Deep Learning w/ Python

2021.6.3

Chapter 1-What is Deep Learning

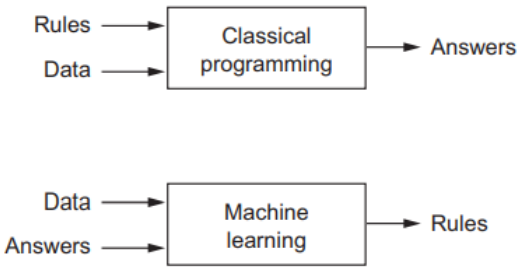

Figure 1.2 Machine learning: a new programming paradigm

Deep learning is a specific subfield of machine learning. How many layers contribute to a model of the data is called the **depth** of the model. The core of deep learning is (mostly) **neural network**, structured in literal layers stacked on top of each other. For our purpose, deep learning is a mathematical framework for learning representations from data.

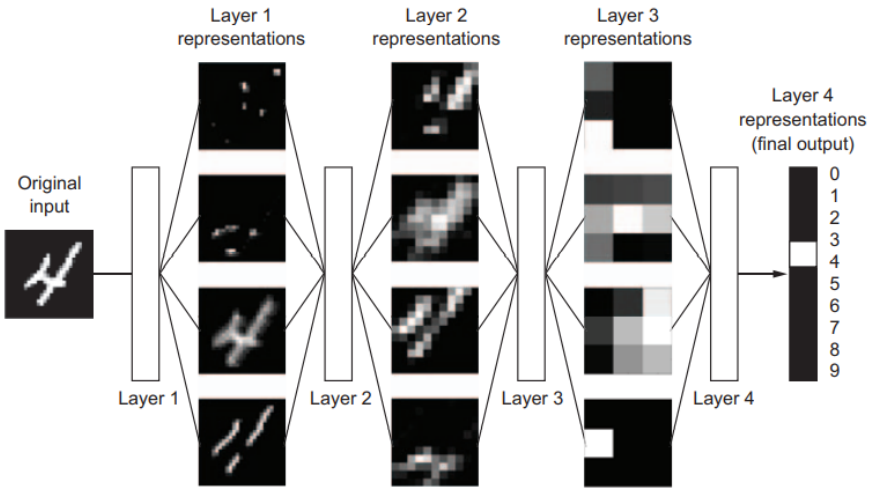

Figure 1.6 Deep representations learned by a digit-classification model

As you can see in figure 1.6, the network transforms the digits image into representations that are increasingly different from the original image and increasingly informative about the final result. You can think of a deep network as a multistage informative-distillation operation, where information goes through successive filters and comes out increasingly purified.

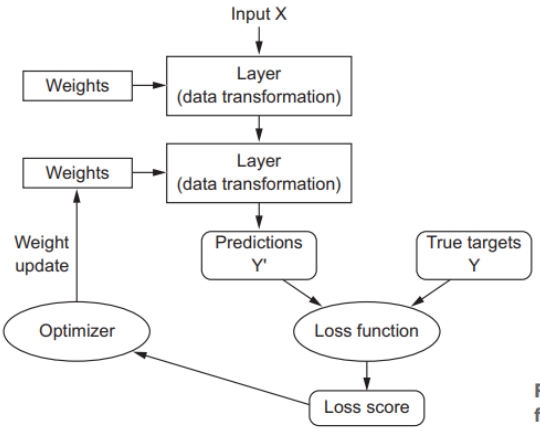

Figure 1.9 The loss score is used as a feedback signal to adjust the weights.

Initially, the weights of the network are assigned random values, so the network merely implements a series of random transformations. Naturally, its output is far from what it should ideally be, and the loss score is accordingly very high. But with every example the network processes, the weights are adjusted a little in the correct direction, and the loss score decrease. This is the *training loop*, which repeated a sufficient number of times, yields the weight value that min the loss function. A network with a minimal loss is one for which the outputs are as close as they can be to the targets: a trained network.