

Ch14 가중치업뎃

2019년 5월 23일 목요일 오후 2:44

* 출입문은 깊은 깊은, its 깊은 깊은, 깊은 깊은

$$o_k = \frac{e^{-\sum_{j=1}^3 (w_{jk} \cdot x_j)}}{1 + e^{-\sum_{j=1}^3 (w_{jk} \cdot x_j)}}$$

\$z_i\$ မှာ ကျင်းမွေးပဲ။

$\sim_j R_k$?

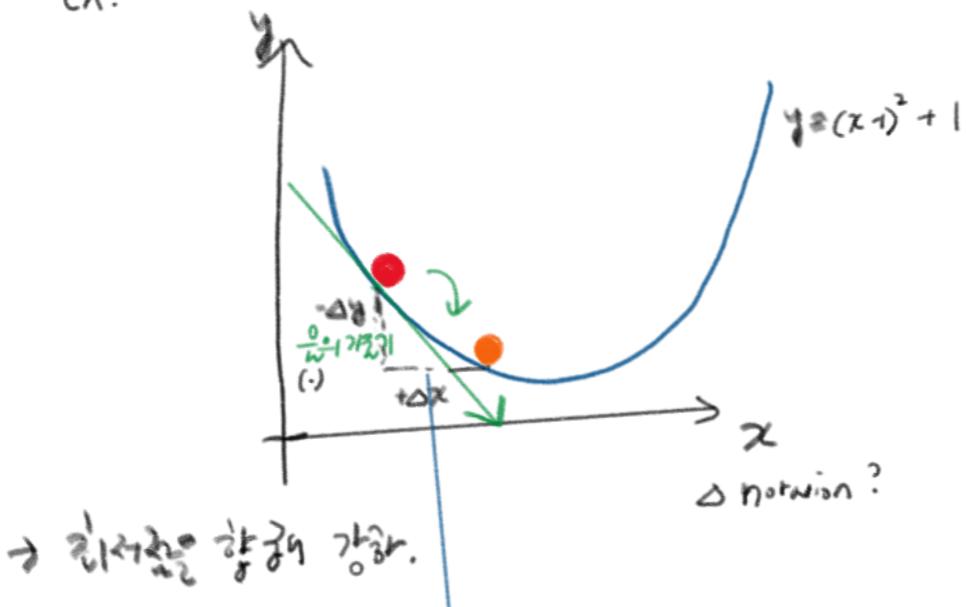
$\sim_i R_j$

cf. $x = W \cdot I \cdot \dots ?$

장서록

c.f. 1012n10g 친환경 소재!!
친환경 소재는 어떤 원리를 사용하는가?

Ex:

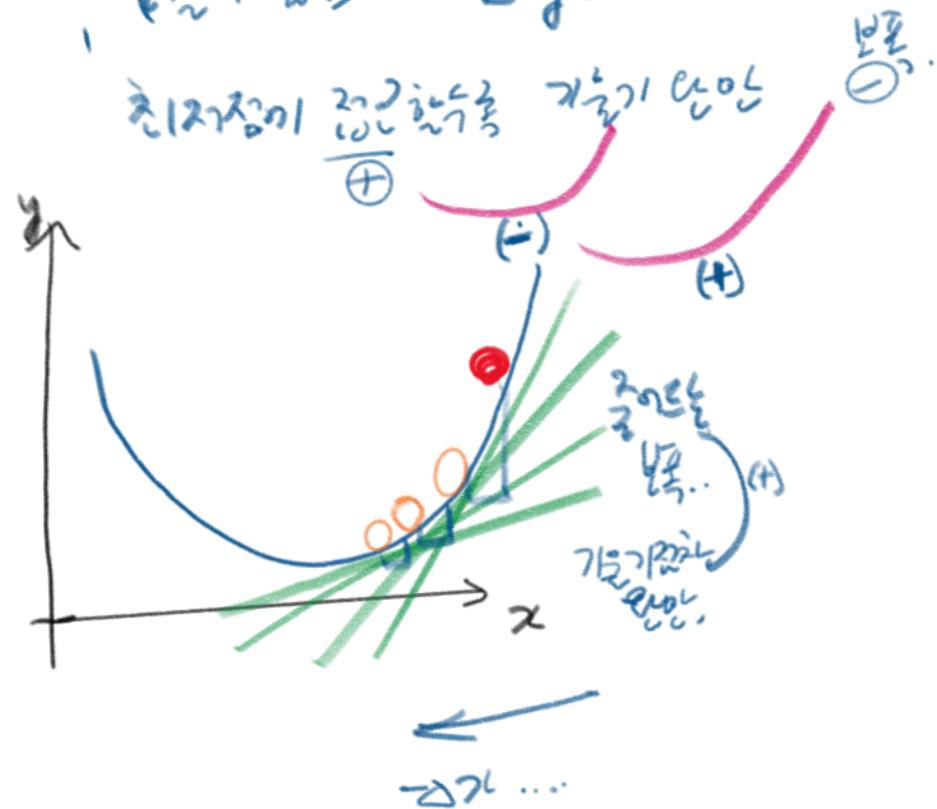


→ 치수값을 향해 강하.

값으로, 예),
 $+ \Delta x$ or $- \Delta x$

값을 고려 중인.
(∴ 연속성: 치수값 고려하기)

* 치수값에 y 값이 0?
(값이 어떤?) $\Delta y = 0$? cf.?



* Q. 치수값의 정의
 $|f'_x| = f'(x+r)$

0 현재 차곡률.
(율률 - 실증)

② 치수값의
가능한 수준?

율률 = $g(f'_x)$ ('율률이트'?).

$$\text{변수} = g(\text{기울기})$$

(+) ----- (-)

결과
계산방법

문제는 보통은

증감하여

$$\begin{cases} +\Delta x \\ -\Delta x \end{cases}$$

로 알고리듬이

이드는 것.

cf. 경제학.
학부수용률.

(구간)이트 : 1

from above:

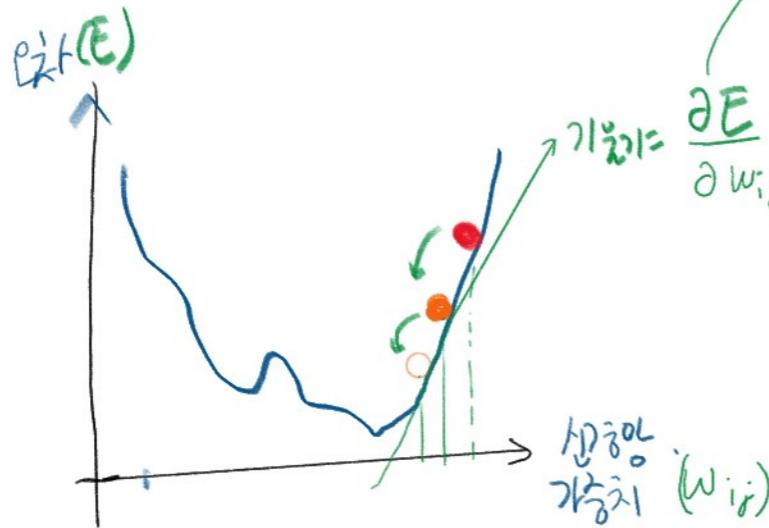
$$\text{변수} = g(F(\text{기울기}))$$

verify?
? (SD)

기울기.

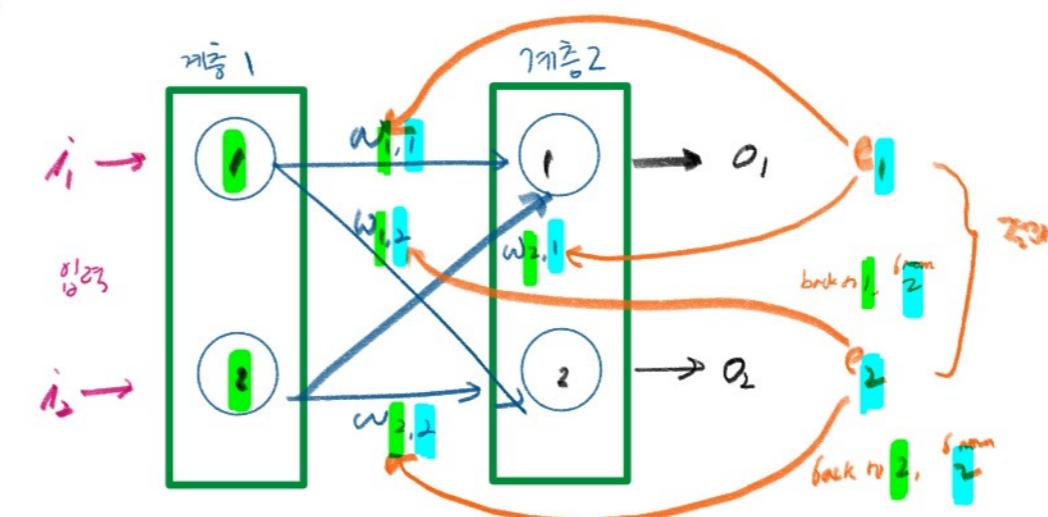
$$C_{ik} = f(\text{기울기})$$

•× 미분을 허용할 수 구하기



parallel
diff.

holding other variables constant: C.C.P.)



기울기 = $\frac{\partial e_i}{\partial w_{ij}}$ 기울기로
술기기 ...

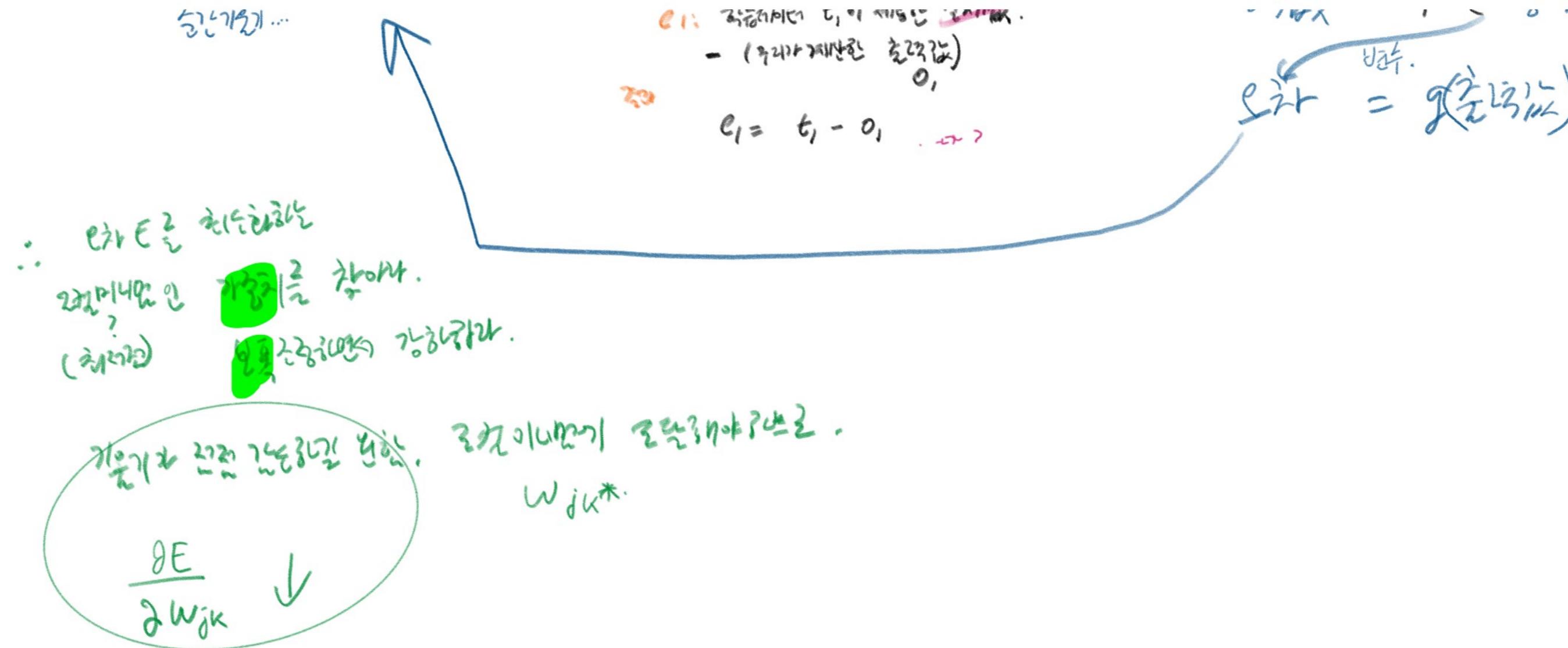


e1: 학습시킬 때 t_1 이 제곱한 실제값.
- (우리가 계산한 출력값)

