📑 Perceptron Pseudocode

The goal of your perceptron algorithm is to obtain a weight vector w that will define a hyperplane that will separate the data. To do so, you must write code that will find such a hyperplane. Below, you will find pseudocode that illustrates the steps necessary to accomplish the task of finding such a hyperplane.

Pseudocode

$\textbf{procedure } \text{PERCEPTRON}(D = \{(\mathbf{x}_i, y_i)\}_{i=1}^{n}) \quad \triangleright \text{ Given a dataset } D$

$\quad \mathbf{w} \leftarrow 0 \qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad \triangleright \text{ Ini}$

$\quad \text{iter} \leftarrow 0$

$\quad \textbf{while } \text{TRUE } \textbf{do}$

$\qquad \text{iter} \leftarrow \text{iter} + 1 \qquad\qquad\qquad\qquad\qquad\qquad\qquad \triangleright$

$\qquad m \leftarrow 0 \qquad\qquad\qquad\qquad\qquad\qquad \triangleright \text{ Count the numb}$

$\qquad \textbf{for } (\mathbf{x}_i, y_i) \in D \textbf{ do} \qquad\qquad\qquad \triangleright \text{ Loop over}$

$\qquad\quad \textbf{if } y_i \left(\mathbf{w}^\top \mathbf{x}_i\right) \leq 0 \textbf{ then} \qquad \triangleright \text{ If the pair}$

$\qquad\qquad \mathbf{w} \leftarrow \mathbf{w} + y_i \mathbf{x}_i \qquad\qquad\qquad\qquad \triangleright \text{ U}$

$\qquad\qquad m \leftarrow m + 1 \qquad\qquad\qquad \triangleright \text{ Update the m}$

$\qquad \textbf{if } m = 0 \textbf{ then} \qquad\qquad \triangleright \text{ If } \mathbf{w} \text{ from before the for-loop g}$

$\qquad\qquad \text{break} \qquad\qquad\qquad\qquad \triangleright \text{ Training complete! Brea}$

$\qquad \textbf{else if } \text{iter} = \textbf{max then} \qquad \triangleright \text{ If iteration count is equal}$

$\qquad\qquad \text{break} \qquad\qquad\qquad \triangleright \text{ Convergence not met. Brea}$

$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad \triangleright \text{ C}$

$\quad \textbf{return } \mathbf{w}$