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0.1 Introduction

- the sigmoid function (or logistics)

$$\phi(x) = \frac{1}{1 + exp(-x)}.$$

- The hyperbolic tangent function ("tanh")

$$\phi(x) = \frac{exp(x) - exp(-x)}{exp(x) + exp(-x)} = \frac{exp(2x) - 1}{exp(2x) + 1}$$

- the hard threshold function

$$\phi_\beta(x) = 1_{x \geq \beta}$$

- The Rectified Linear Unit (ReLU) activation function

$$\phi(x) = max(0, x).$$

- Here is schematic representation of an artficial neuron where $\sum = wj, x$