

Data Science with Python : Multilayer Perceptron #429

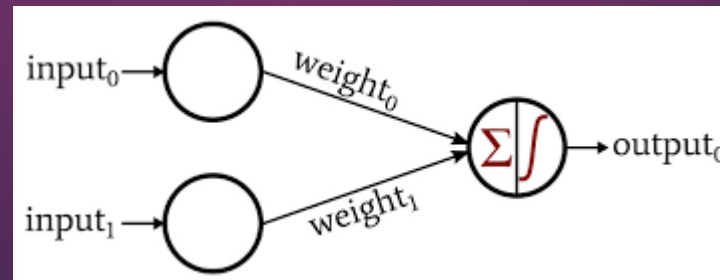
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Multilayer Perceptron:

- It is one of the Deep learning models.
- It is a black box technique as it is a automatic feature extraction.
- It learns at each layer.
- At first layer it learns low level information, at hidden layer it learns mid level and high level information.
- At each layer it tries to learn and those are known as representatives.
- It is made up of cells/perceptron.
- It is a fully connected to each perceptron, hence known as dense/fully connected network.
- It is known as multilayered as it has hidden layers which make it different from perceptron algorithm.
- Every cell other than the input cell, has two components:
activation component and integration component.



When it used?

- It is used when the output is numeric.
- When the inputs are linear or non-linear.

What are the other names of multilayer perceptron?

- Fully connected network.
- Dense network.
- Artificial neural network(ANN)

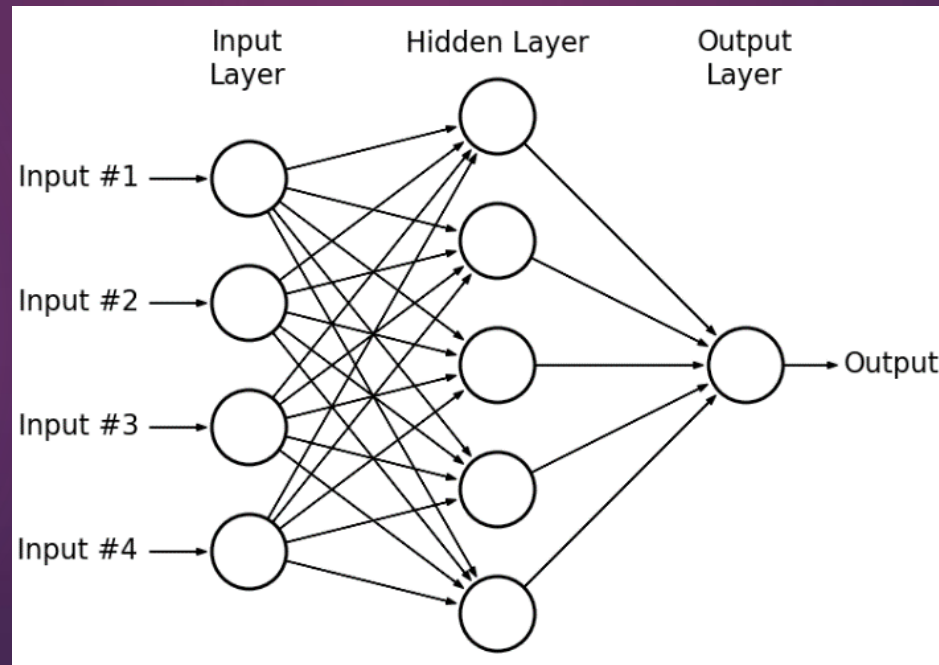
How does this work?

Inputs are passed and then weights are assigned randomly, weights which results in less errors are chosen and then output is given.

Formula for assignment of weights:

$$\text{weight} = \text{weight} + \text{learning rate} * (\text{expected} - \text{predicted}) * x$$

X= input



- When output is continuous, then output will have a single cell.
- When output is discrete and have binary data, then output have a single or binary cells.
- When output is discrete and have multiple data, then output have the cells on number of inputs passed.

Multilayer Perceptron (MLP) [30]

Advantages

- Can be applied to complex non-linear problems.
- Works well with large input data.
- Provides quick predictions after training.
- The same accuracy ratio can be achieved even with smaller data.

Disadvantages

- It is not known to what extent each independent variable is affected by the dependent variable. Computations are difficult and time consuming.
- The proper functioning of the model depends on the quality of the training