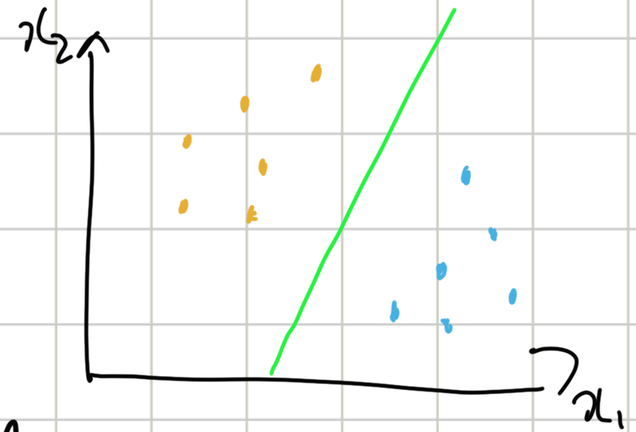
$$z = w_1 x_1 + w_2 x_2 + b$$ fonc° linéaire

$$a = \frac{1}{1+e^{-z}}$$ fonc° sigmoid



$$L = -\frac{1}{m}\sum_{i=1}^{m} y_i \log(a_i) + (1-y_i)\log(1-a_i)$$ fonc° de coût log-loss

$$W = W - \alpha \frac{\partial L}{\partial W}$$ algo descente de gradient.

$$b = b - \alpha \frac{\partial L}{\partial b}$$

- $$\frac{\partial L}{\partial w_1} = \frac{\partial L}{\partial a} \times \frac{\partial a}{\partial z} \times \frac{\partial z}{\partial w_1} = -\frac{1}{m}\sum\left(\frac{y}{a} - \frac{1-y}{1-a}\right) \times a(1-a)\, x_1$$

$$\frac{\partial L}{\partial w_1} = \frac{1}{m}\sum_{i=1}^{m}(a_i - y_i)\, x_1$$

- $\frac{\partial L}{\partial w_2} = \frac{\partial L}{\partial a} \times \frac{\partial a}{\partial z} \times \frac{\partial z}{\partial w_2} = \frac{1}{m} \sum_{i=1}^{m} (a_i - y_i) a_2$

- $\frac{\partial L}{\partial b} = \frac{1}{m} \Sigma (a - y)$

Deep neural network: