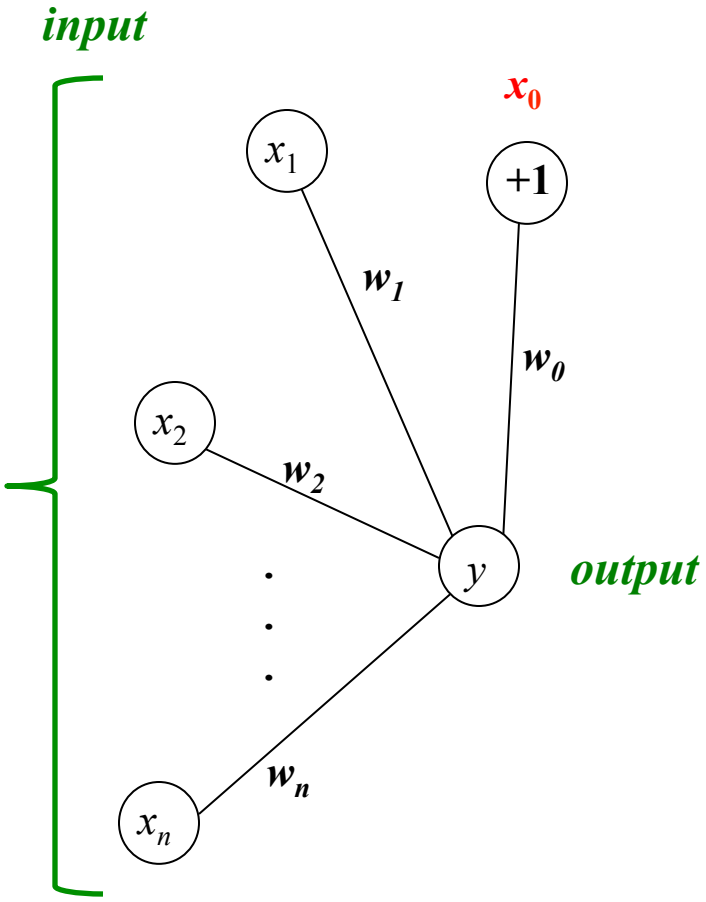
Perceptrons as simplified "neurons"

w_0 is called the "**bias**"

$-w_0$ is called the "**threshold**"



Input is $(x_1, x_2, \ldots x_n)$

Weights are $(w_1, w_2, \ldots w_n)$

Output y is +1 ("the neuron fires") if the sum of the inputs times the weights is greater or equal to the threshold:

$$If\ w_1x_1 + w_2x_2 + \ldots + w_nx_n > threshold$$
$$then\ y = 1, else\ y = -1$$

$$If\ w_1x_1 + w_2x_2 + \ldots + w_nx_n > -w_0$$
$$then\ y = 1, else\ y = -1$$

$$If\ w_0 + w_1x_1 + w_2x_2 + \ldots + w_nx_n > 0$$
$$then\ y = 1, else\ y = -1$$

$$If\ w_0x_0 + w_1x_1 + w_2x_2 + \ldots + w_nx_n > 0$$
$$then\ y = 1, else\ y = -1$$