深度学习基础课程
Deep Learning Foundation Course

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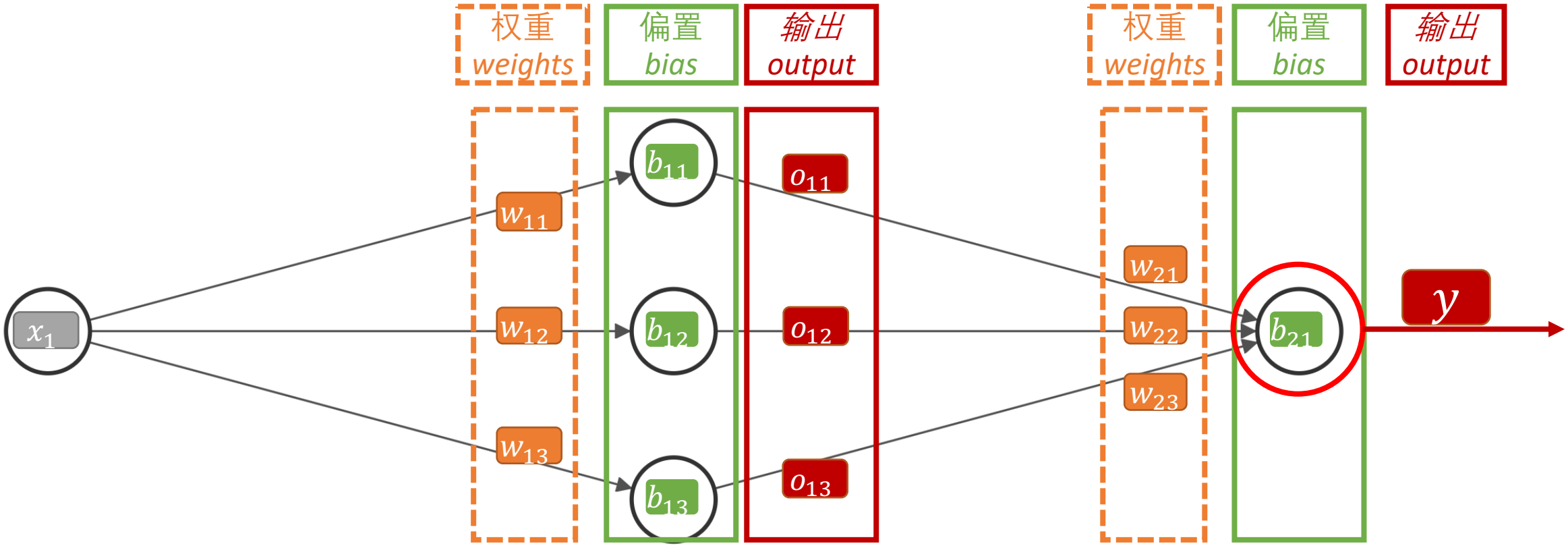
神经网络参数以及神经元的计算

