02/02/2023

$$\frac{\lambda}{2}\|a\|^2$$

$$\hookrightarrow \frac{\lambda}{2}\langle \vec{a}, \vec{a} \rangle$$

$$\hookrightarrow \frac{\lambda}{2}(a_1 a_1 + a_2 a_2 + \dots + a_m a_m)$$

$$\nabla = \begin{bmatrix} \partial f / \partial a_1 \\ \partial f / \partial a_2 \\ \vdots \\ \partial f / \partial a_m \end{bmatrix} = \begin{bmatrix} \lambda a_1 \\ \lambda a_2 \\ \vdots \\ \lambda a_m \end{bmatrix} = \lambda \vec{a}$$

$$\max(0,\ 1 - y_i(\vec{a}^T\vec{x}_i + b))$$

assure $y_i(\vec{a}^T\vec{x}_i + b) \geq 1$

$\hookrightarrow \max(\text{mess}) \rightarrow 0$

$\hookrightarrow \vec{0}$

Assue $y_i(\vec{a}^T\vec{x}_i + b) < 1$

$$\hookrightarrow 1 - y_i(a^T\vec{x}_i + b)$$

$$1 - y_i b - y_i\vec{a}^T\vec{x}_i$$

$$\begin{array}{c} \partial f/\partial\vec{a} \\ \partial/\partial b = \end{array} \begin{bmatrix} -y_i\vec{x}_i \\ \hline -y_i \end{bmatrix}$$

$$b^{(n+1)} = b^{(n)} - \alpha \nabla$$

$$\vec{a}^{(n+1)} = \vec{a}^{(n)} - \alpha \nabla$$

if $y_i(\vec{a}^T x_i + b) \geq 1$

$$\nabla_a = \lambda \vec{a} + \vec{0}$$

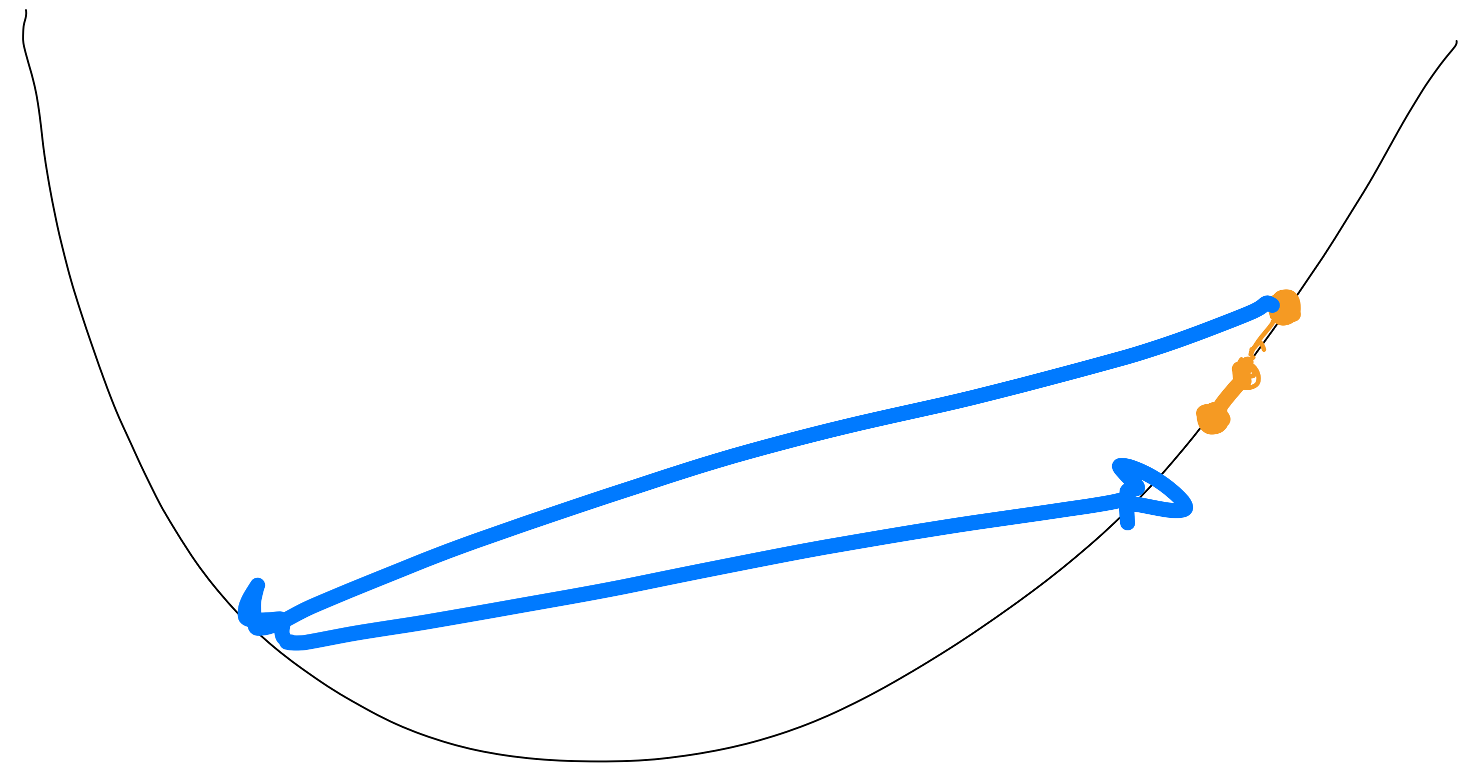
$$\nabla_b = 0$$

else

$$\nabla_a = \lambda a - y_i \vec{x}_i$$

$$\nabla_b = -y_i$$

$$\alpha^e = \frac{m}{enum + n}$$



$$\frac{1}{k + decay * iternum}$$