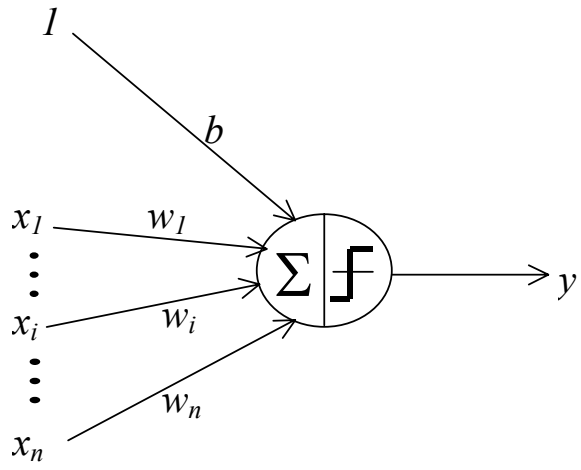
Training a simple Perceptron

Taken from "Fundamentals of Neural Networks" by L. Fausett.



Step 0. Initialize weights and bias.
(For simplicity, set weights and bias to zero.)

Set learning rate α ($0 < \alpha \leq 1$) .
(For simplicity, α can be set to 1.)

Step 1. While stopping condition is false, do Steps 2-6.

Step 2. For each training pair **s:t**, do Steps 3-5.

Step 3. Set activations of input units:

$x_i = s_i$.

Step 4. Compute response of output unit:

$$y\_in = b + \sum_i x_i w_i \ ;$$

$$y = \begin{cases} 1 \text{ if } y\_in \geq 0 \\ -1 \text{ if } y\_in < 0 \end{cases}$$

Step 5. Update weights and bias if an error occurred for this pattern.

If $y \neq t$,

$w_i(\text{new}) = w_i(\text{old}) + \alpha t x_i$

$b(\text{new}) = b(\text{old}) + \alpha t$

else

$w_i(\text{new}) = w_i(\text{old})$

$b(\text{new}) = b(\text{old})$

Step 6. Test stopping condition:
If no weights changed in Step 2, stop; else, continue.