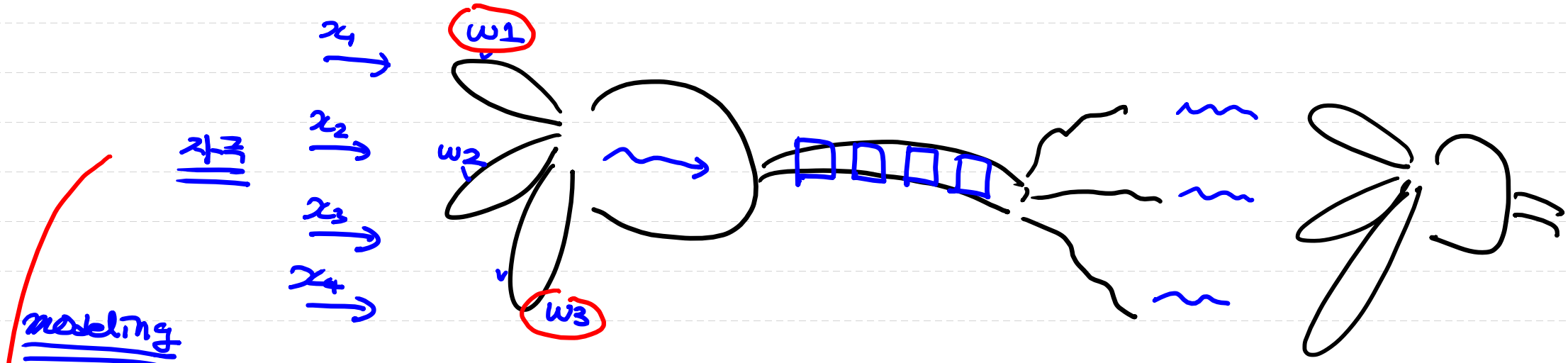
• 04/11

• Deep Learning

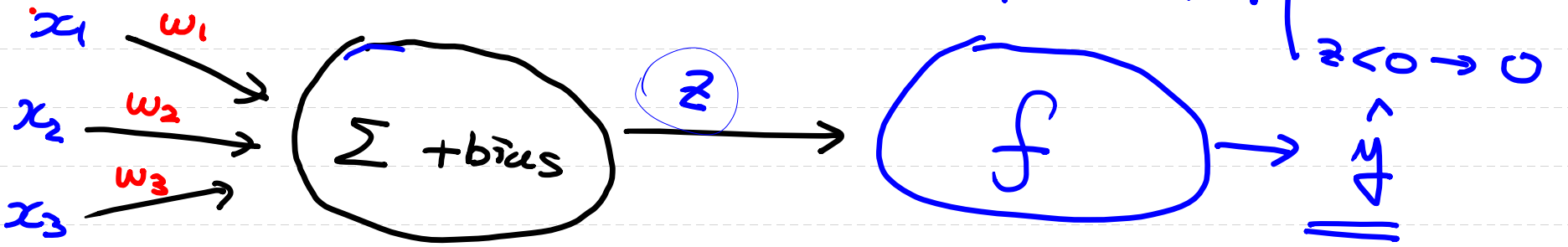
NN (Neural Network) [신경망]

★ ANN (Artificial Neural Network)



modeling

★ Perceptron



Step function $\begin{cases} z \geq 0 \rightarrow 1 \\ z < 0 \rightarrow 0 \end{cases}$

* perceptron → Neuron 1개

perceptron → 여러개

Neuron → 여러개 → "사고"(생각)

학습

- AND v
- OR v
- NOR v
- OXR v
- ⋮

→ 생각하는 CPU

구현해보자 * perceptron

X

- AND
- OR
- XOR
- NOR
- ⋮

학습 가능한가요?

AND Truth table

Input		output
A	B	AxB
0	0	0
0	1	0
1	0	0
1	1	1

OR Truth Table

Input		output
A	B	A+B
0	0	0
0	1	1
1	0	1
1	1	1

[AND, OR] 가능해요!!