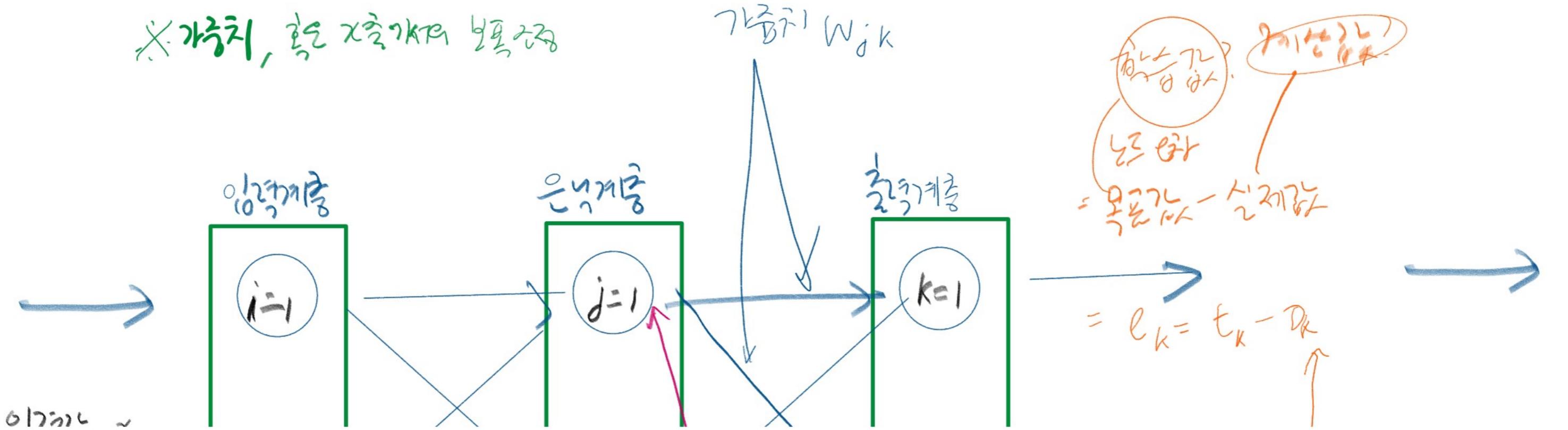
$$\frac{1}{2} \sum_{i=1}^n e_i^2 = f(\text{기울기})$$

비례.

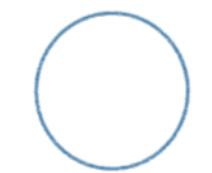
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* 가중치, 혹은 x 축 가중치 부여 문제

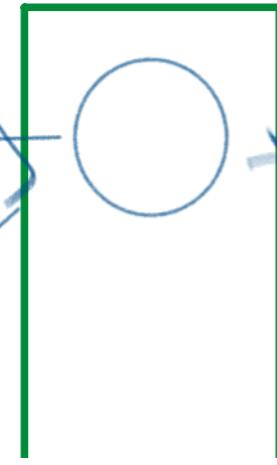


임력기종

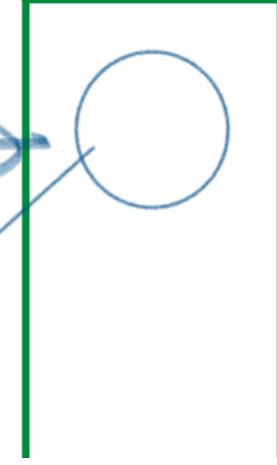


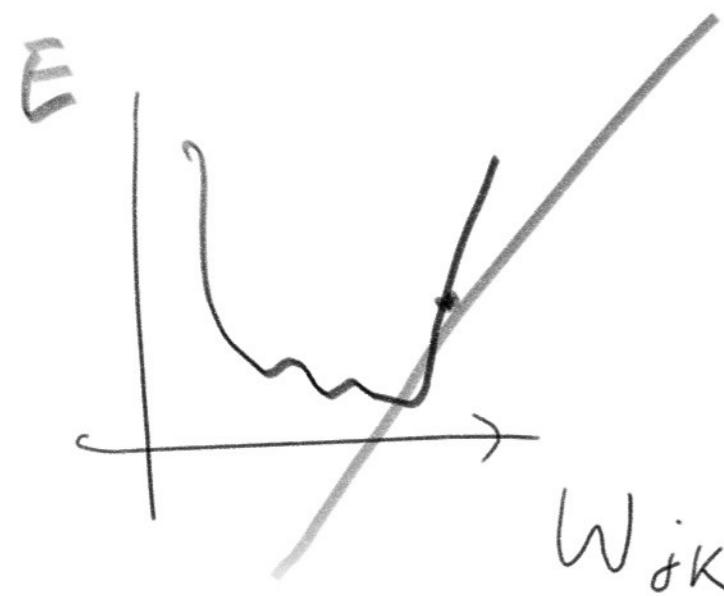
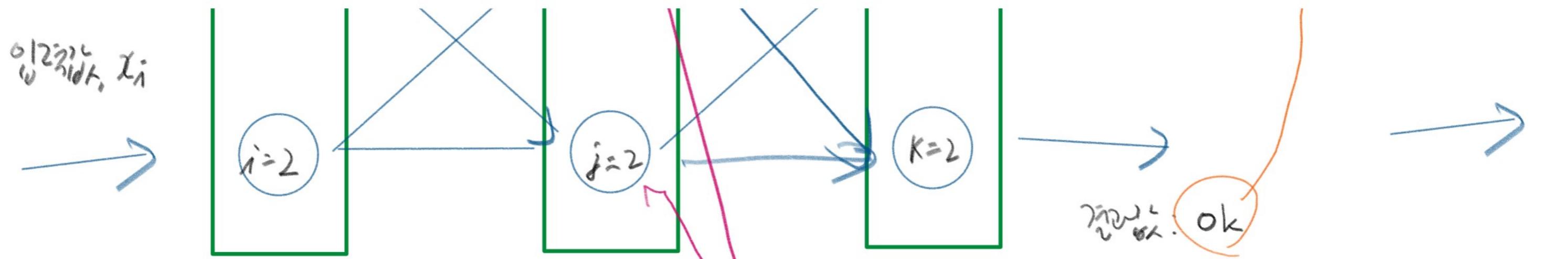
—

은핵기종



중성기종





입력 \$x_j\$

$$= O(x_k)$$

Sigmoid

→ 에너지 E 와 관계:

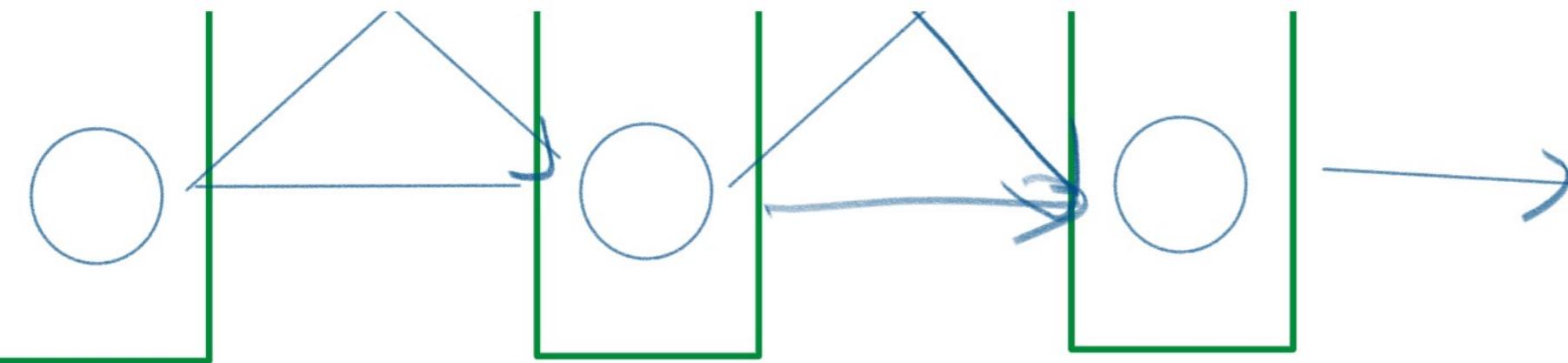
" \hat{x}_n "

$$E = \sum_n (t_n - o_n)^2$$

(Ex: $n=1$
 $n=2$
 $n=3$)

Q(

$$\frac{\partial E}{\partial w_{jk}} = \frac{\partial}{\partial w_{jk}} \sum_n (t_n - o_n)^2$$

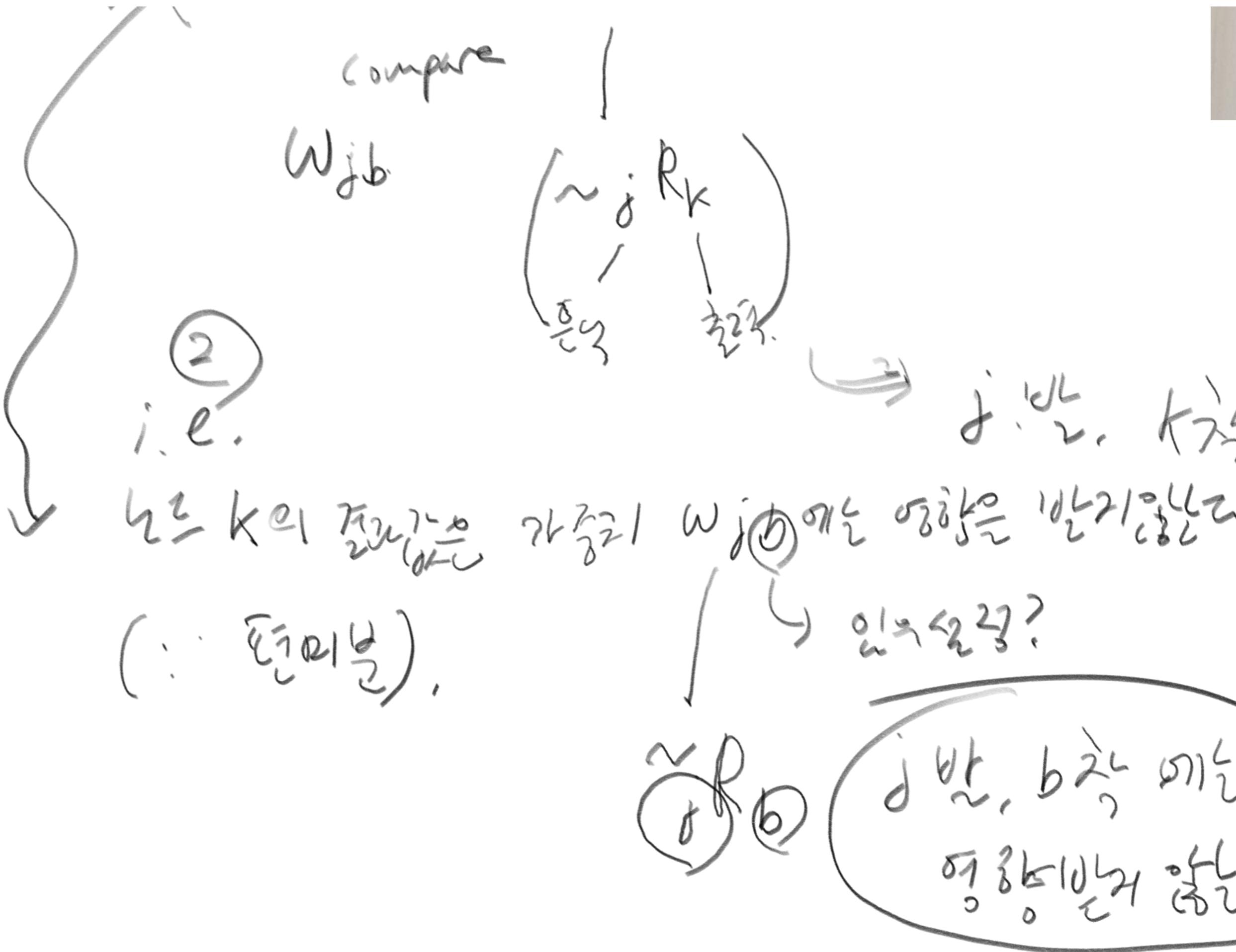


습 목표 값과 실제 값 간의 차이를 의미하므로 우리는 결과 암수를 쉽게 오차함수로 변환할 수 있습니다.

