

Overview of **PERCEPTRON**

1. Perceptron definition
 2. Perceptron intuition with an analogy.
 3. Mathematical representation
 4. Perceptron weight update rule
Perceptron learning rule
- Frequently used terms for deep learning

1) It was invented by Frank Rosenblatt in 1957

paper :-

"The perceptron: A probabilistic Model for Information Storage & Organisation in the Brain"

different from first neuron.

i/p = binary

The Perceptron: idea

LTU → Linear Threshold Unit

TLU → Threshold Logic Unit

Task: Make a good of my tea

binary classification good / bad

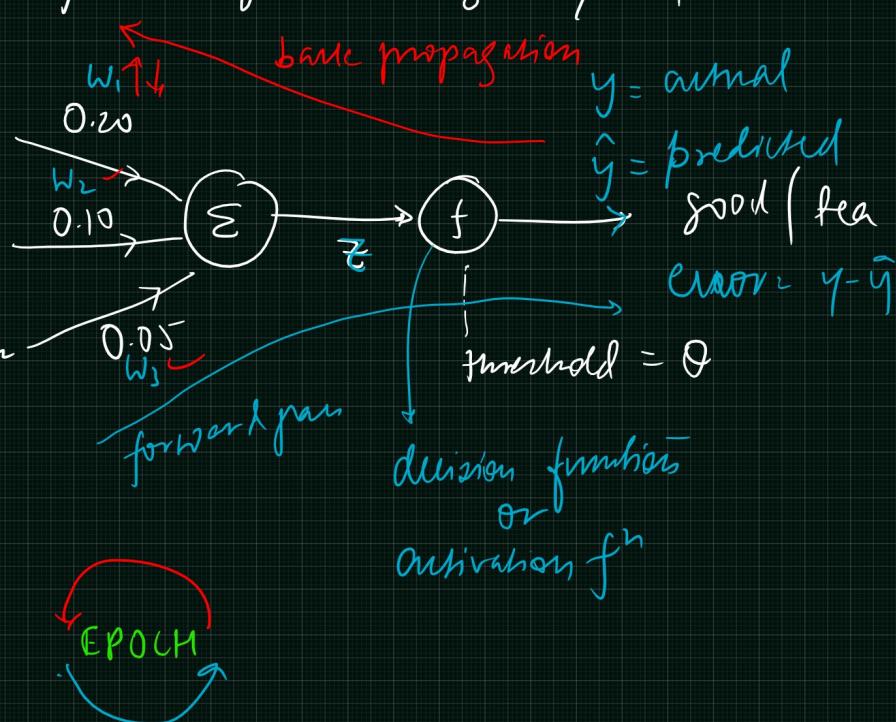
Milk Tea Sugar

→ n₁ 1L 1kg 1kg

→ n₂ 1L Milk

→ n₃ 1kg Tea

→ n₄ 1kg Sugar



$$z = w_1 n_1 + w_2 n_2 + w_3 n_3$$

$$\hat{y} = f(z)$$

$$\text{error} = y - \hat{y}$$

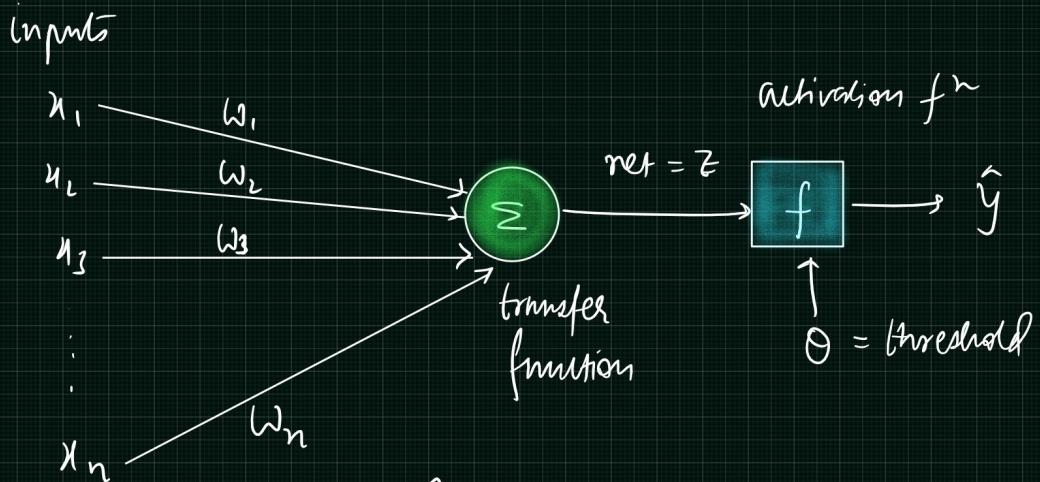
Perceptron
Weight
update
rule

$$\omega_{\text{new}} = \omega_{\text{old}} + \eta \underbrace{\text{error} \cdot x}_{\Delta \omega}$$

$$\begin{aligned}\omega_1 &= \omega_1 + \eta (y - \hat{y}) \cdot x_1 \\ \omega_2 &\\ \omega_3 &\end{aligned}$$

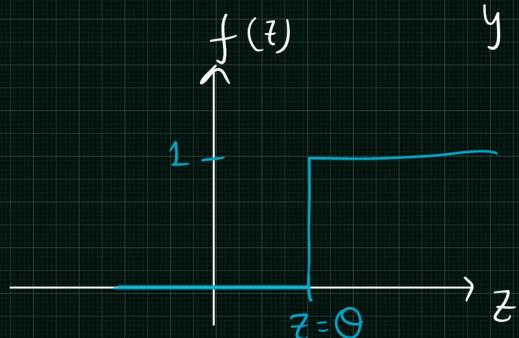
$\eta \rightarrow \text{learning rate}$
 $0 \rightarrow 1$

$$f(z) = \begin{cases} 0 & z < 0 \\ 1 & z \geq 0 \end{cases}$$



$$z = \sum_{i=1}^n w_i x_i$$

$$\hat{y} = f(z) = \begin{cases} 0 & z < \theta \\ 1 & z \geq \theta \end{cases}$$



$$\text{error} = y - \hat{y}$$

$$\omega_{\text{new}} = \omega_{\text{old}} + \eta \text{ error} \cdot x$$