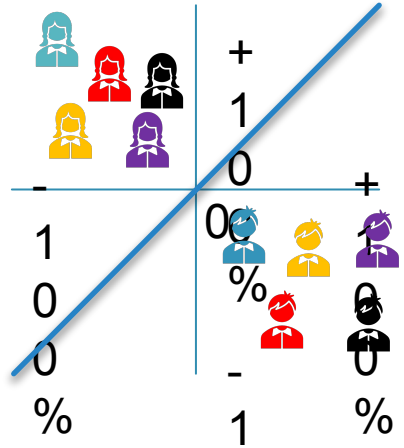
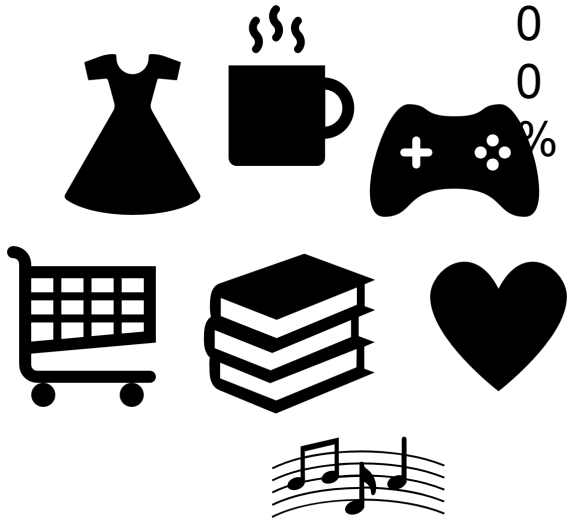
Въведение в Artificial Neural Network и Deep Learning

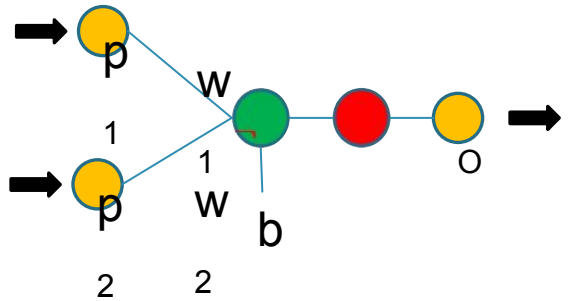
Тема 2 – Изкуствен неврон

ХАРАКТЕРИСТИКИ





1.Брой покупки
2.Книги
3.Музика
4.Кафе
5.Дължина на косата
6.Тегло
…….



