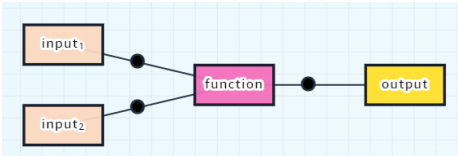
Building blocks of a network: computational graphs

A computational graph has an input node where data is fed into the graph, a function node where the input data is processed, and an output node which is the result of the computation.



Data flow from input to output through the graph

We can represent all sorts of algorithms with computational graphs. We show linear regression and logistic regression as computational graphs below:

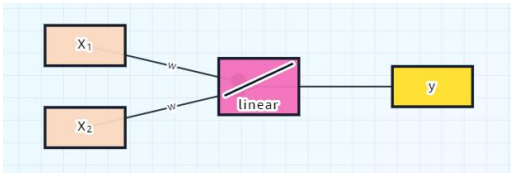
1) Linear Regression

$$y = w_0 + w_1 X_1$$

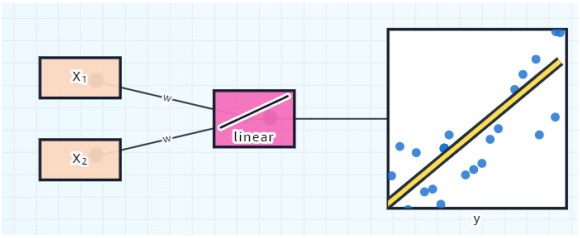
1. Add weights to each edge connecting the input nodes to the function nodes.[i]

2. Update our function to represent a linear function of a weighted sum:

$$\text{linear} = \sum_{i=1}^{n} w_i X_i$$



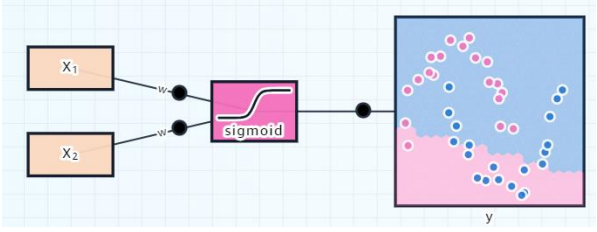
The output based on input data reflects change of state of the corresponding model for example, if the function changes to sigmoid, the corresponding model is logistic regression; if it changes to a step function, the corresponding model is a perceptron.



2) Logistic Regression

Change of linear function to a sigmoid function wherein, the input data has a binary target variable and output reflects a classification problem:

$$\text{sigmoid} = \frac{1}{1 + e^{-w_i X_i}}$$



The output background shows the decision regions