



SNS COLLEGE OF TECHNOLOGY



Coimbatore-35.

An Autonomous Institution

COURSE NAME : 19CST302 NEURAL NETWORKS AND DEEP LEARNING

III YEAR/ VI SEMESTER

UNIT – I BASICS OF NEURAL NETWORKS



NEURAL NETWORKS



Perceptron :

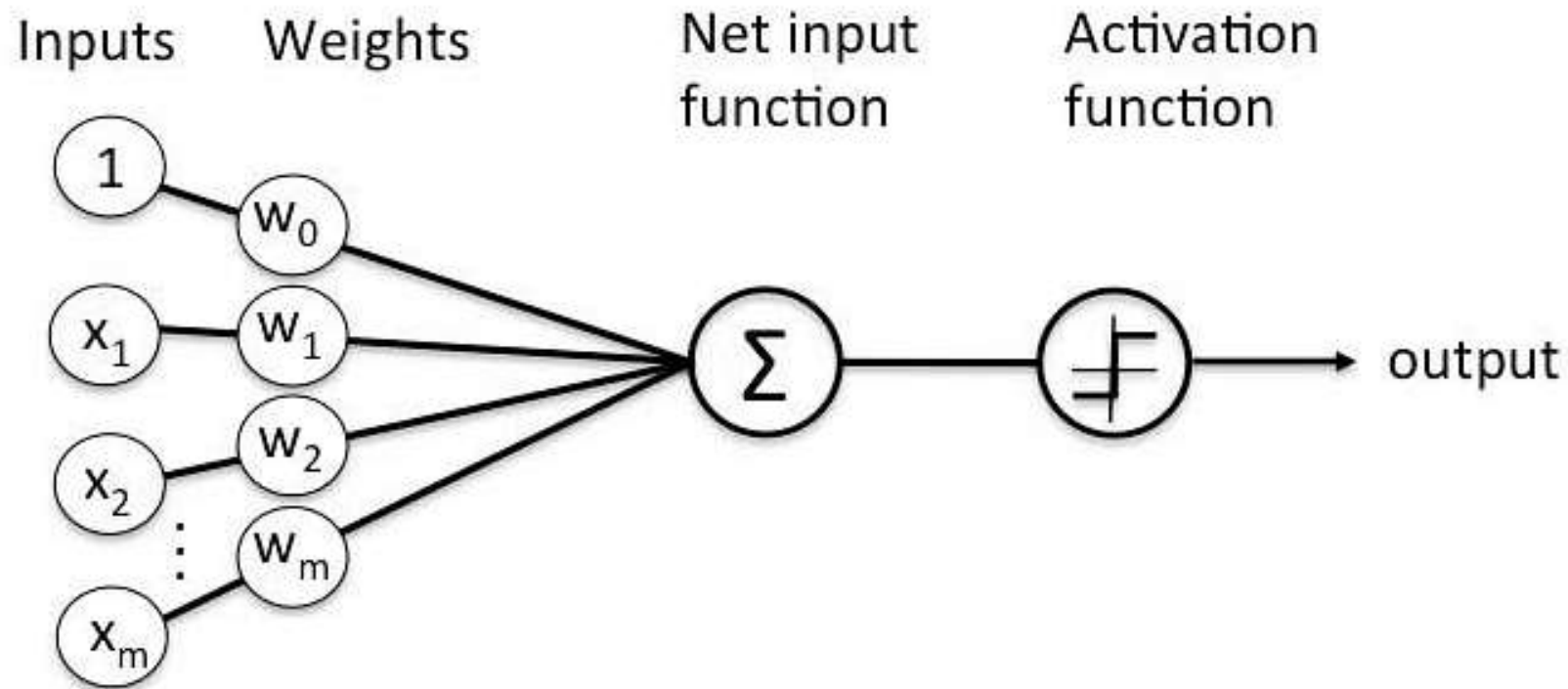
- Perceptron was introduced by Frank Rosenblatt in 1957.
- He proposed a Perceptron learning rule based on the original MCP neuron.
- A Perceptron is an algorithm for supervised learning of binary classifiers.
- This algorithm enables neurons to learn and processes elements in the training set one at a time.



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Perceptron :





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Basic Components of Perceptron :

- **Input Layer:** The input layer consists of one or more input neurons, which receive input signals from the external world or from other layers of the neural network.
- **Weights:** Each input neuron is associated with a weight, which represents the strength of the connection between the input neuron and the output neuron.
- **Bias:** A bias term is added to the input layer to provide the perceptron with additional flexibility in modeling complex patterns in the input data.
- **Activation Function:** The activation function determines the output of the perceptron based on the weighted sum of the inputs and the bias term. Common activation functions used in perceptrons include the step function, sigmoid function, and ReLU function.



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Basic Components of Perceptron :

- **Output:** The output of the perceptron is a single binary value, either 0 or 1, which indicates the class or category to which the input data belongs.
- **Training Algorithm:** The perceptron is typically trained using a supervised learning algorithm such as the perceptron learning algorithm or backpropagation. During training, the weights and biases of the perceptron are adjusted to minimize the error between the predicted output and the true output for a given set of training examples.



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Types of Perceptron:

1. **Single layer:** Single layer perceptron can learn only linearly separable patterns.
2. **Multilayer:** Multilayer perceptron can learn about two or more layers having a greater processing power.

The Perceptron algorithm learns the weights for the input signals in order to draw a linear decision boundary.



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Types of Perceptron models :

- **Single Layer Perceptron model:** One of the easiest ANN(Artificial Neural Networks) types consists of a feed-forward network and includes a threshold transfer inside the model. The main objective of the single-layer perceptron model is to analyze the linearly separable objects with binary outcomes. A Single-layer perceptron can learn only linearly separable patterns.
- **Multi-Layered Perceptron model:** It is mainly similar to a single-layer perceptron model but has more hidden layers.



Thank You!