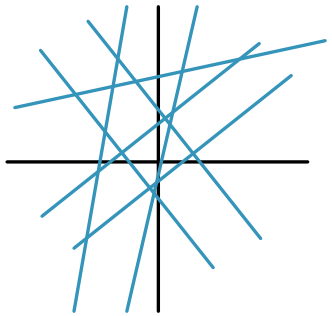
$p_1, p_2, p_3, \ldots p_n$

КЛАСОВЕ


Момиче / момче

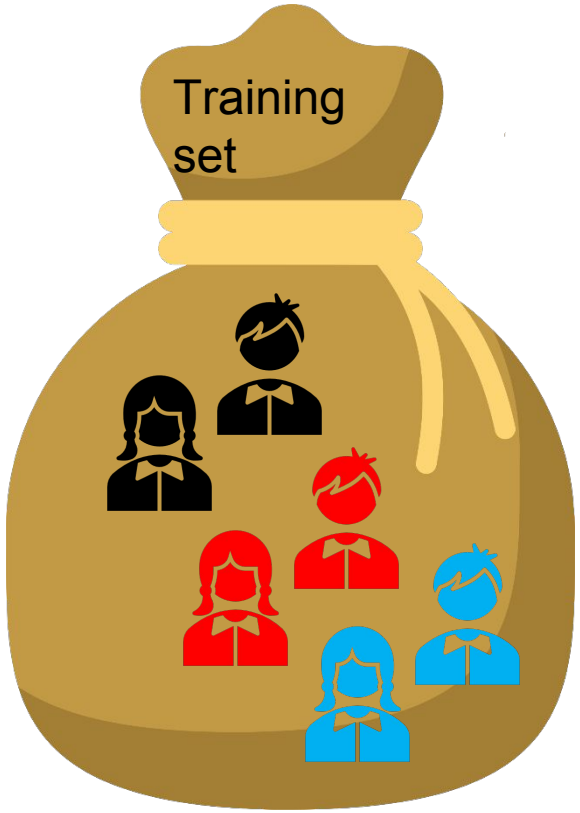
0 или 1

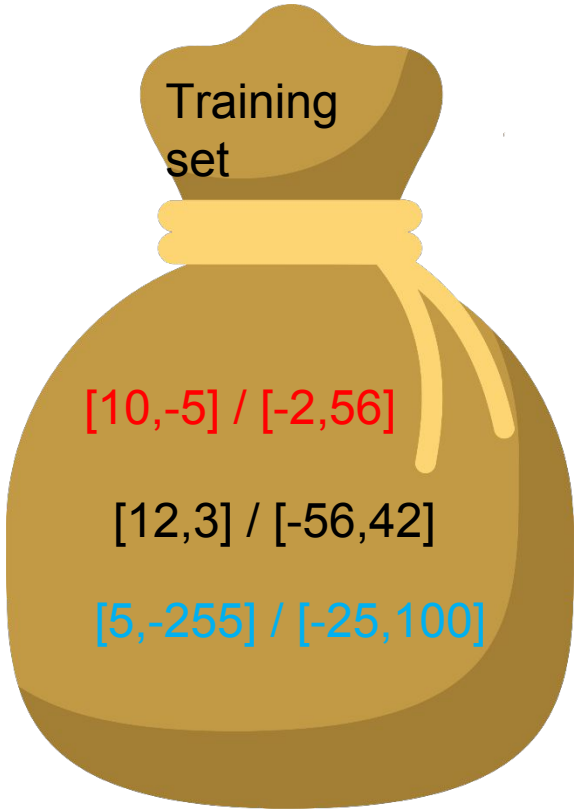
ОБУЧЕНИЕ



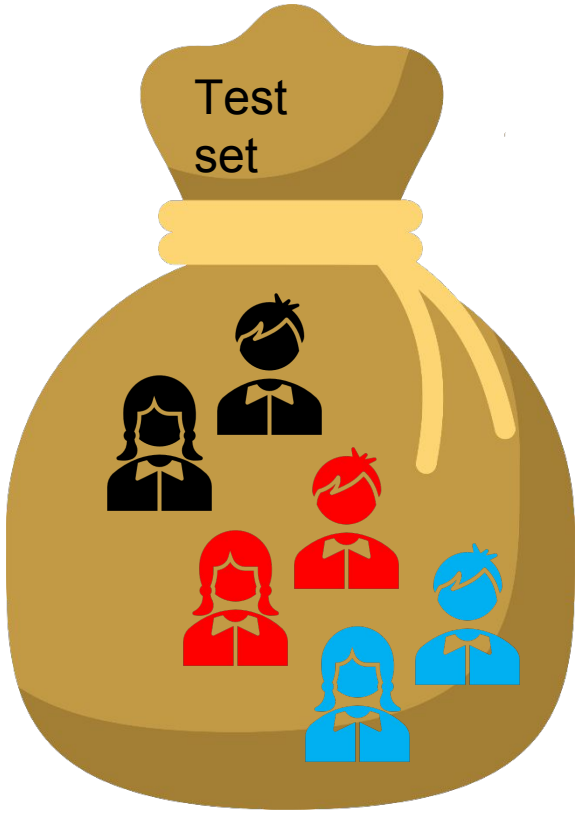
$w_1 = ?$
$w_2 = ?$
…
$b = ?$

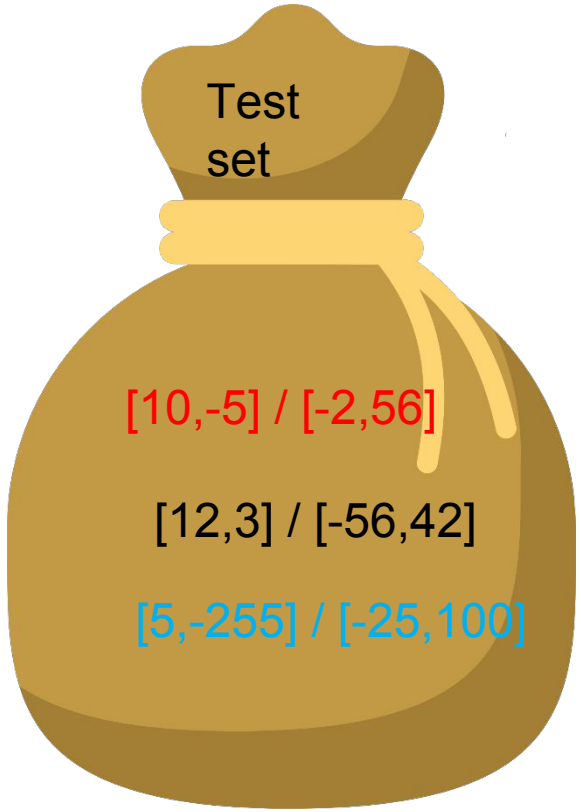