여기에서 주의해야 할 점이 있습니다. 다음 표에는 3개의 출력 노드에 대한 목표 값, 실제 값과 함께, 오차함수로 쓸 후보가 세 가지 있습니다.

실제 결과 값	목표 값	오차 (목표 값 - 실제 값)	오차 목표 값 - 실제 값	오차 $(목표 값 - 실제 값)^2$
0.401	0.5 t_1	0.1	0.1	0.01
0.802	0.7 t_2	-0.1	0.1	0.01
1.003	1.0 t_3	0	0	0
합		0	0.2	0.02

첫 번째 후보의 경우에서 오차함수는 단순히 **(목표 값 - 실제 값)**입니다. 언뜻 보



③ 2

첫 번째 우도의 경우에 그 시점에서 고려하는 (교포 - 관세)입니다. 그 다음에 충분히 합리적인 오차함수로 보이지만 전체 노드의 오차를 구하기 위해 합을

$$\sum_{i=1}^D (t_n - o_n)^2$$

$$n = 3.$$

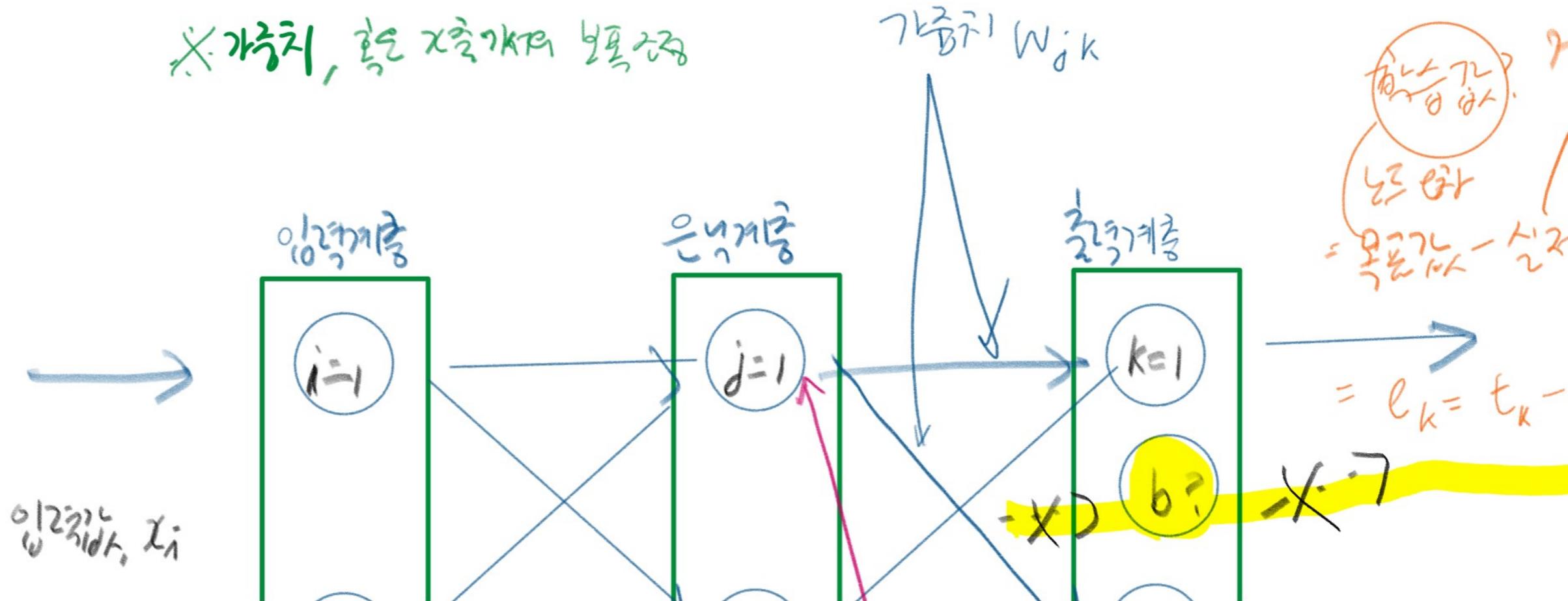
라

③ 즉, 이 \tilde{z}_0 은 부정. (그림: $\sum_n C_n$)

W_{ijk} 이 연결노드인 예. ex.

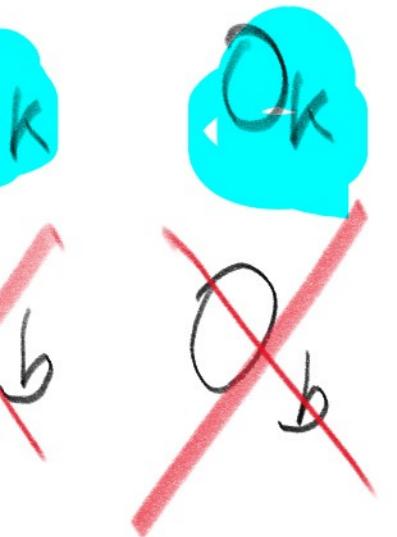
~~t~~

* 가중치, 혹은 출력가중치 보통



$$\left(\hat{e}_n - e_n \right)^2$$

*)

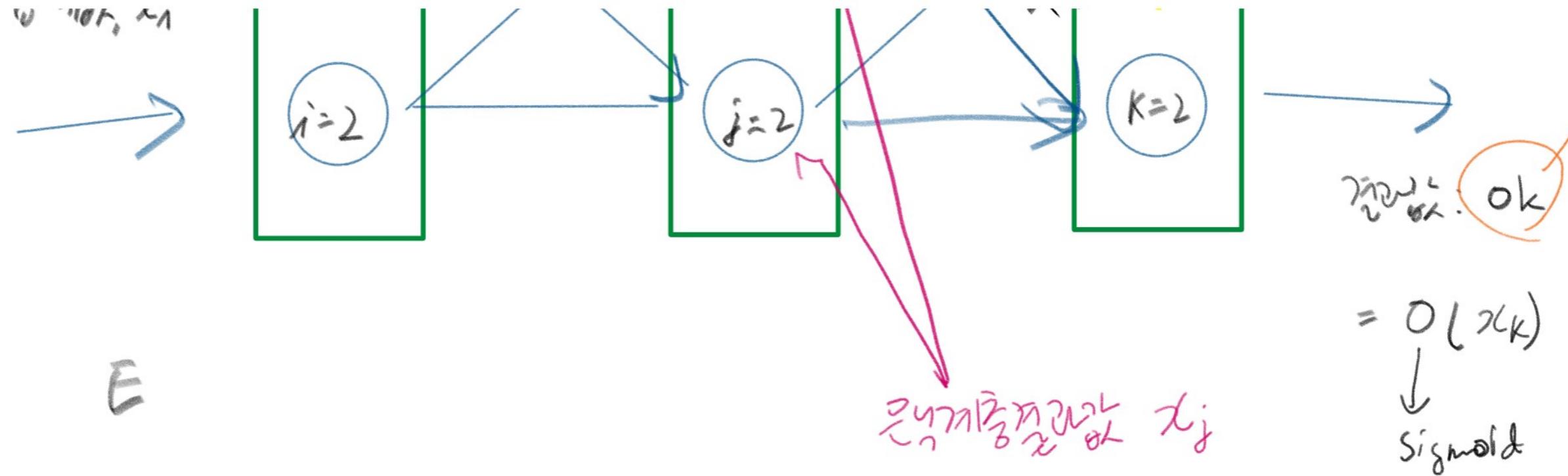


\rightarrow 연습문제에서 출제한 것은
그리고 그 가중치만
여기서 예상한 양과 같을 때

연습문제는 예상이

정답을 알았지.

~~out~~, ~~out~~ out.



$\begin{pmatrix} 4 \\ * \end{pmatrix}$

수시 간주자(?)

From
above:

$$\frac{\partial E}{\partial w_{jk}} =$$

$$\frac{\partial}{\partial w_{dk}} (t_k - o_k)^2$$

decompose:

$$\frac{\partial E}{\partial w_{jk}} =$$

=

$$\frac{\partial}{\partial}$$

$$\frac{E}{\partial_k} \cdot \frac{\partial \theta_k}{\partial W_{jik}}$$

$$\frac{(t_k - \theta_k)^2}{\partial \theta_k} \cdot \frac{\partial \theta_k}{\partial W_{jik}}$$

$$\frac{\partial E}{\partial \theta_k} \cdot \frac{\partial \theta_k}{\partial W_{jik}}$$

①

Wjk 구는 대로

가장치

(+)

②

~기 때는 Ok 같다

정답?

(+) ?

(1)

④

~기 때는 E 같다

정답

$(t_k - 0)$

? (

 $-2(t$

where:

 $(t_k - 0_k)$

= ~~L²~~

k^2 է օկուլայտ նշանակու,

$$(\bar{v}_k - v_k) = \frac{\partial v_k}{\partial w_{jk}}$$

J^2

$$\rightarrow 1 + v_k^2 \quad \text{ուստի } v_k^2$$

$$e^i = t_k^2 -$$
$$\vdots$$
$$\vdots$$
$$\vdots$$

$2tk \cdot ok + ok^2$ ok of missed "is".

$-2tk \cdot + ok$

$-2(tk - ok)$

where $a = 2$

Group

(126)

ut.

z rər 7977L 111 - 7

$$-2(t_k - o_k) \cdot \frac{\partial o_k}{\partial w_{jk}}$$

$$\equiv -2(t_k - o_k) \cdot \frac{\partial}{\partial w_{jk}} \text{sig}$$

where O_k :

$$\left[\begin{array}{c} O_1 \\ O_2 \\ \vdots \\ O_n \end{array} \right]$$

void $\left(\sum_j w_{jk} \cdot O_j \right)$
j^{wt}
root

where O_k :

Is key global
Not sig?

↳ 01 123P-R in 238

$\sigma(x)$

X_k)

Sigmoid($\sum_i w_{jk} \sigma_j$)

$\frac{\partial U(k)}{\partial x_j} \sim \sigma'(x_j)$

≠ sig

of 25:

$\frac{1}{2} \pi$

mid

272/28.

where :

∂
—

∂ 

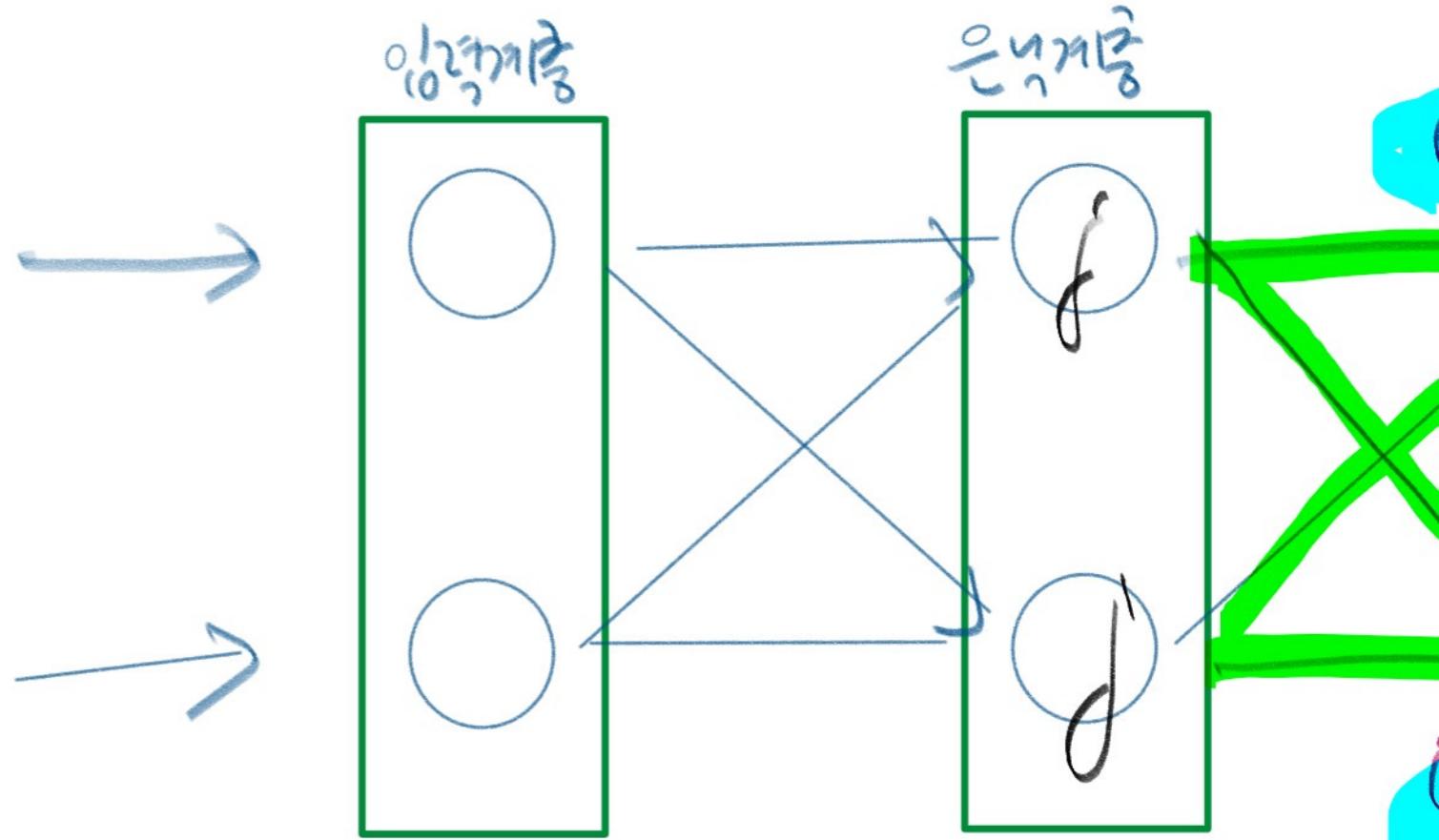
Sigmoid(χ)