→ Logistic Regression을 이용하여 "GATE 연산을 구현"

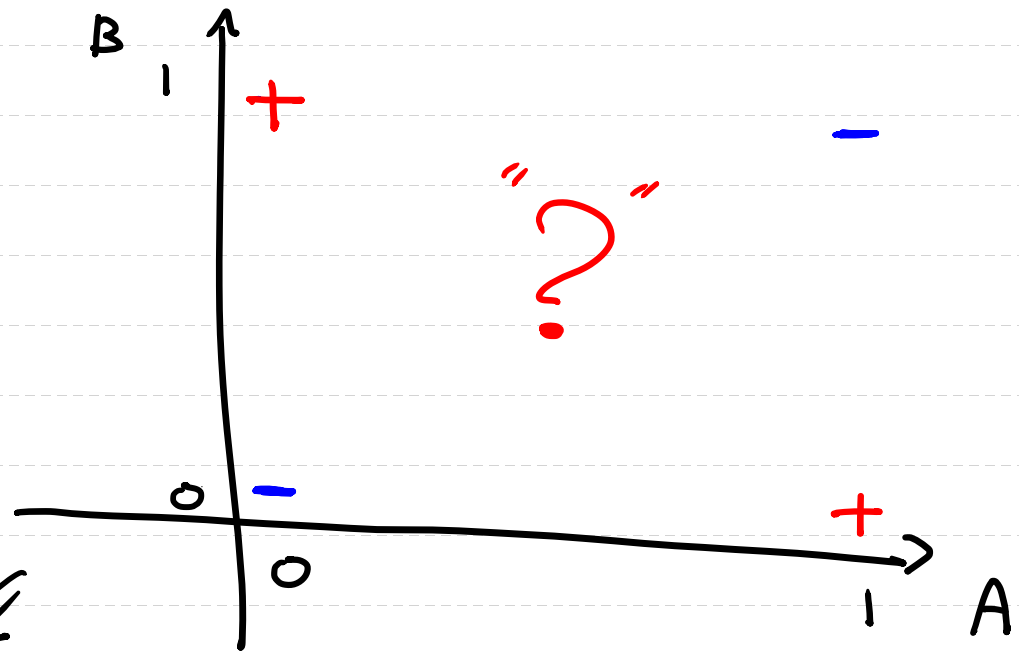
AND
OR
XOR

"Tensorflow 1.15 버전으로 구현"

Input		Output
A	B	A⊕B
0	0	0
0	1	1
1	0	1
1	1	0

XOR → (perceptron / logistic regression) 으로 구현이 (학습) 가능한가?

↓ 불가능



단층이요!!