Training samples

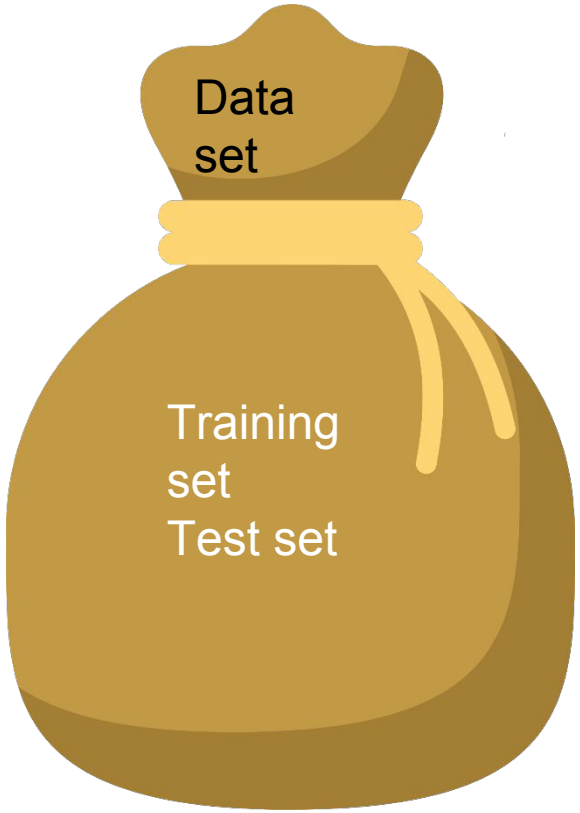


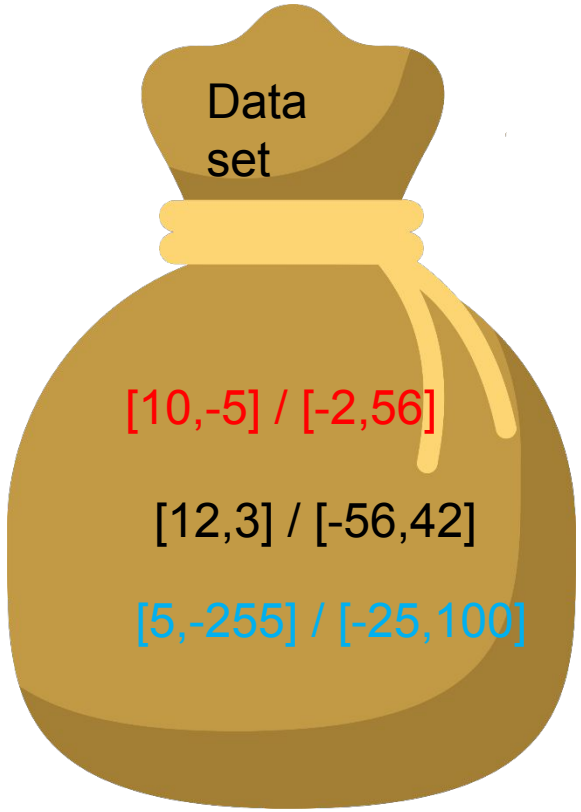


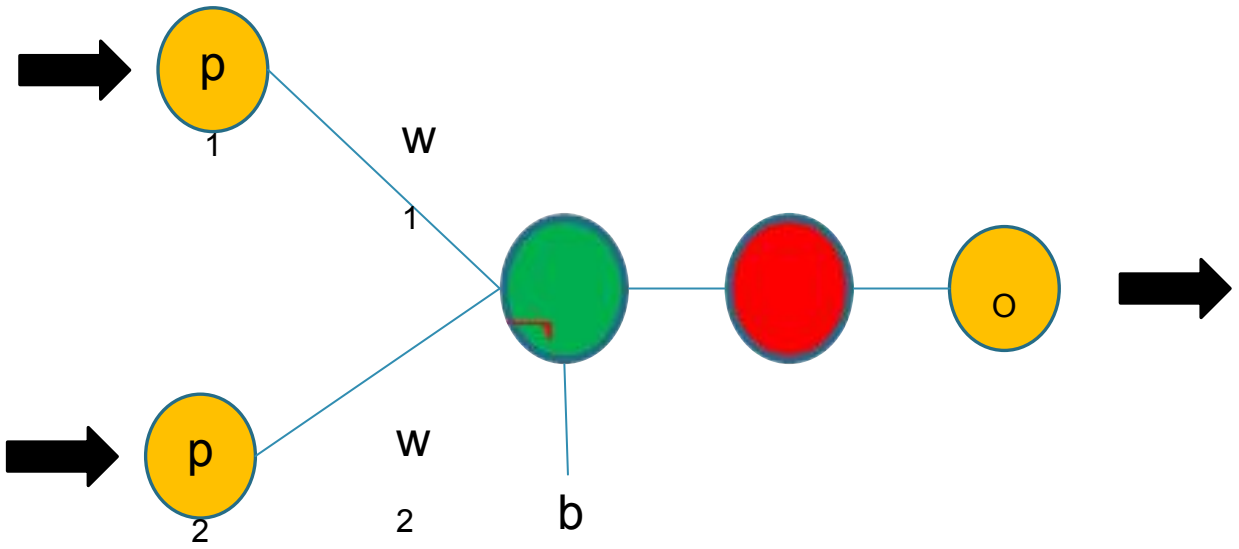
Test samples





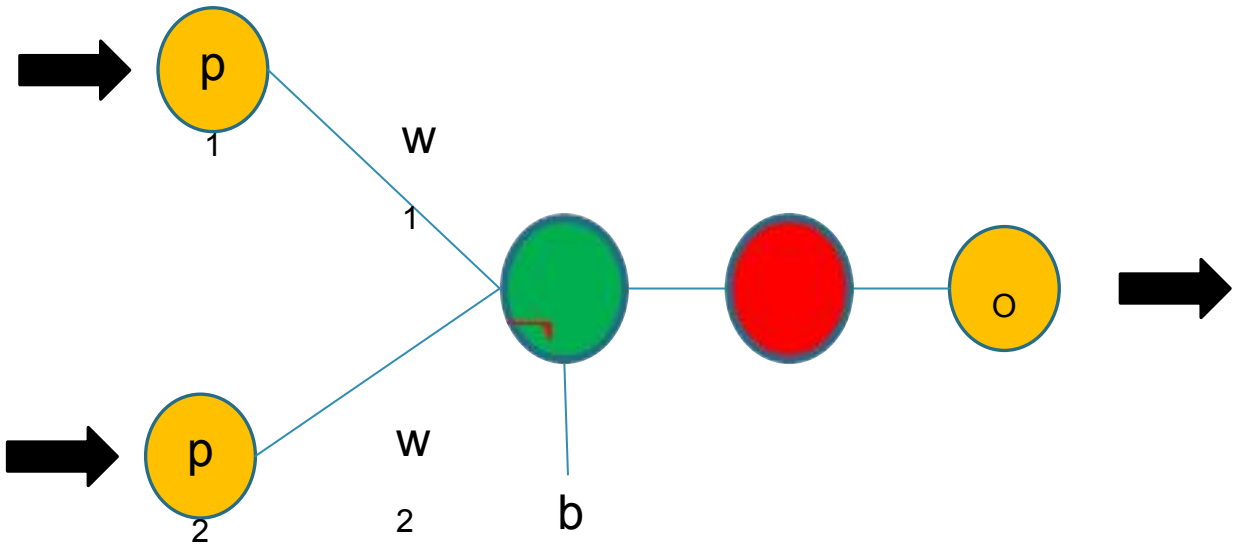

Data
set
Training
set
Test set


Data
set
[10,-5] / [-2,56]
[12,3] / [-56,42]
[5,-255] / [-25,100]



