

MIL.

ADAGRAD.

$$x_{t+1} = x_t - \eta \frac{\partial L}{\partial x}$$

$$x_{t+1} = x_t - \frac{x}{\sqrt{G_x^2 + \epsilon}} \frac{\partial L}{\partial m}$$

Step-1: Read $\{x, y\}$, $\eta = 0.1$, $m = 1$, $c = -1$

$$G_m^2 = 0, G_c^2 = 0, \text{epoch} = 1$$

Step-2: Iter = 1

Step-3: sample = 1

$$\text{Step-4: } g_m = -(y_i^a - m x_i^a - c) x_i^a$$

$$g_c = -(y_i^a - m x_i^a - c)$$

$$\text{Step-5: } G_m^2 = G_m^2 + [g_m]^2$$

$$G_c^2 = G_c^2 + [g_c]^2$$

$$\text{Step-6: } m = m - \frac{\eta}{\sqrt{G_m + \epsilon}} g_m$$

$$c = c - \frac{\eta}{\sqrt{G_c^2 + \epsilon}} g_c$$

Step-7 : $sample = sample + 1$

$$= 1 + 1$$

$$= 2$$

if $sample \leq n_s$ go to step 4

else go to next step

Step-8 : $iter = iter + 1$

$$= 1 + 1$$

$$= 2$$

if $iter \leq epochs$ go to step 3

else go to next step

Step-9: calculate RMSE, MAE, MSE using final m, c values.