 compare

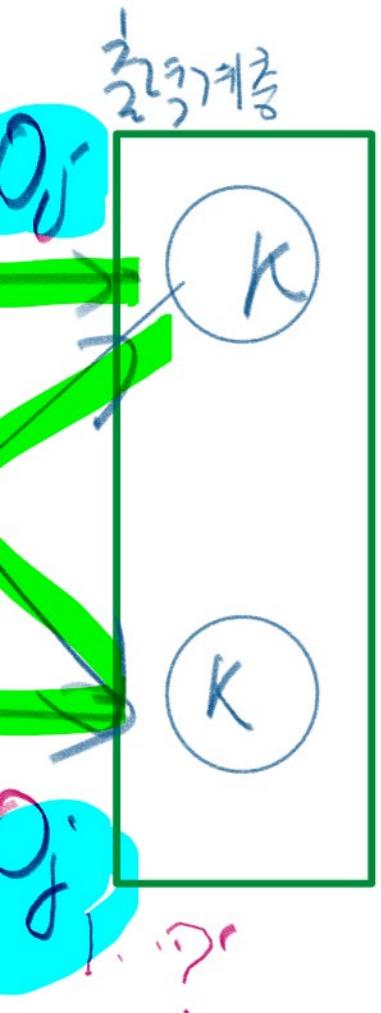
-

($[x \rightarrow 1]$ ) / 1

"Output
"j'k'lk'j"



(d, n, f, l, r, ✓))



$$(h \cdot R_k)$$

온ly 출입 가능

온ly에서 출입 가능
로는 가능하지.

온ly 중의
로는 출입 가능

Oj

人

= Sigmoid (~~x~~) (i)

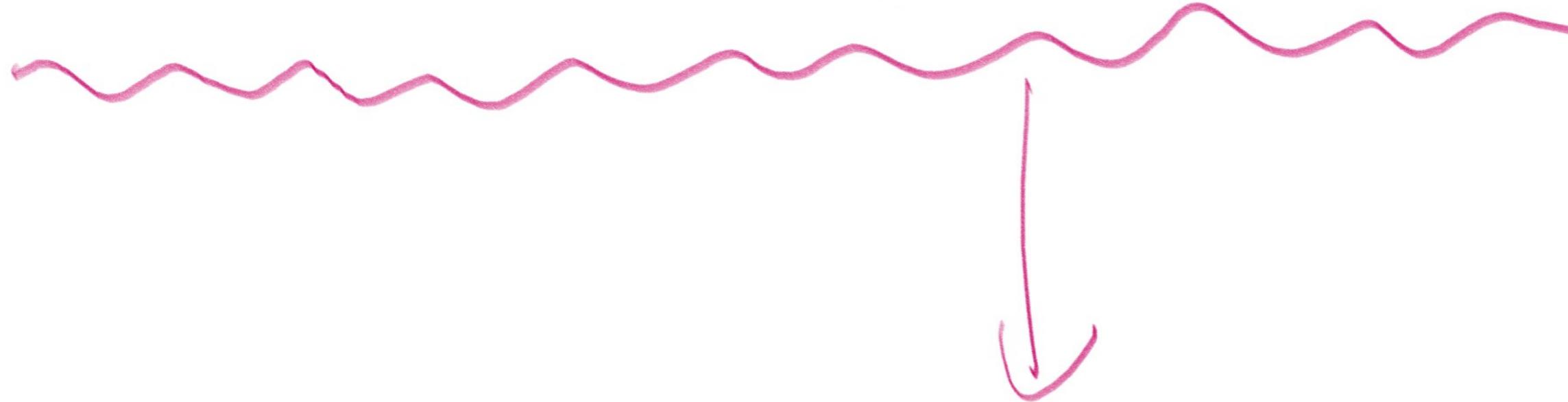
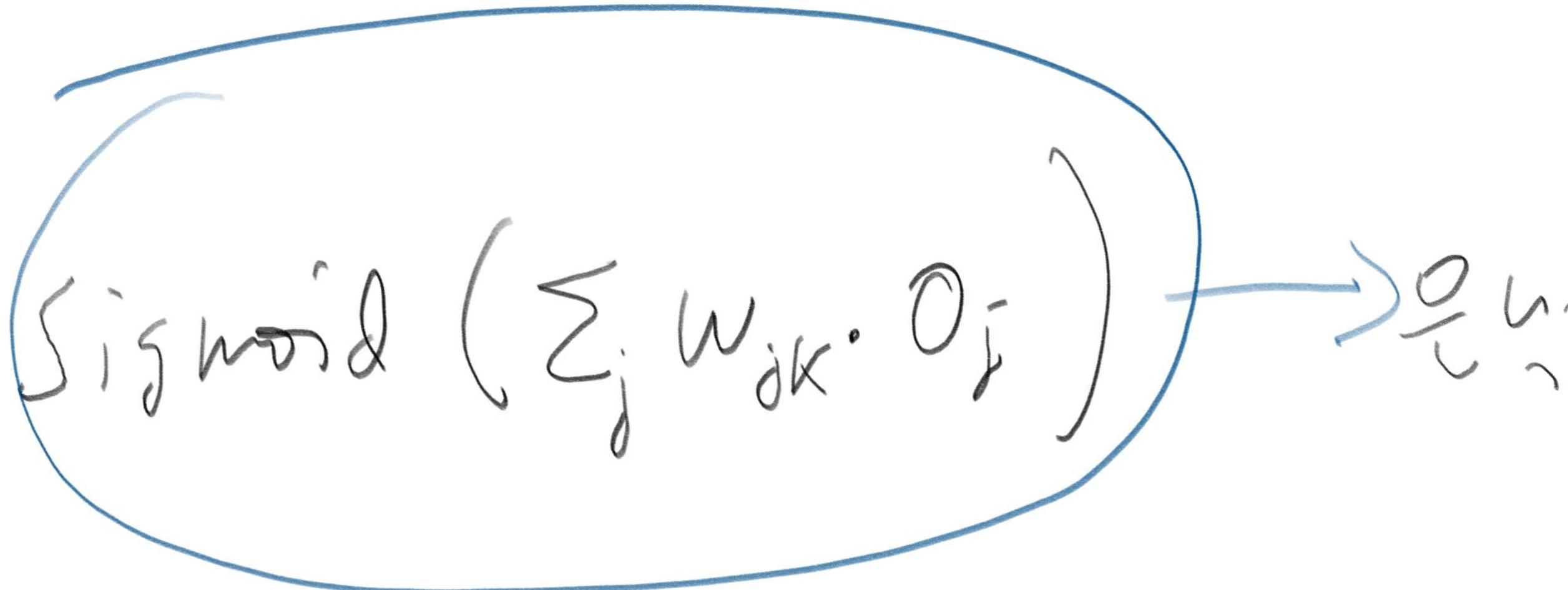
→ Sigmoid (x) → cf. $\frac{1}{1+e^{-x}}$.

$$\frac{\partial E}{\partial W_{jk}} = -2(E_k - O_k).$$

Likewise,

$$\frac{\partial E}{\partial \theta} = -2(E_k - O_k).$$

$$\frac{\partial}{\partial w_{jk}}$$



A diagram showing the derivative of the sigmoid function. A blue arrow points from the top diagram down to a black equation: $\text{Sigmoid}(\sum w_{ik} \cdot o_i) (1 - \text{Sigmoid}(\sum w_{ik} \cdot o_i))$. A circled '2' is next to the word "Sigmoid" in the equation.

$$\text{Sigmoid}(\sum w_{ik} \cdot o_i) (1 - \text{Sigmoid}(\sum w_{ik} \cdot o_i))$$

이후 편리한 계산을 위하여.

(0t)

현제의 차

시도의 차

$$\text{id} \left(\sum_i w_{ik} \cdot o_i \right).$$



$$\frac{\partial}{\partial}$$

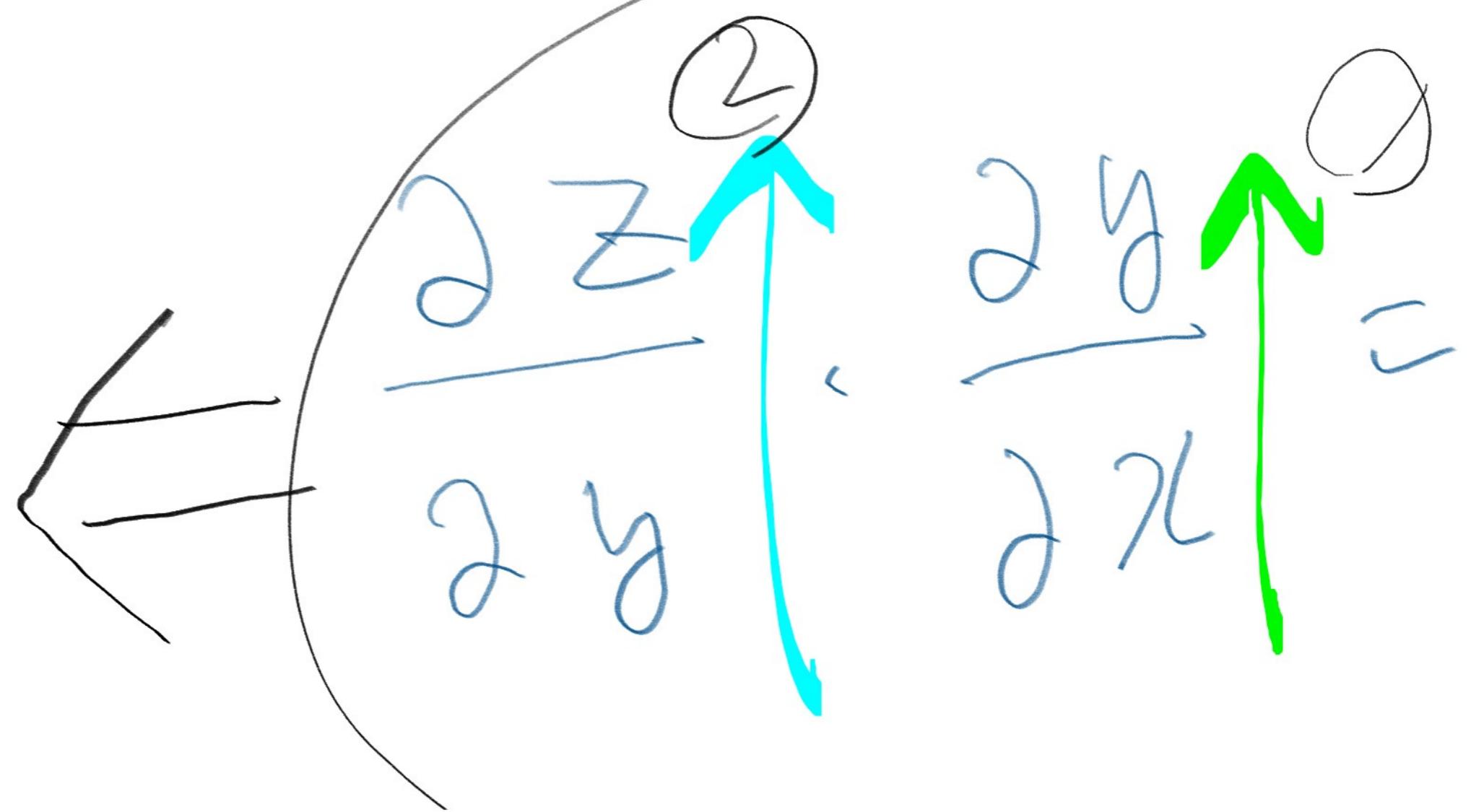
$$\sum_i w_{ii}$$

는지:

나누?