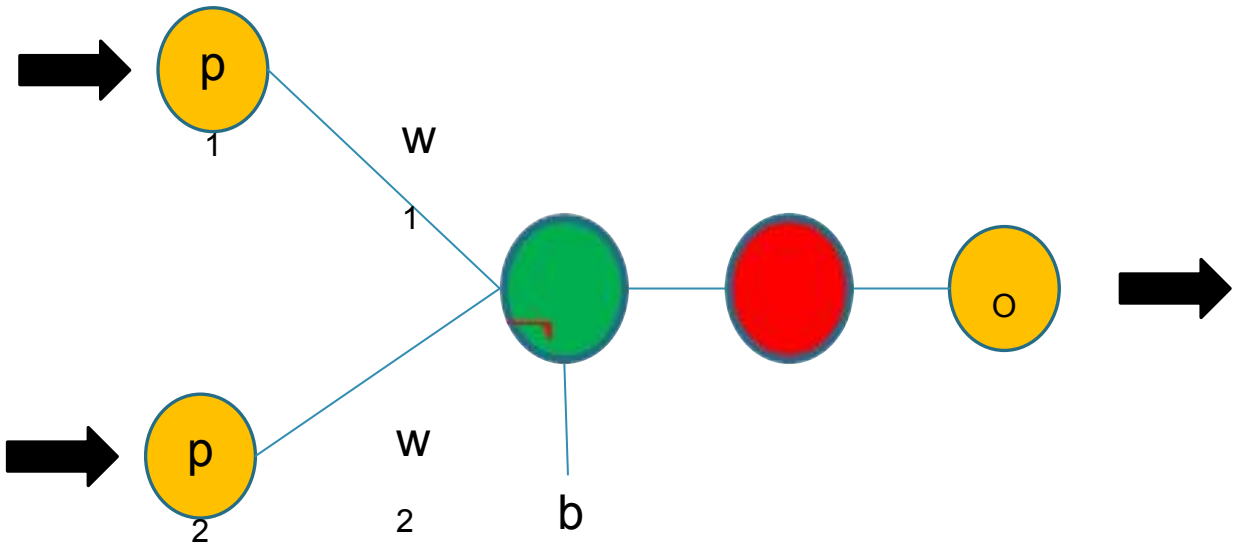
Weights or connection weights

W1,W2, … Wn



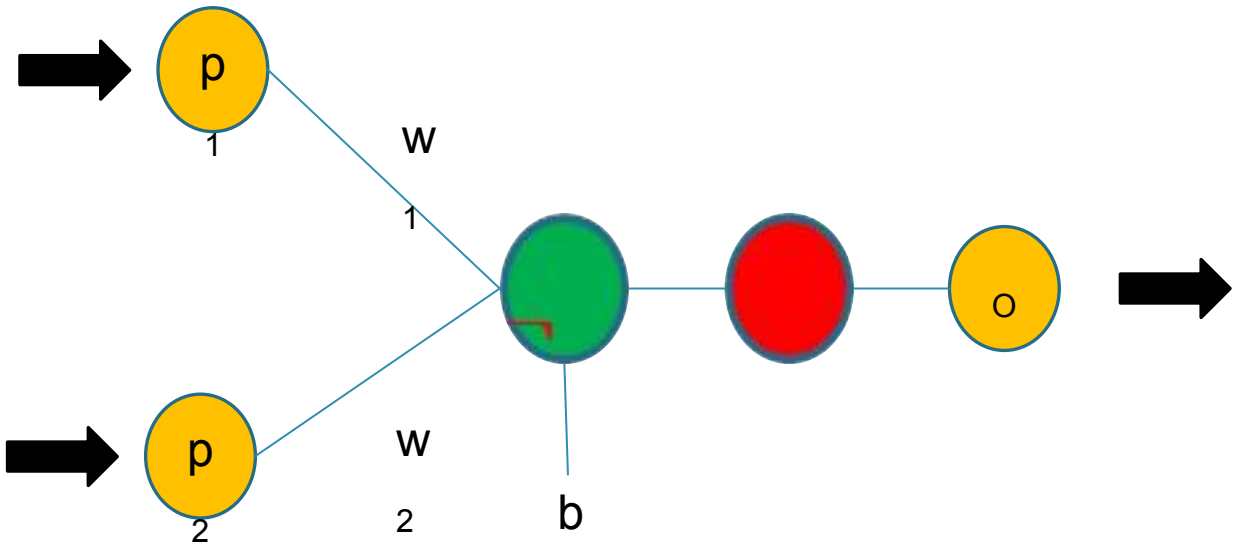
bias

b



Summation unit

$p1w1+p2w2+\ldots+p_nw_n$

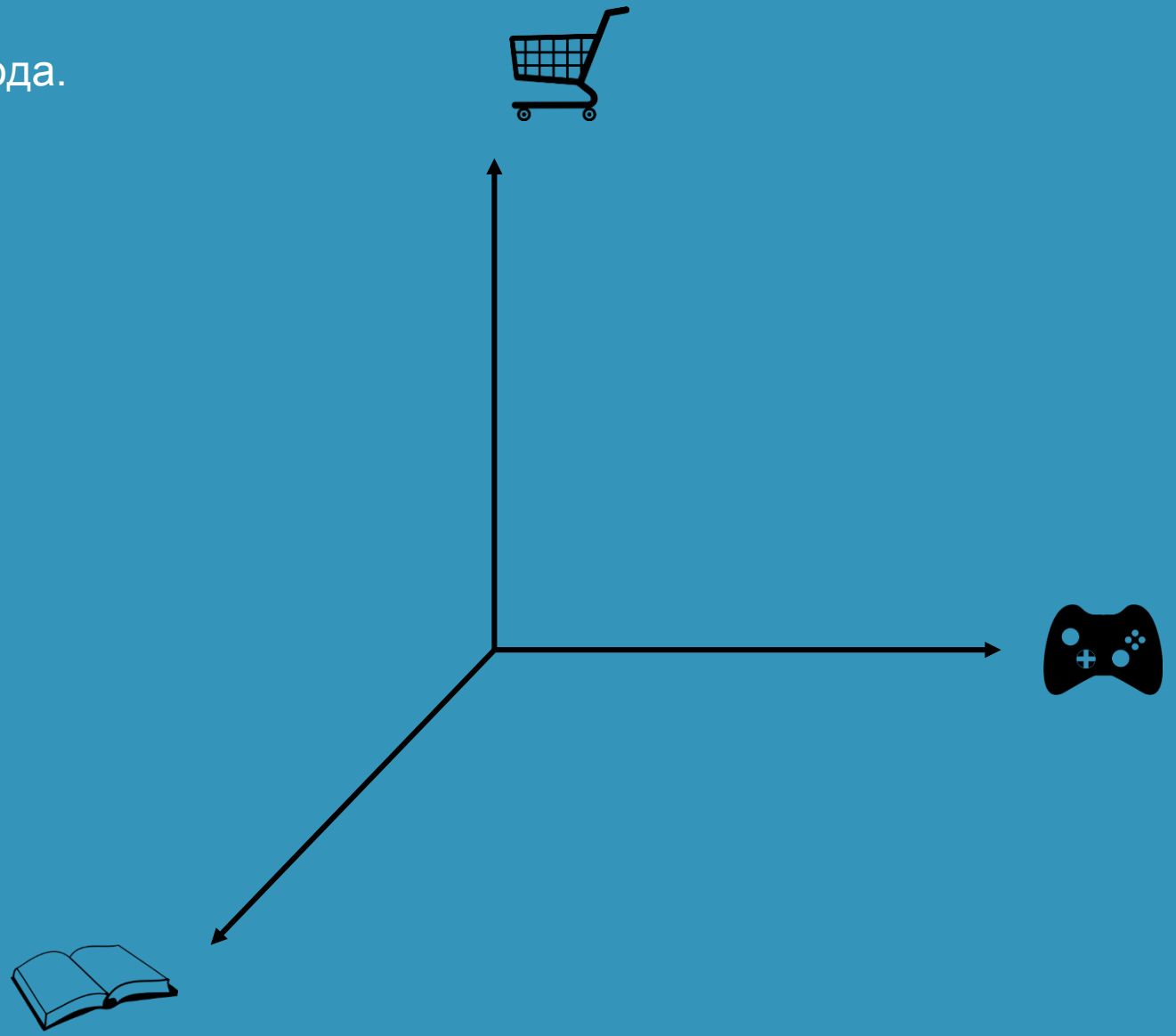


