$$\sum = W1*x1 + W2*x2 + W3*x3 + W4*x5 + 1*b$$

- This is the most simplest version of biological neuron.
- These weights helps in defining which feature is important than others.



- As i said they used step function to generate output from weighted sum.
- A Perceptron is an algorithm for supervised learning of binary classifiers.
- This algorithm enables neurons to learn and processes elements in the training set one at a time.
- types of Perceptrons:
  - Single layer
  - Multilayer



- Single layer Perceptrons(which we disucced) can learn only linearly separable patterns.
- Multilayer Perceptrons or feedforward neural networks with two or more layers have the greater processing power.
- A bias(b) value allows you to shift the activation function curve up or down.
- Perceptron is usually used to classify the data into two parts. Therefore, it is also known as a Linear Binary Classifier.