$\kappa \cdot O_i$)

(Gumbel)

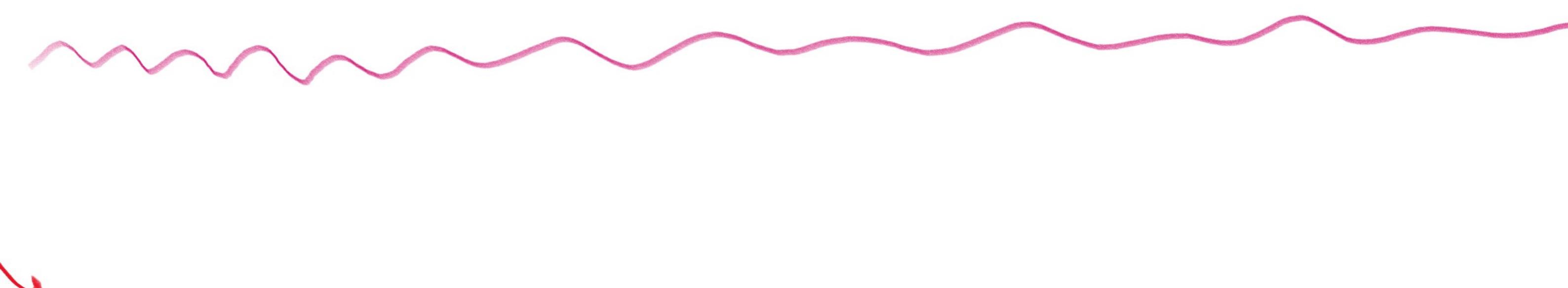


$$\frac{\partial z}{\partial x}$$

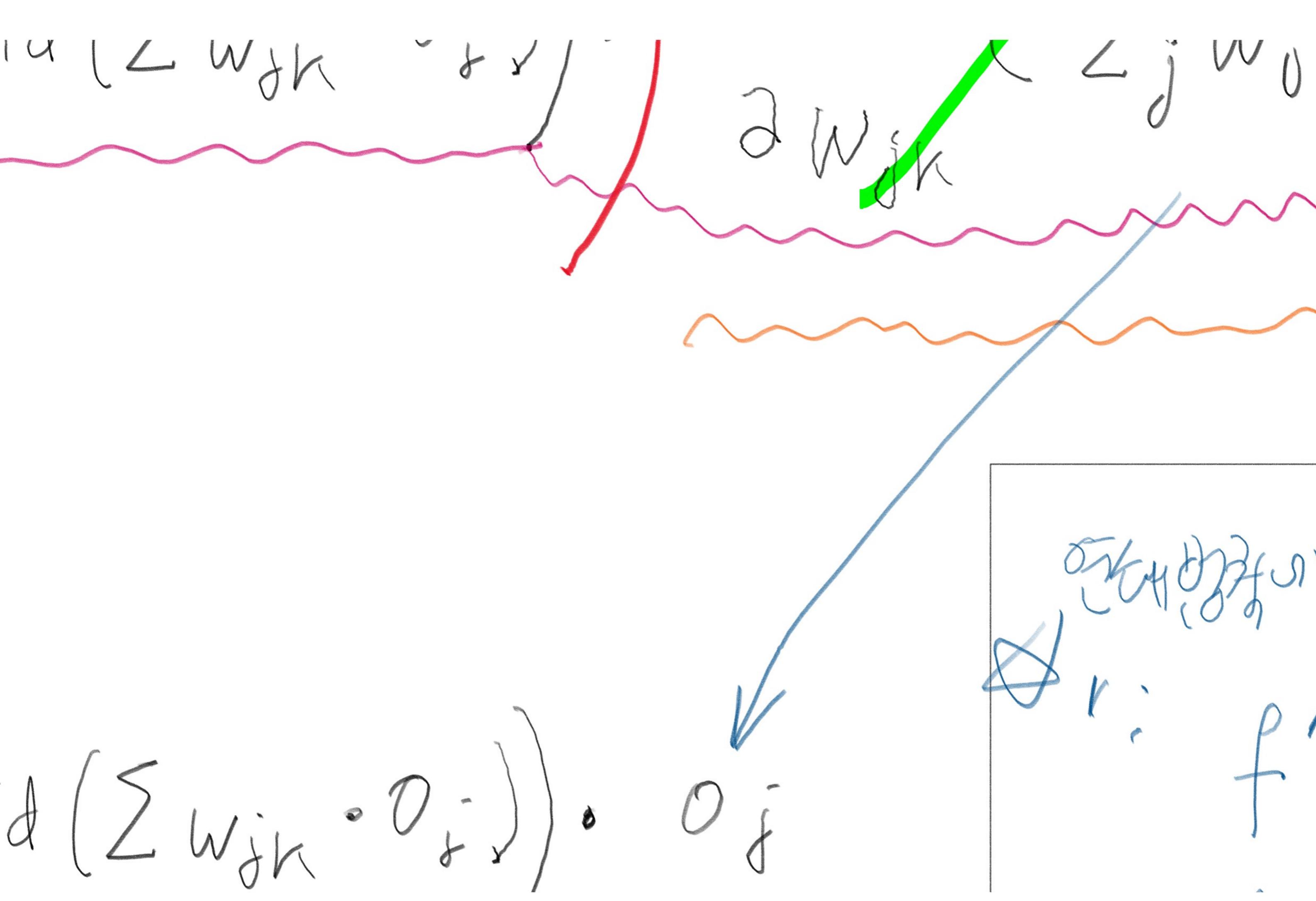
$$\overline{\partial} \tilde{w}_{jk} = -(\psi_k - \psi_{k'})$$

$$(-2)(\psi_k - \psi_{k'}).$$

Sigmoid($\sum w_{jk} \cdot o_j$) (1 - Sigmoid)



Sigmoid($\sum w_{jk} \cdot o_j$) (1 - Sigmoid)



w_{jk})

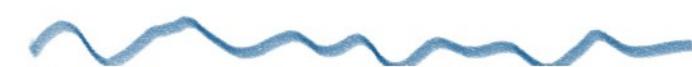


HD90%
输出

$\sum w_{jk} \cdot o_j$

而 $f(g(x)) = \frac{2}{2} \cdot h(y)$,

$(g(x)) \cdot g'(x)$

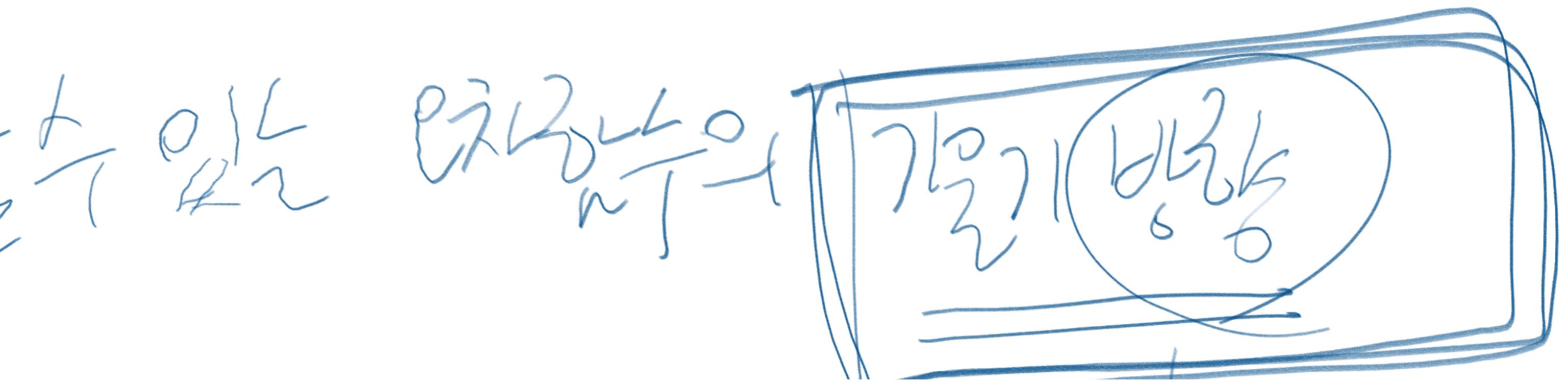




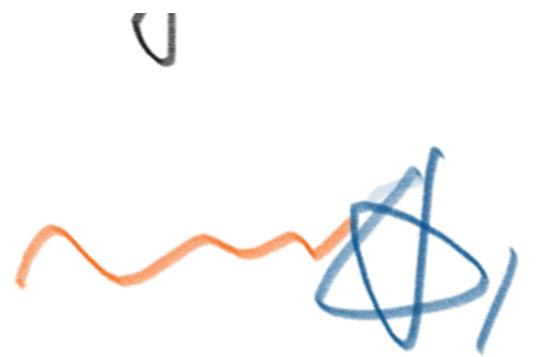
$$\frac{\partial E}{\partial w_{jk}} = \text{ReLU}(e_k - o_k).$$

96 72782

$\text{Sigmoid}(\sum w_{jk} \cdot o_j) (1 - \text{Sigmoid}(\sum w_{jk} \cdot o_j))$



$$\text{mid} \left(\sum_{j=1}^6 w_{jk} \cdot o_j \right) \cdot o_j$$



Projekt, w_j out.

w_j

շղի անձնություն,

շղի անձնություն.

համակարգ f'

համակարգ g'



պահանջ.

$$\sum \underline{c(17)}$$

cf.

"
հետև
օրոքը են
այսպէս ուն

~~է~~

car E 01

✓ 131

~~OK~~ out. //

δ

(+)

$\vdash \exists_{OK} (?)$?

(=)

?

(δ)

or

b12c

한국수

7. 2022년 05월

1

~~76~~

212

✓

勾选.