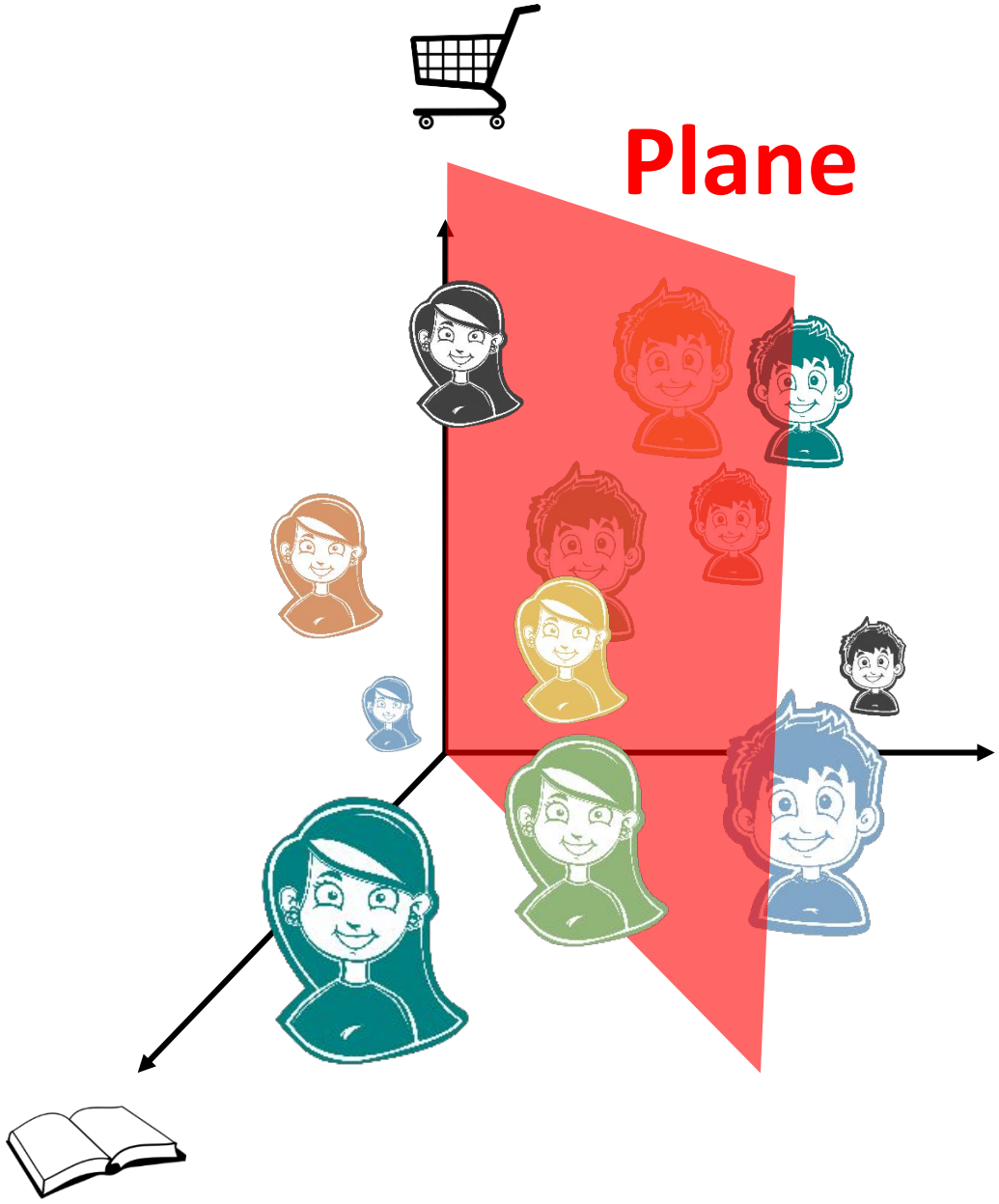
Activation (transfer) function

$$f(p1,p2) = \begin{cases} 1 & p1w1 + p2w2 + b > 0 \\ 0 & p1w1 + p2w2 + b < 0 \end{cases}$$

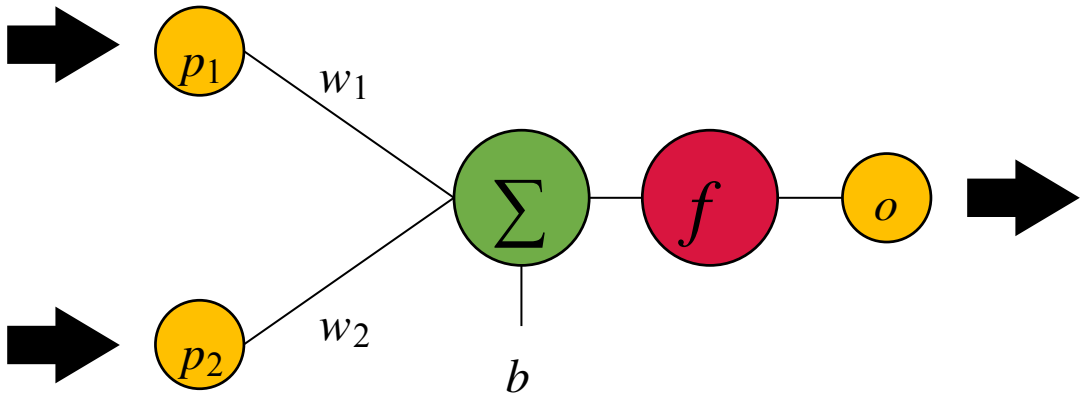
Какво ще се случи при повече от 2 характеристики?

