

## Exercise 1 :

Minimize the mean square error of single regression by the steepest descent method

$$E(w) = \frac{1}{N} \sum_{i=1}^N (t_i - (wx_i + b))^2$$

1. Find the derivative of the mean squared error  $E(w)$  with parameters  $w$  and  $b$ .
2. Find the update equation for Step 2 of the Steepest Descent Method. Let the initial parameters be  $(w_0, b_0)$ , the  $t$ -th update parameters be  $(w_t, b_t)$ , and the step size parameter be  $\eta$ .