$$\frac{\partial \bar{E}}{\partial w_{jk}}$$

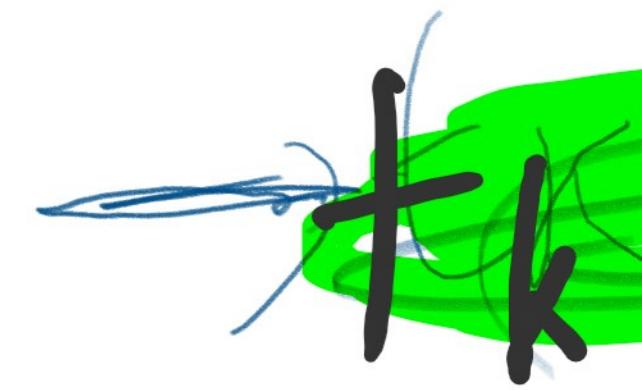
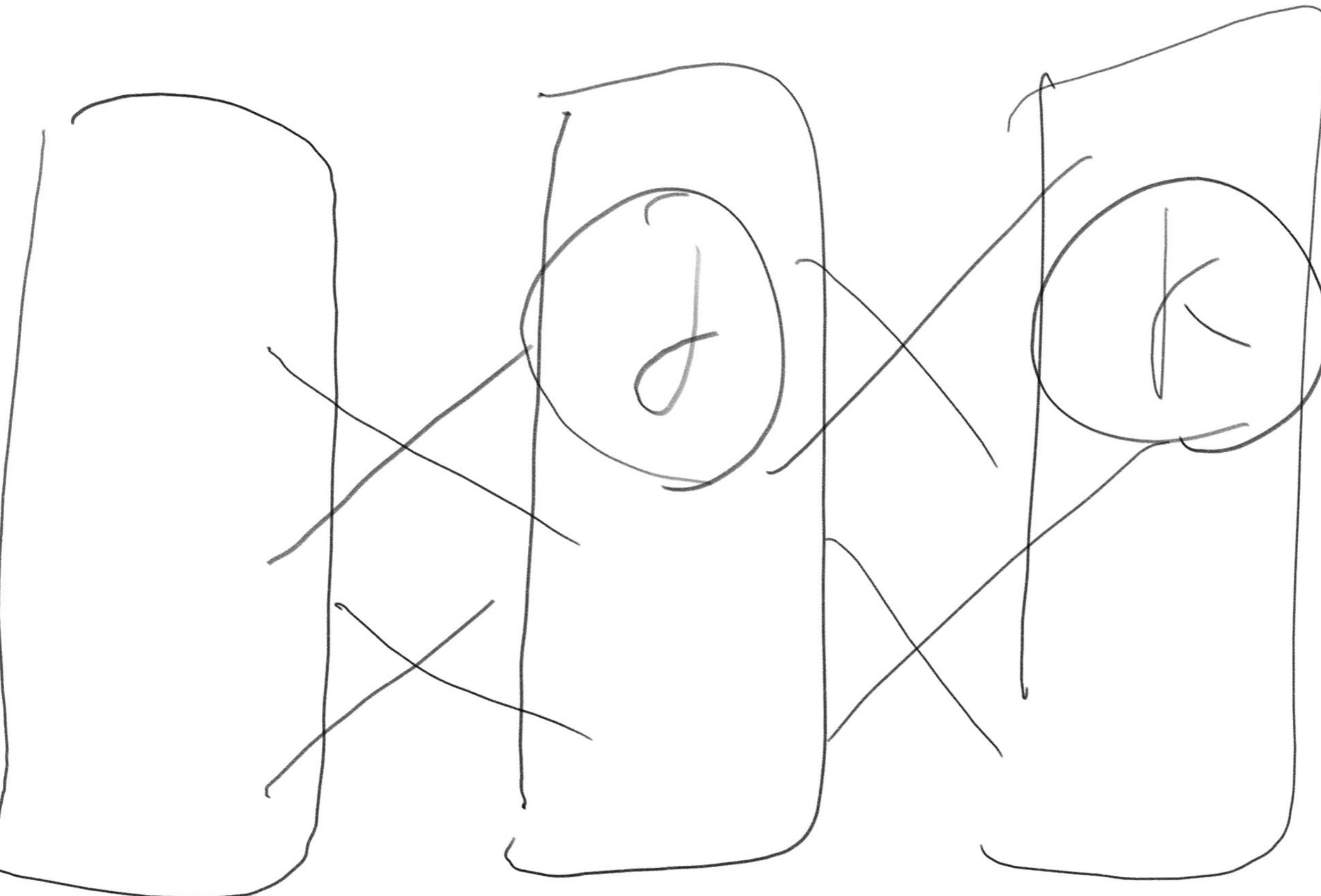
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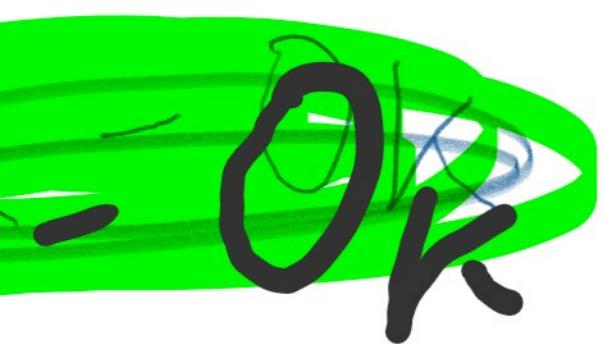
$$-(\epsilon_k - o_k)$$

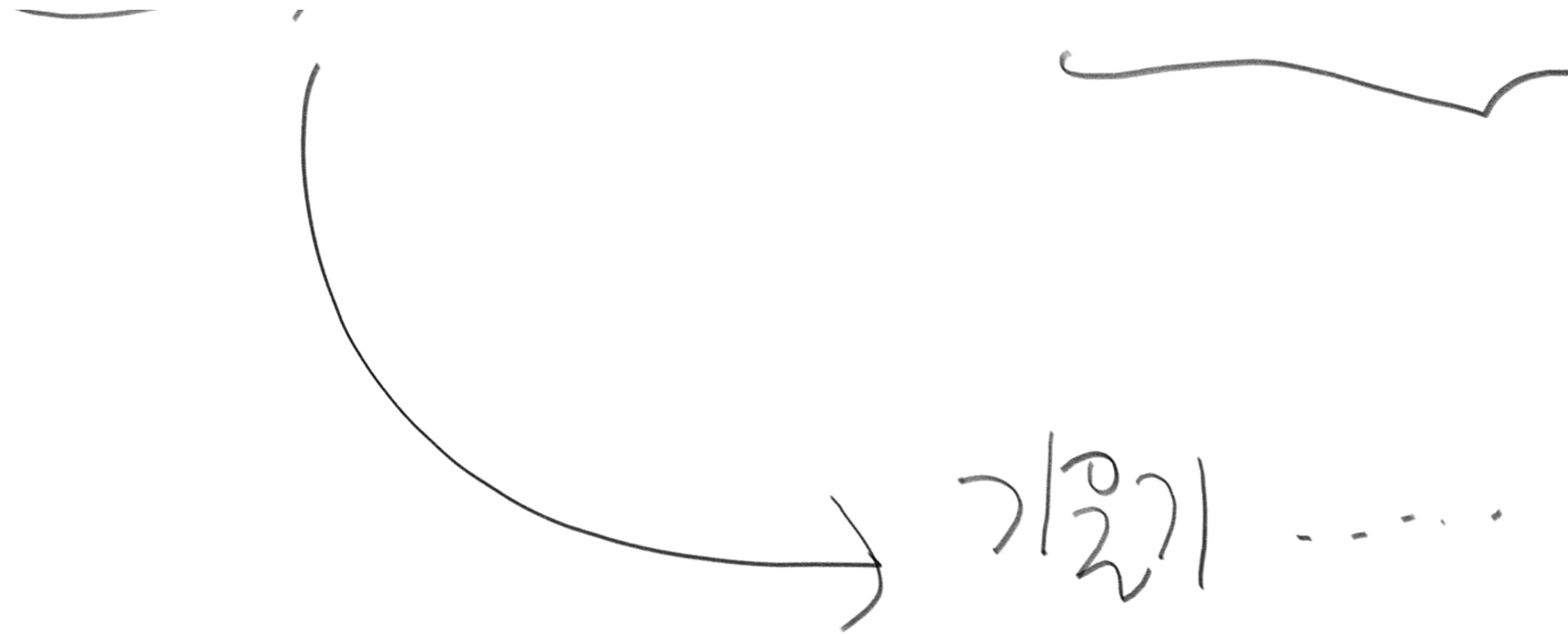
51%
20% ... sig2?

• Sigmoid $(\sum_j w_{jk} \cdot o_j) (1 - \text{Sigm}$

$$\text{sigmoid}\left(\sum_j w_{jk} \cdot o_j\right) \cdot o_j$$







↑

이 예전에 쓴 글입니다 (22383 번지)

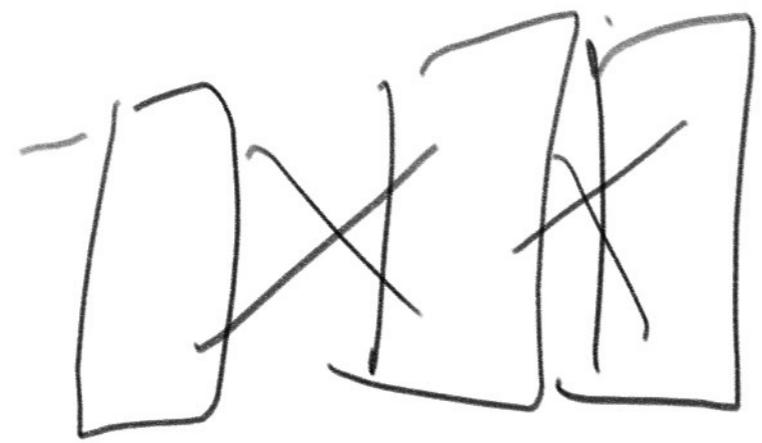
결국

w_j

자연계의
생물학적
다양성

... 는
생물 다양성이
무엇인가?

SD)



212
w L.

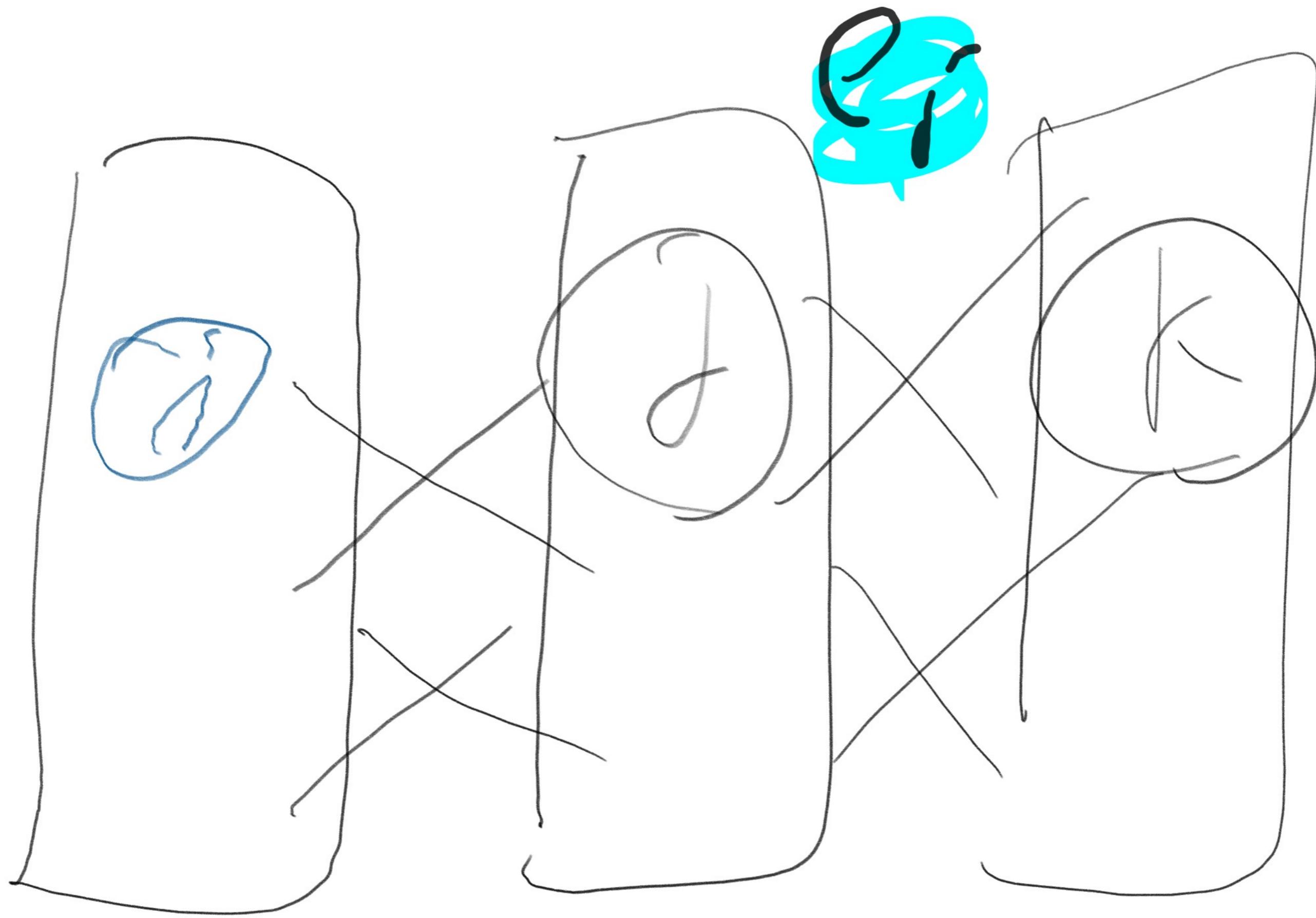
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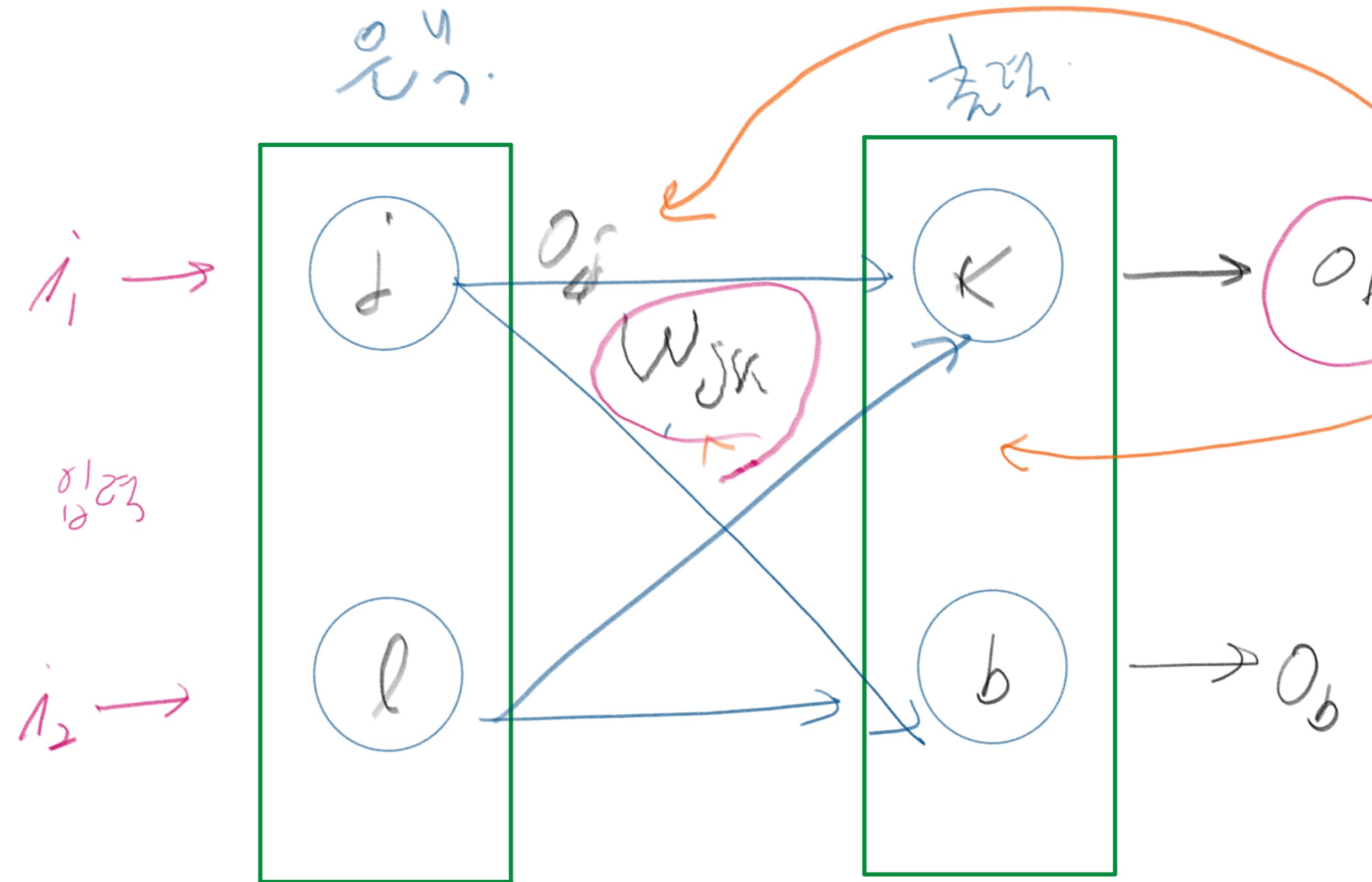
- (e_j)