Неврон с повече от два входа.

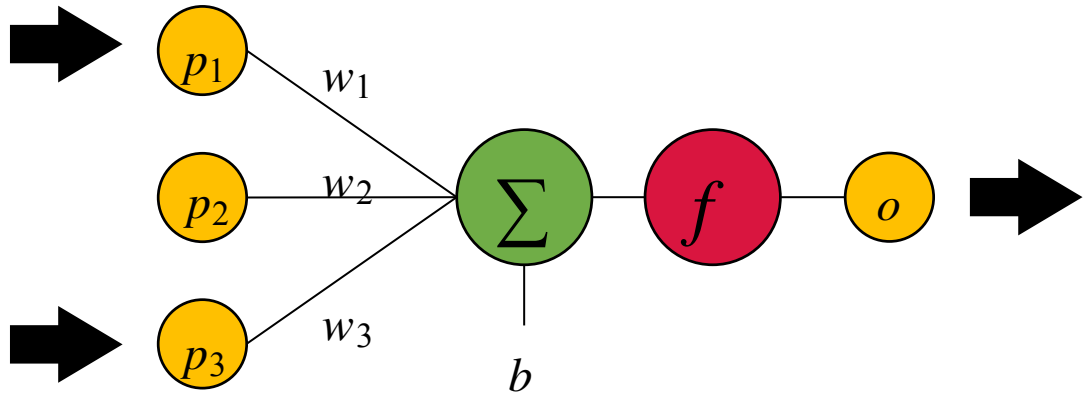




$$f(p1,p2,p3) = \begin{cases} 1 & p1w1 + p2w2 + p3w3 + b > 0 \\ 0 & p1w1 + p2w2 + p3w3 + b < 0 \end{cases}$$

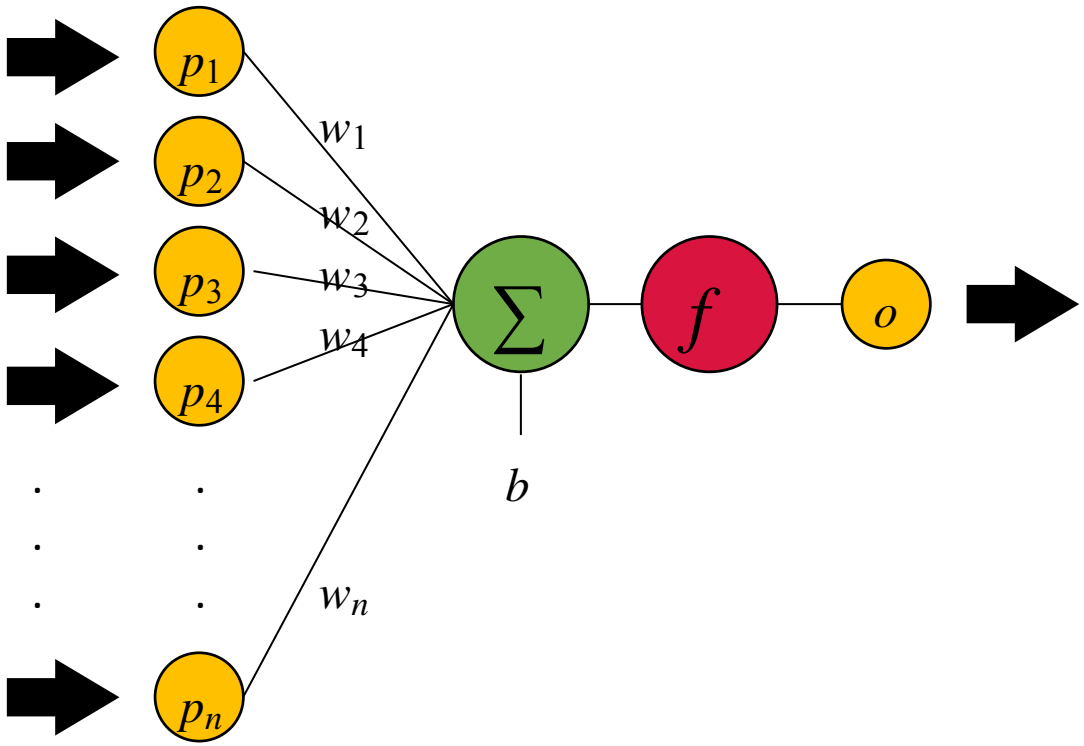


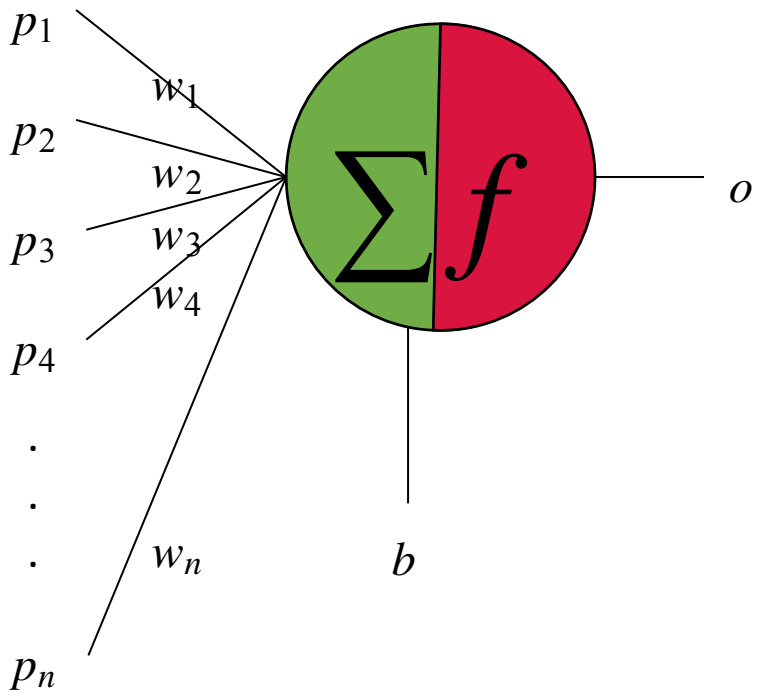
$$f(p1,p2)=\begin{cases}1 & p1w1+p2w2+b>0\\ 0 & p1w1+p2w2+b<0\end{cases}$$