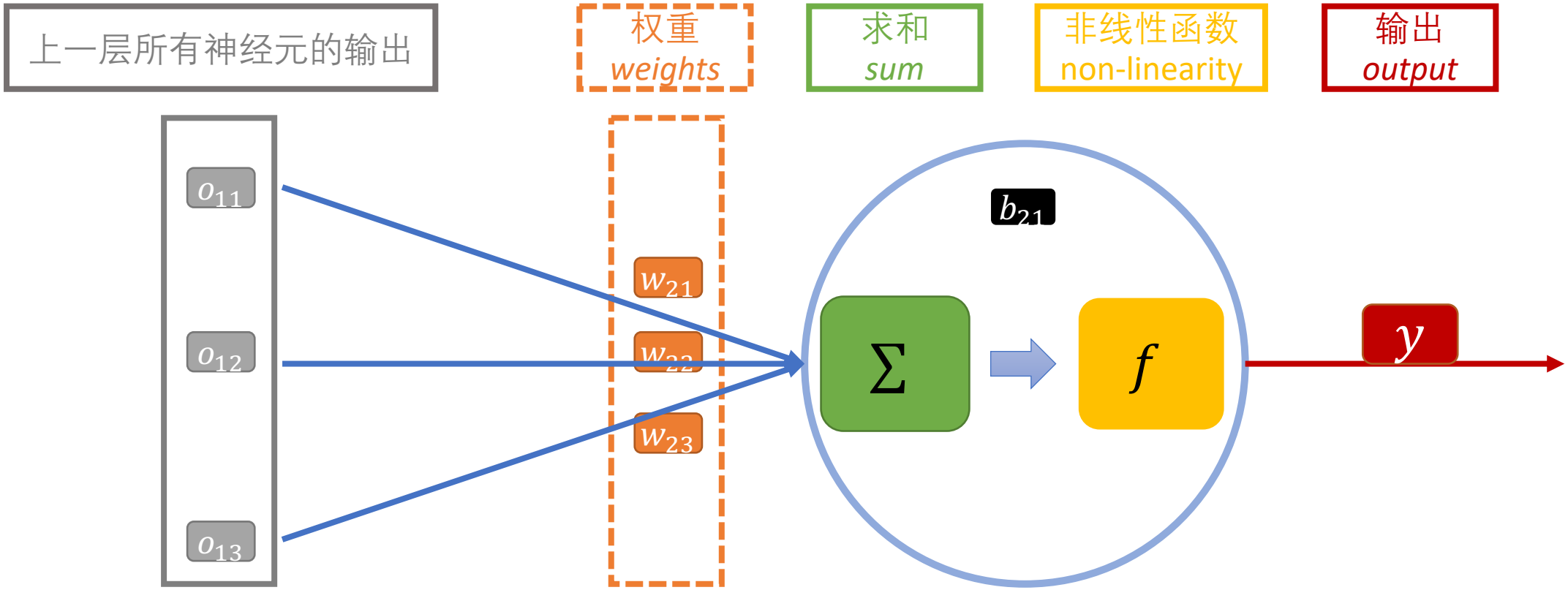


Input Layer $\in \mathbb{R}^1$

Hidden Layer $\in \mathbb{R}^3$

Output Layer $\in \mathbb{R}^1$

神经网络参数以及神经元的计算

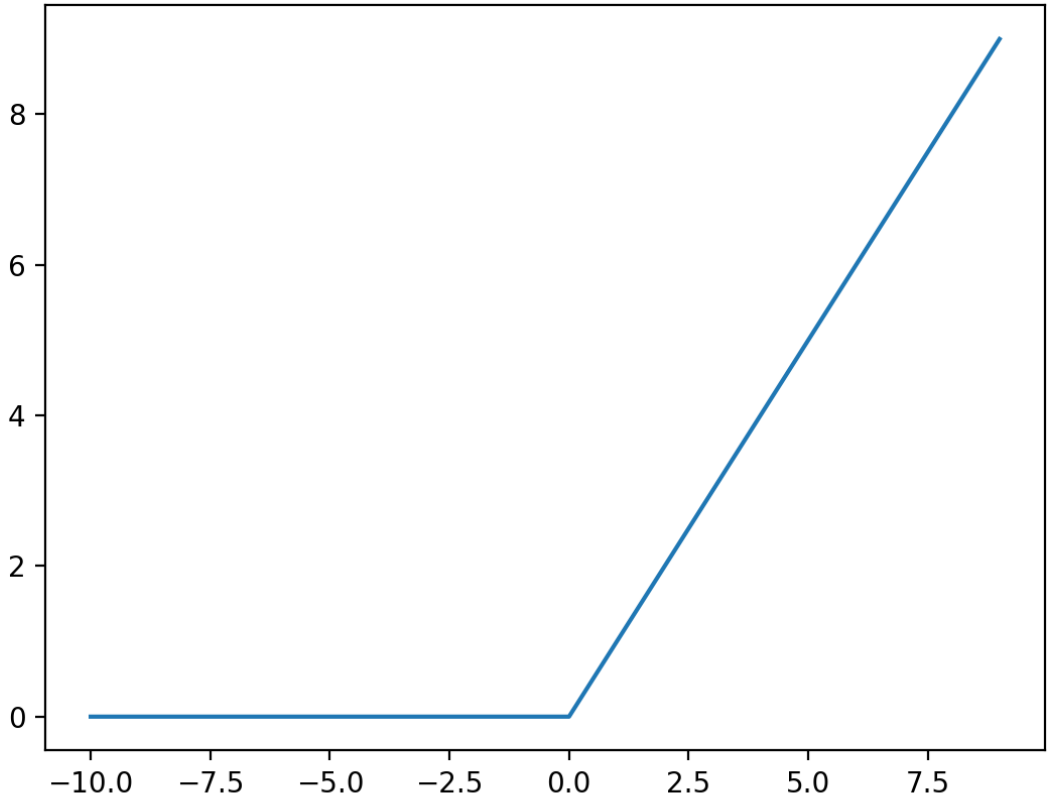


$$y = f(o_{11} * w_{21} + o_{12} * w_{22} + o_{13} * w_{23} + b_{21}) = f(O^{\mathrm{T}}W + b_{21})$$

$$O = \begin{bmatrix} o_{11} \\ o_{12} \\ o_{13} \end{bmatrix} \text{ and } \mathrm{W} = \begin{bmatrix} w_{21} \\ w_{22} \\ w_{23} \end{bmatrix}$$

f 非线性函数 non-linearity

$$ReLU(x) = \max(0, x)$$



假设神经元的输入、权重、偏置数据如下：

$$X = \begin{bmatrix} 0.1 \\ 0.2 \\ 0.3 \end{bmatrix} \quad \mathrm{W} = \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix} \quad b = 0.3 \quad f(x) = ReLU$$

$$\begin{aligned} y &= f(X^T W + b) \\ &= f(0.1 * 1 + 0.2 * 2 + 0.3 * 3 + 0.3) \\ &= f(0.8) \\ &= 0.8 \end{aligned}$$

Reference

- MIT 6.S191 Introduction to Deep Learning
  http://introtodeeplearning.com
- CS231n: Convolutional Neural Networks for Visual Recognition
  https://cs231n.github.io
- Neural Network 画图
  http://alexlenail.me/NN-SVG/index.html