$$\cdot \text{Sigmoid} \left(\sum_k w_{jk} \cdot o_j \right) \left(1 - \text{Sigm} \right)$$

o u

$$\text{mod} \left(\sum_1^6 w_{jk} \cdot O_i \right) \cdot O_i$$





k) . $E_k - \alpha_k$.

- ($t_k - 0$)

$$k) \cdot \text{Sigmoid} \left(\sum_j w_{jk} \cdot o_j \right) \left(1 - \text{Sigmoid} \left(\sum_j w_{jk} \cdot o_j \right) \right)$$

$$\rightarrow (t_k - o_k) \cdot \frac{\partial}{\partial w_{jk}} \text{Sigmoid} \left(\sum_j w_{jk} \cdot o_j \right)$$

$$\text{sigmoid}\left(\sum_j w_{jk} \cdot o_j\right) \cdot o_j$$

$$w_{jk} \cdot o_j)$$

ch.15

12

July 2, 5

$$\frac{\partial E}{\partial w_{jk}} \overset{(1)}{=} \frac{\partial E}{\partial o_k} \overset{(2)}{=} \cdot \frac{\partial o_k}{\partial w_{jk}} \overset{(3)}{=}$$

Dec - 12

61271

.... 오늘은 어떤 날이야?

?

입학제한

온난기종

한국기종

가장자리

X'

Q. $j = 1$ 일 때
은 어떤 경우인가?

임의자정

1



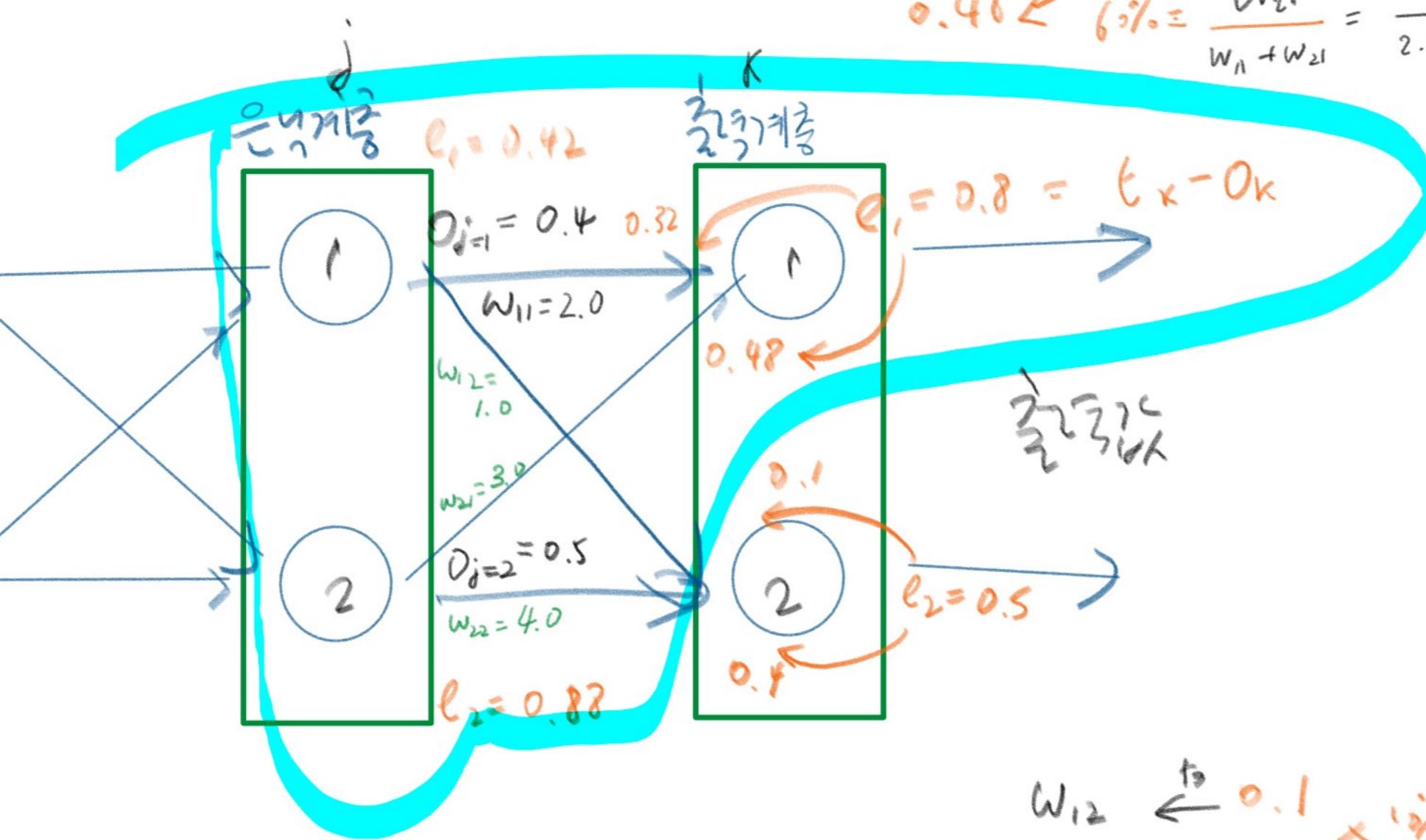
경우 1

2



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1) w_{11}
2) (1) 허락한가?



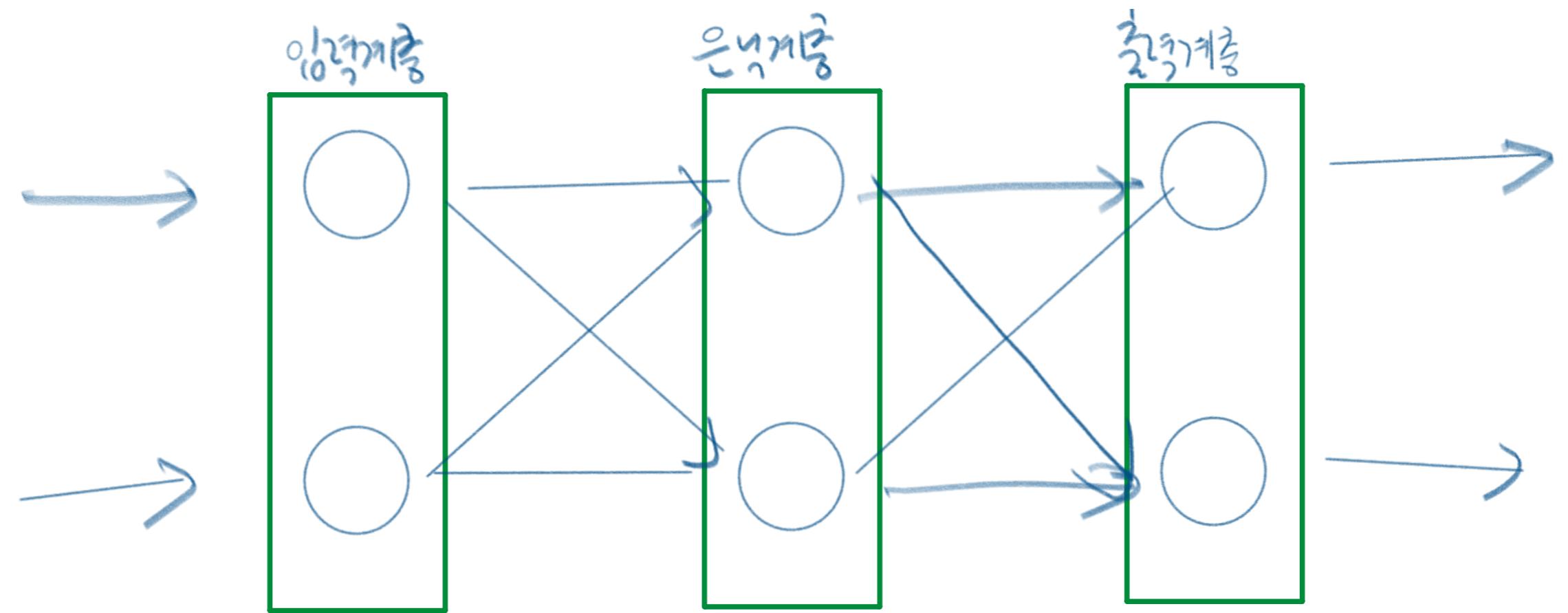
$$w_{11} \xleftarrow{t_1} 0.32 \quad \begin{aligned} & 40\% = \frac{w_{11}}{w_{11} + w_{21}} = \frac{2.0}{2.0 + 3.0} \\ & 0.8 \end{aligned}$$

$$w_{21} \xleftarrow{t_2} 0.48 \quad \begin{aligned} & 60\% = \frac{w_{21}}{w_{11} + w_{21}} = \frac{3.0}{2.0 + 3.0} \end{aligned}$$

△
e₂는 1
0.32는 0.8

...
일반화 가능한가?
안쓰임? 0.271 쓰고
0.32,

$$w_{12} \xleftarrow{t_1} 0.1 \quad \begin{aligned} & 10\% = \frac{w_{12}}{w_{12} + w_{22}} = \frac{1.0}{1.0 + 4.0} \\ & 0.5 \end{aligned}$$



1w?
0.48 ...