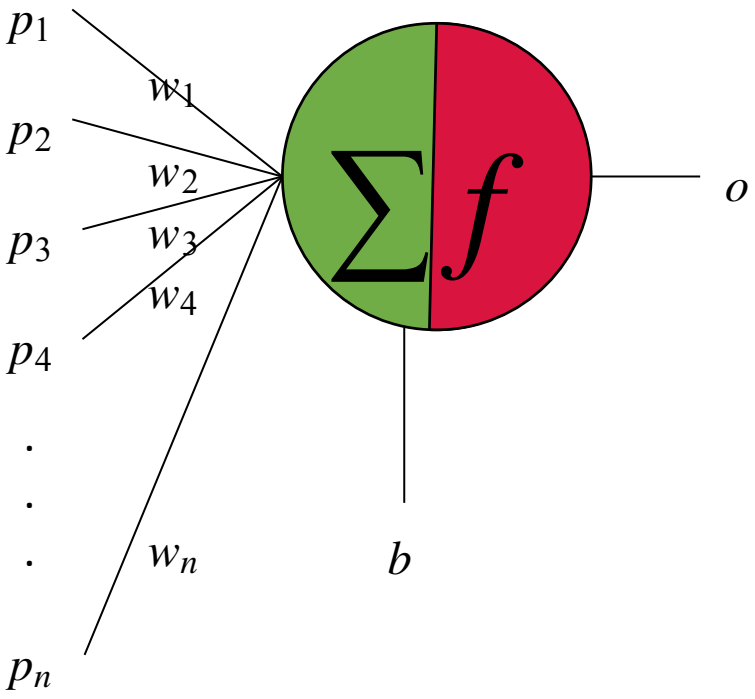
$$f(p1,p2,p3)=\begin{cases}1 & p1w1+p2w2+p3w3+b>0\\ 0 & p1w1+p2w2+p3w3+b<0\end{cases}$$

$$O = (p_1 + p_2 + \ldots + p_n + b) = f\left(\left(\sum_{k=1}^{n} p_k * w_k\right) + b\right)$$