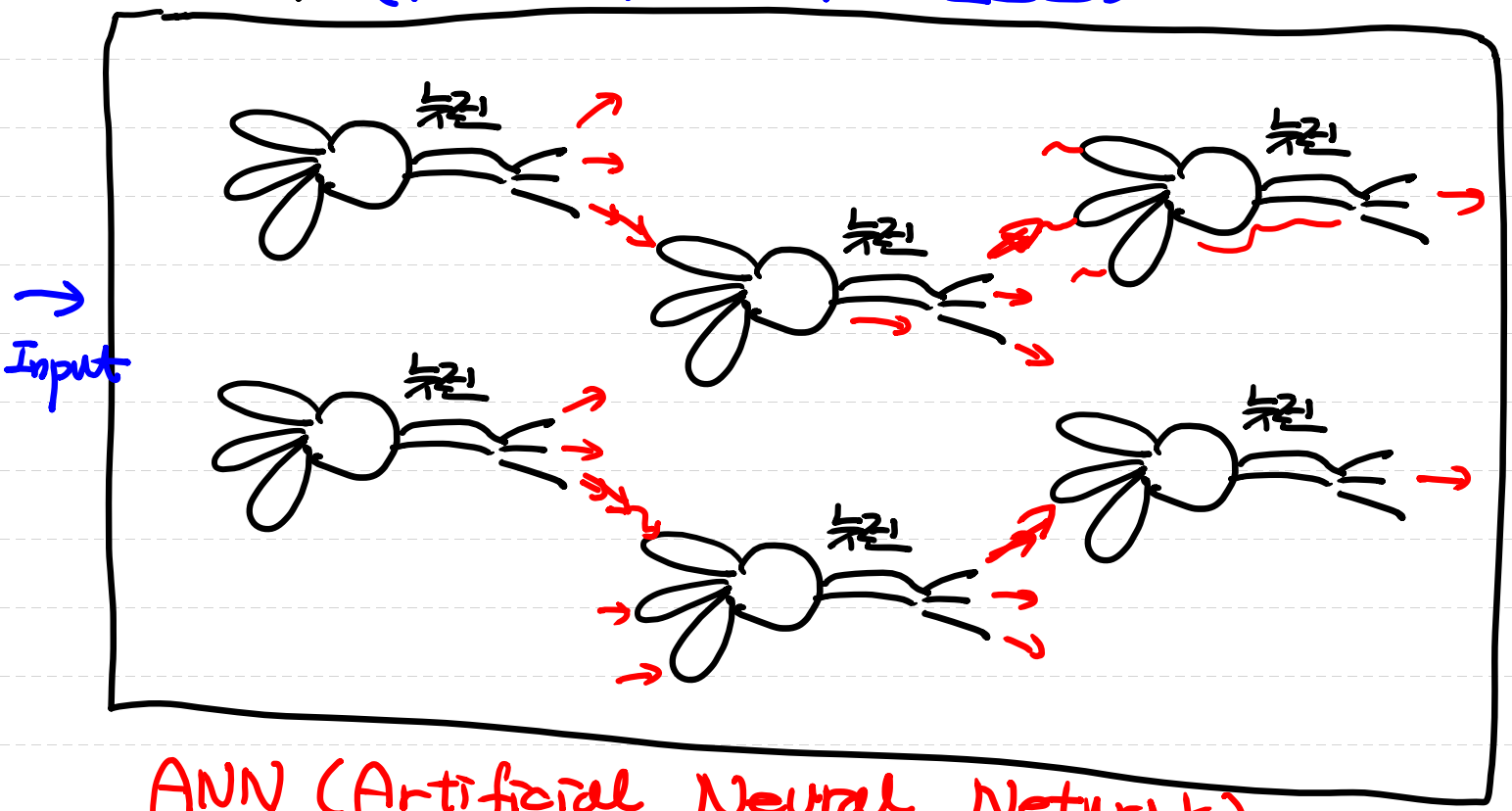
1차 함수인

어떻게하면 (perceptron / logistic) 으로 XOR를 학습을 할 수 있을까??

1969 → MIT AI Lab Founder (Marvin Minsky)

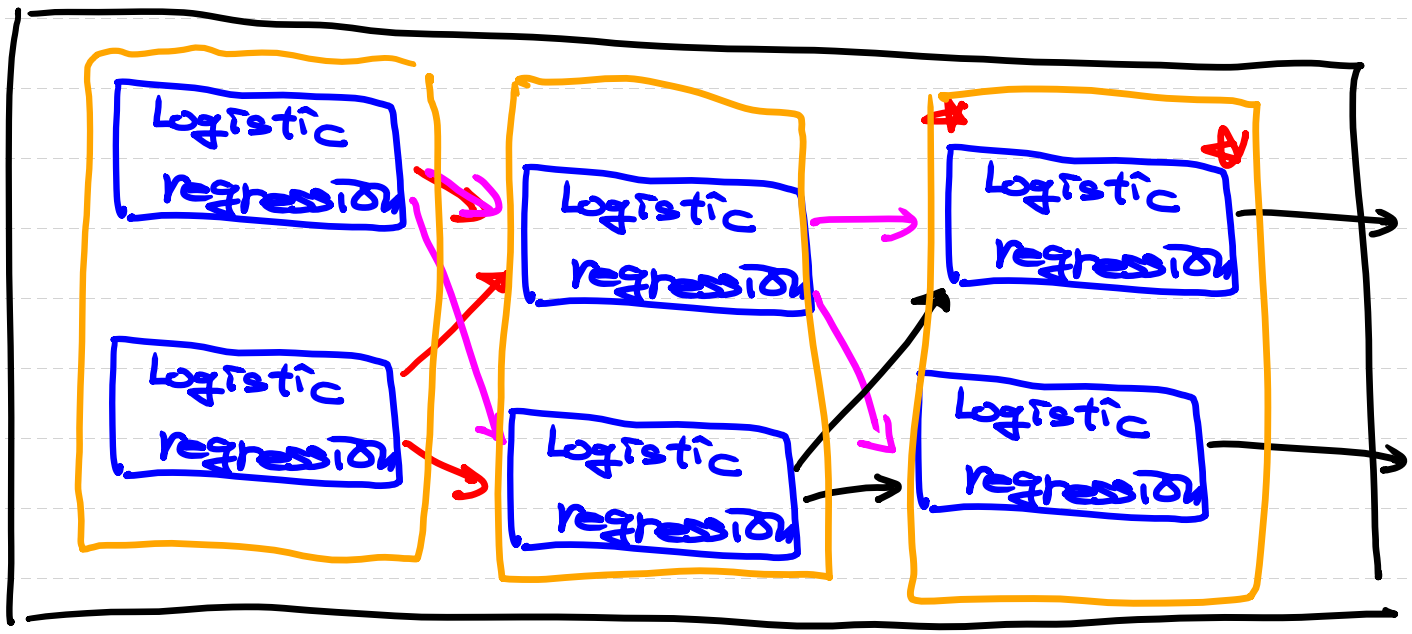
이 문제는 "MLP"가 아니면 학습이 안됨!! → 증명 MLP로 되나요??

N·N (Neural Network – 신경망)



ANN (Artificial Neural Network)

"Deep Learning"



layer

- Deep Learning ✱ 1개의 logistic regression을 표현하는 ✱ node가 서로 연결되어 있는 신경망 구조를 바탕으로

"몇개??"

