# How NN Learns?

1. Hardcoding

2. Let the program understand the data - learn its own

The NN learns with the second way. Below are the graphs how NN learns by adjusting weights. In the first two of the graphs, it is possible to see how a *Perceptron* adjusts weights by minimizing the *Cost* function. The last graph is about how the NN minimize the *Cost* function by learning from the data set.

In the last graph, the NN predicts $\hat{y}$ for each row (each single observation) of the data set, and calculates the *Cost* function for each. In the second step, it calculates the total cost by adding up all single *Cost* functions. Finally, by sending the *Cost* information (**error**) to the weights, backpropagation, after a series of epoch, it finds a set of weights that minimizes the total *Cost* function for the data set.
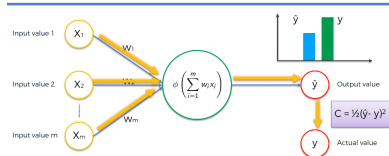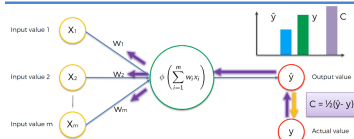
Resources:

A list of cost functions used in neural networks, alongside applications

begingroup$ What are common cost functions used in evaluating the performance of neural networks? (feel free to skip the rest of this question, my intent here is simply to provide clarification on notation that answers may use to help them be

https://stats.stackexchange.com/questions/154879/a-list-of-cost-functions-used-in-neural-networks-alongside-applications