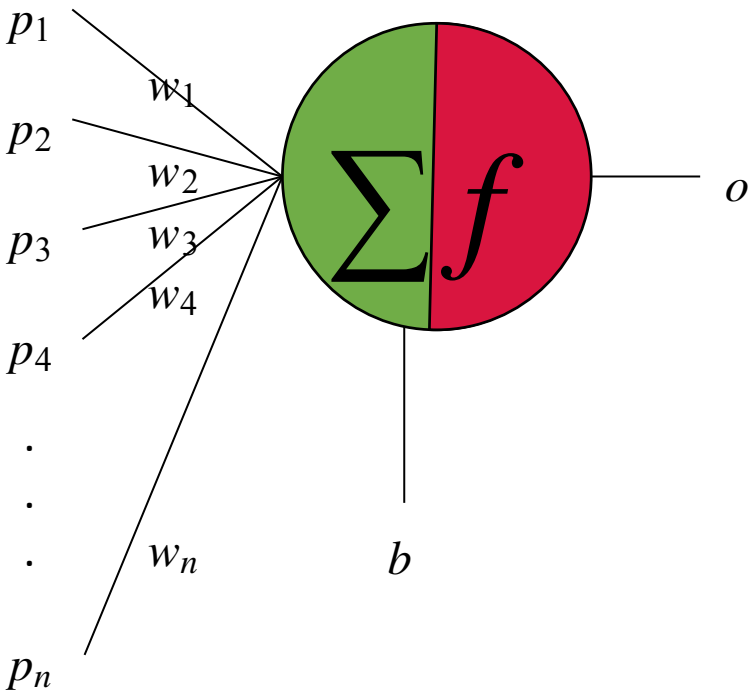


$$O = f\left(\left(\sum_{k=1}^{n} p_k * w_k\right) + b\right)$$

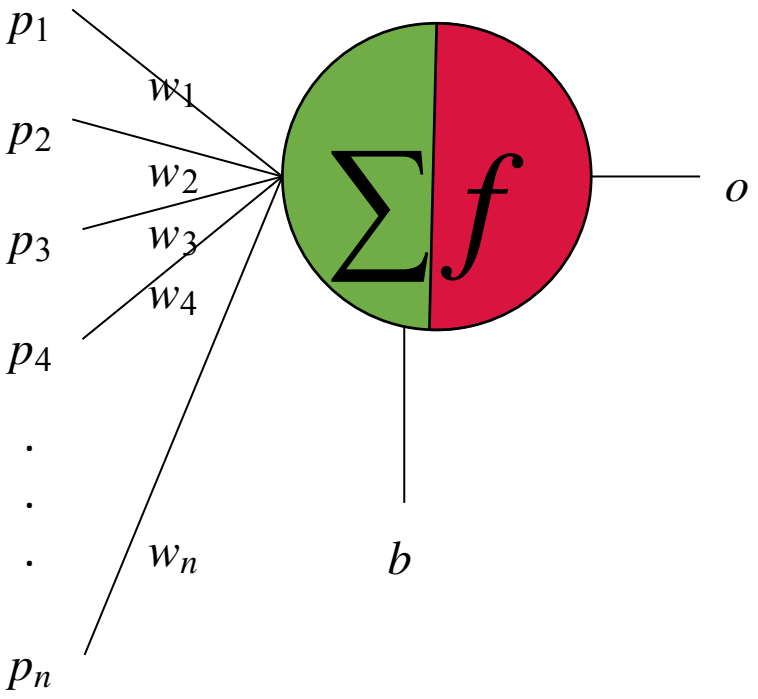


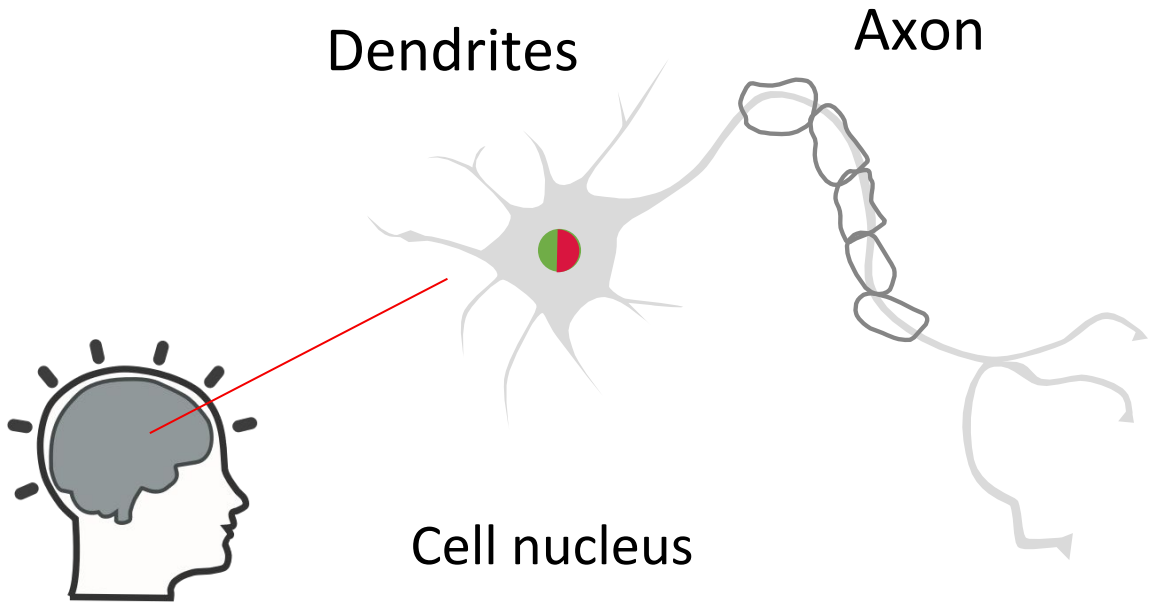
Вдъхновение от естествения неврон

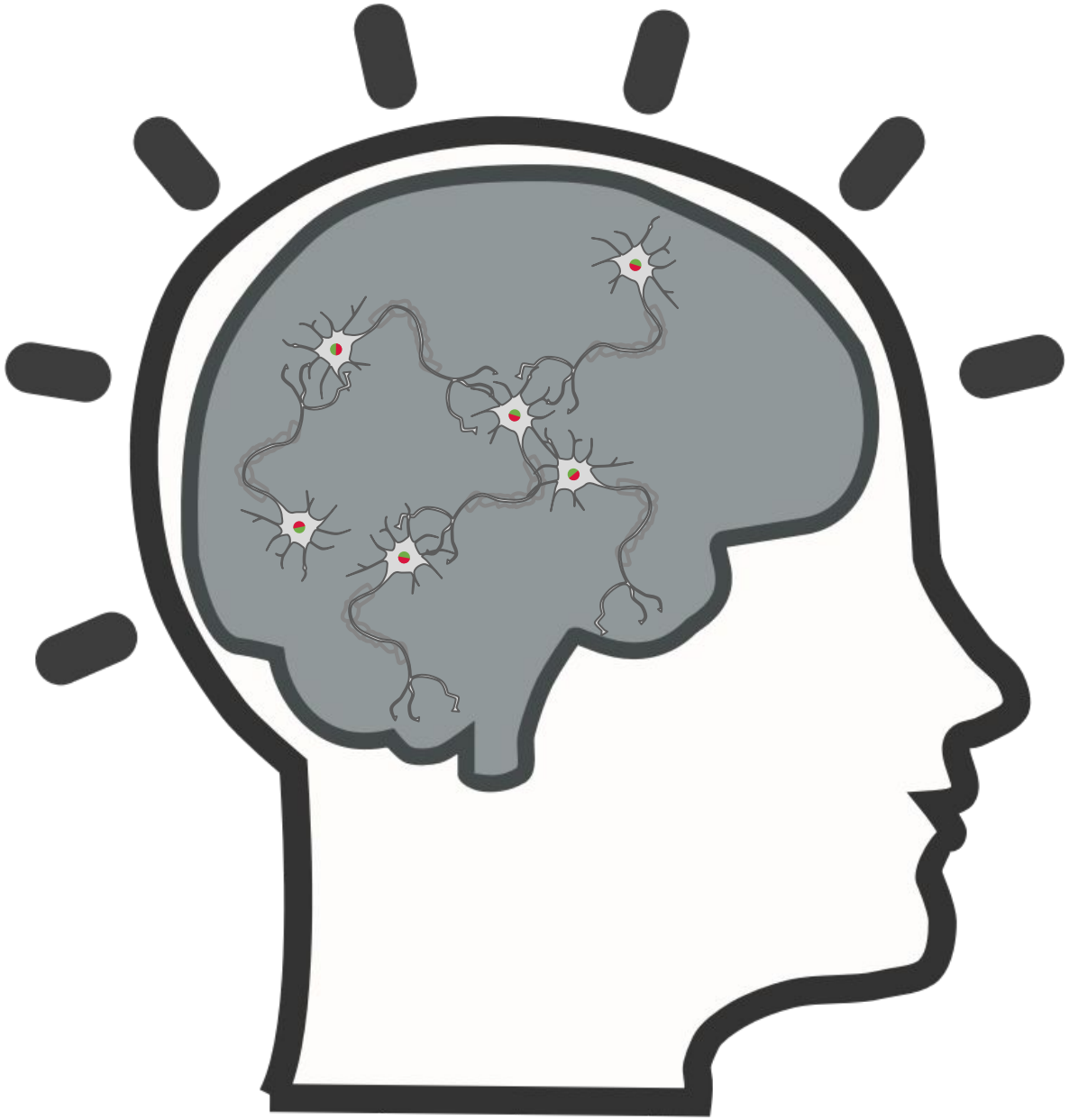
$$O = f\left(\left(\sum_{k=1}^{n} p_k * w_k\right) + b\right)$$



$$O = f\left(\left(\sum_{k=1}^{n} p_k * w_k\right) + b\right)$$







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