은닉 Layer가 많을수록 학습이 잘 된다

↳ 어느정도는 맞아요!! (1개~3개)

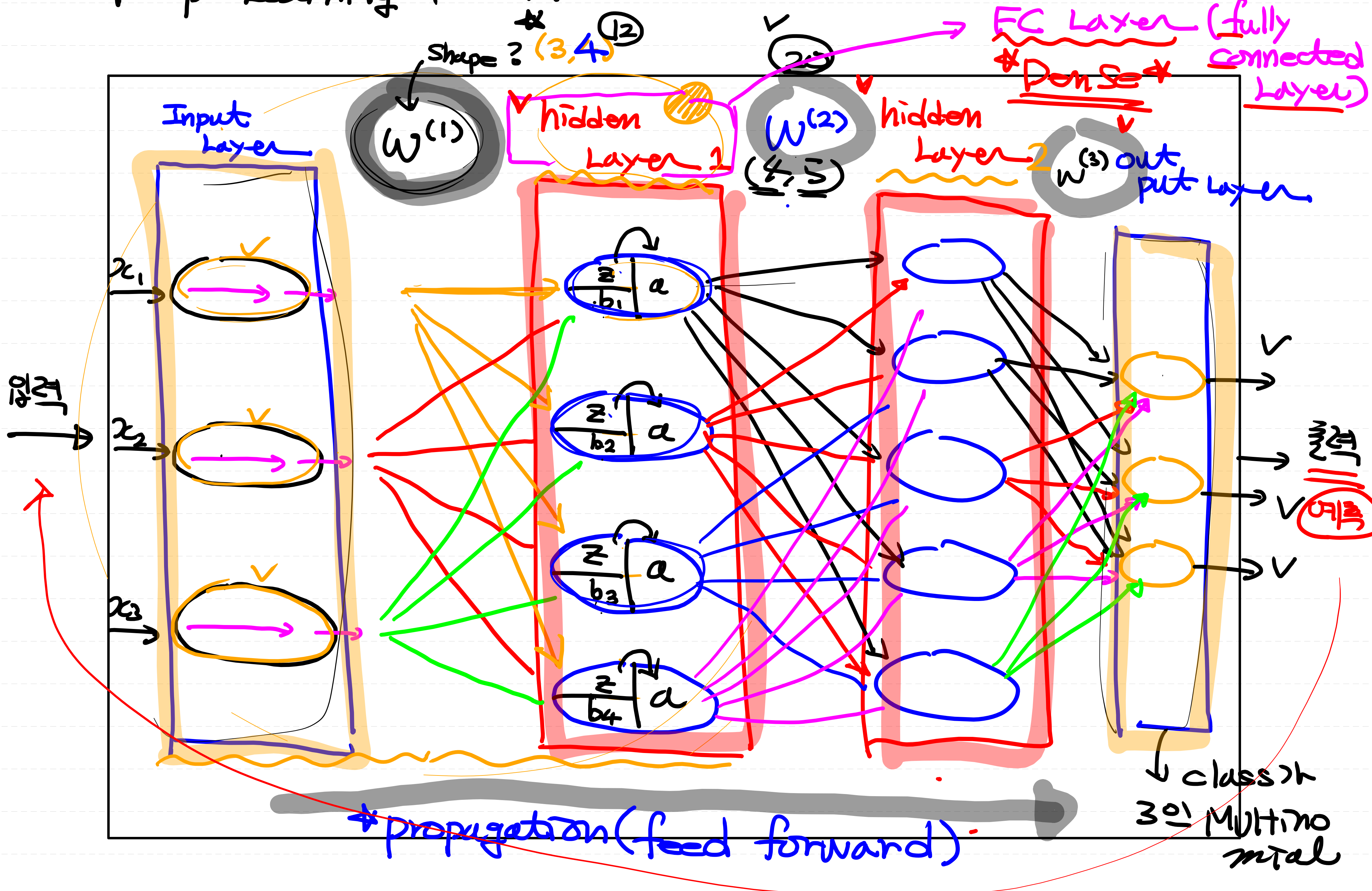
✱ 1개의 입력층 (input layer)
1개 이상의 은닉층 (hidden layer)
✱ 출력층 (output layer)

→

그림은 다음장에 ~~

② Deep Learning Architecture

⬭ : node (logistic regression)



Deep Neural Network (DNN)

↳ 으로 구성된 XOR 구현 ⟷ logistic regression 1개로는 측정이 안되요

⟹ DNN 구조로 확장해서 측정해 보아요 !!