GRADIENT_DESCENT $\left(\text{training\_examples}, \ \eta\right)$:

** *where, training_examples* $= \left(\left(\vec{x}, \ t\right)_1, \ \left(\vec{x}, \ t\right)_2, \ \ldots, \ \left(\vec{x}, \ t\right)_N \right)$

** $\vec{x}_i = (x_1, \ x_2, \ \ldots, \ x_n)_i$

** $\vec{w} = (w_1, \ w_2, \ \ldots, \ w_n)$

1. $\vec{w} \longleftarrow$ Initialize with small random values
2. Until the termination condition is met, Do :

    $\triangle w_i = 0$

    For each $\left(\vec{x}, \ t\right)_i$ in training_examples, Do :

        $f_i \longleftarrow \vec{w} \cdot \vec{x}_i$

        For each weight w_k, Do :

            $\triangle w_k \longleftarrow \triangle w_k + \ \eta \left(t_i - f_i\right) \ x_k$

    For each weight w_i, Do :

        $w_i \longleftarrow w_i + \triangle w_i$
3. Return w