—



$$\frac{\partial E}{\partial W_{jk}} = - (t_k - \dots)$$

where:

$$\sum_j W_{jk}$$

$$w_{22} \xleftarrow{0.4} \xrightarrow[80\%]{>0.5} = \frac{w_{22}}{w_{12}+w_{22}} = \frac{4.0}{1.0+4.0}$$

$$-o_k) \cdot \text{Sigmoid}\left(\sum_j w_{jk} \cdot o_j\right) \left(1 - \text{Sigmoid}\left(\sum_j w_{ik} \cdot o_j\right)\right) \cdot o_j$$

$$o_i = w_{11} \cdot o_{j=1} = 2.0 \cdot 0.4 = 0.8$$

$$+ w_{21} \cdot o_{j=2} = 3.0 \cdot 0.5 = 1.5$$

2.3.

$$\Rightarrow y = \frac{1}{1+e^{-2.3}} = 0.909.$$

cf.

Q.

$j=1$ մ 7 ի վեց w_{ij}

ո՞ւ օրդինատները կայուն չեն?

Ի՞նչ? $\Delta w_{jk} = \alpha \cdot$

Ո՞ւ յէ՞ս? new $w_{jk} -$

where $j=1, k=1$

$\alpha = 0.1$

where

$$\rightarrow J - \frac{1}{1 + e^{-2.3}} = 0.909.$$

$$0.8 \cdot 0.909 (1 - 0.909) \cdot 0.4 \doteq -0.0265$$

$$E_k \cdot o_k(1-o_k) \cdot o_j^T ? \quad (130) \xrightarrow{\text{for computer?}}$$

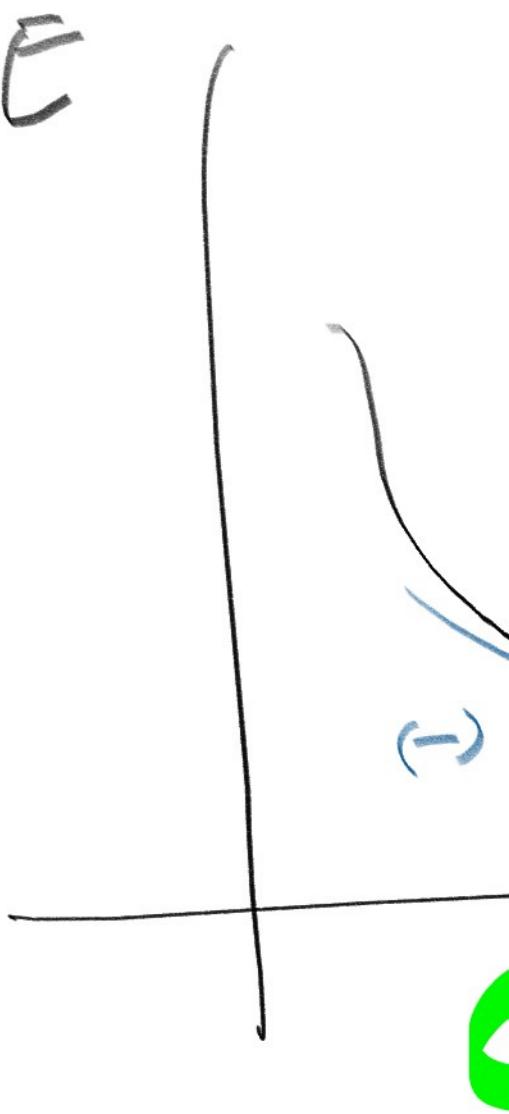
$$- \text{old } w_{jk} = - \boxed{\alpha \cdot \frac{\partial E}{\partial w_{jk}}} \quad (129) \rightarrow \text{수학적 표현} \dots$$

(-1) 부정방법

양수(기울기)일 경우. (+)

새로운 가중치는 줄이도록 (-) 봉인갓?

where



new

(-) 부정방

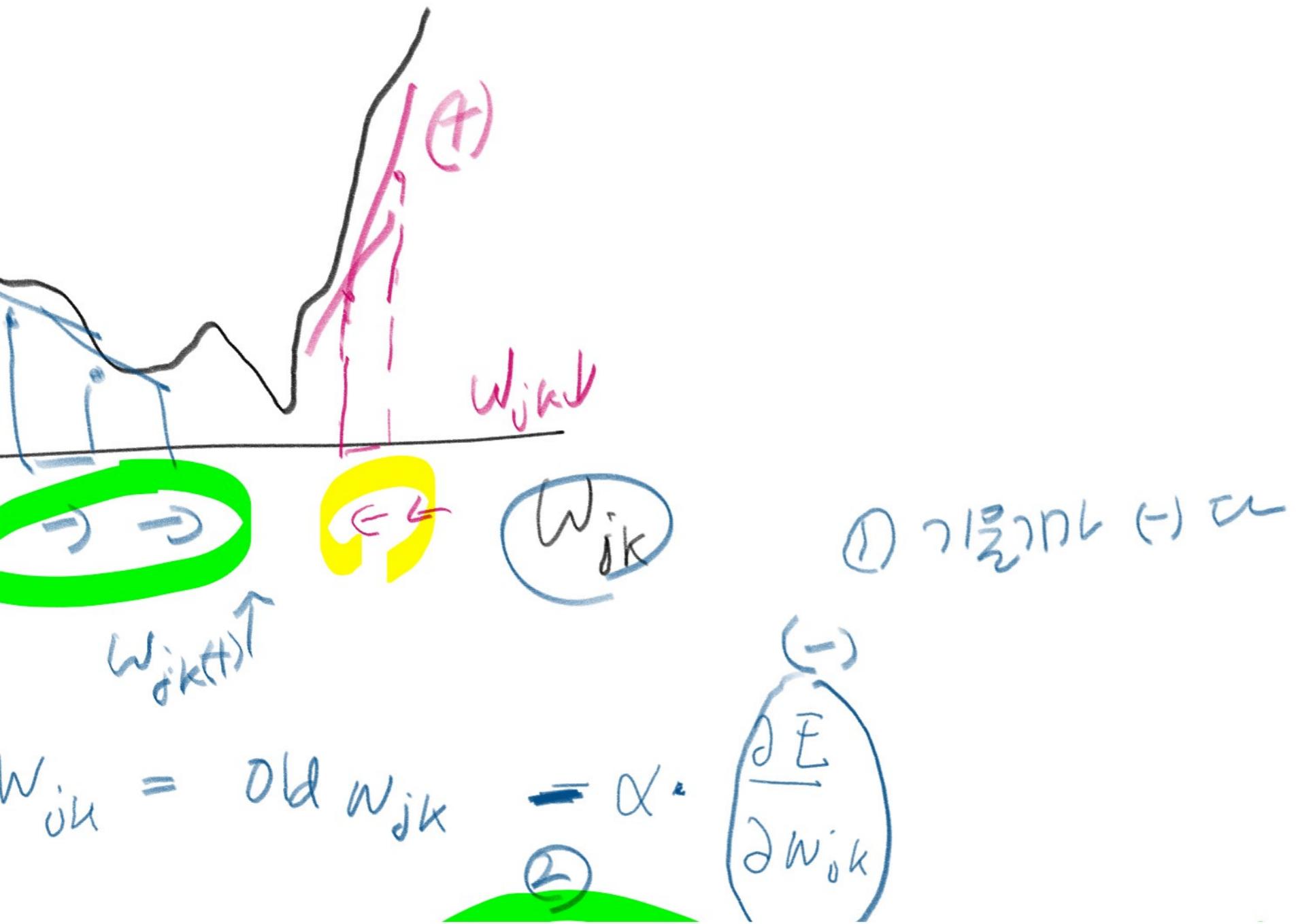
[시그모이드 가중치는 0~1이] \rightarrow 예상!

∴

(+)肯定방

음의 가중치가 있. (-)

시그모이드 가중치는 0~1이?



$$w_{jk} = \text{old } w_{jk} - \alpha \cdot$$

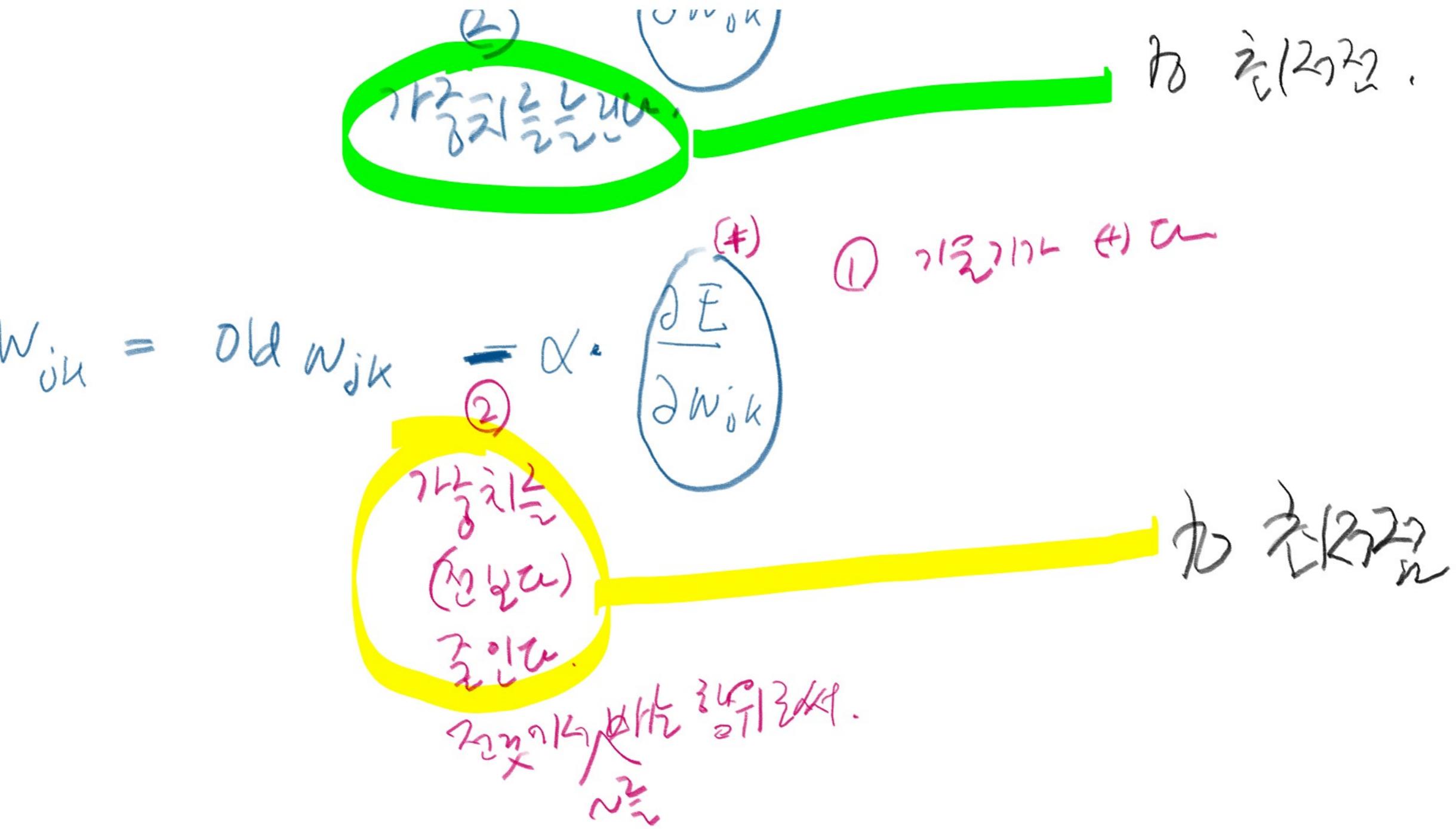
$$\frac{\partial E}{\partial w_{ik}}$$

$n \approx 12n_2$

(129)

new

From above,
new W,



$$w_{ii} = 2.0 = \text{old } w_{ijk}$$

$$w_{ii} = \left(0.1 \cdot (-0.0265) \right)$$

$$2.0 - 0.00265 = 1.99735$$



def)

자수
 $\frac{7}{10}$?

각각의

91

28

$$= 2 + 0.00265 = 2.00265$$

▶

회귀수의 가중치 편미분값에 따라, 시그모이드 가중치를 중/가중... 치

수정?

"기울기를 이용해 가중치를 업데이트" (135)

시그모이드

&
기울기 예시.

$$y = \frac{1}{1 + e^{-2.3}} = 0.909.$$

① x가 클수록...

$$\equiv -0.0265$$

$\equiv 1.8 \cdot 0.909 (1 - 0.909) \cdot 0.4$

12722 2722

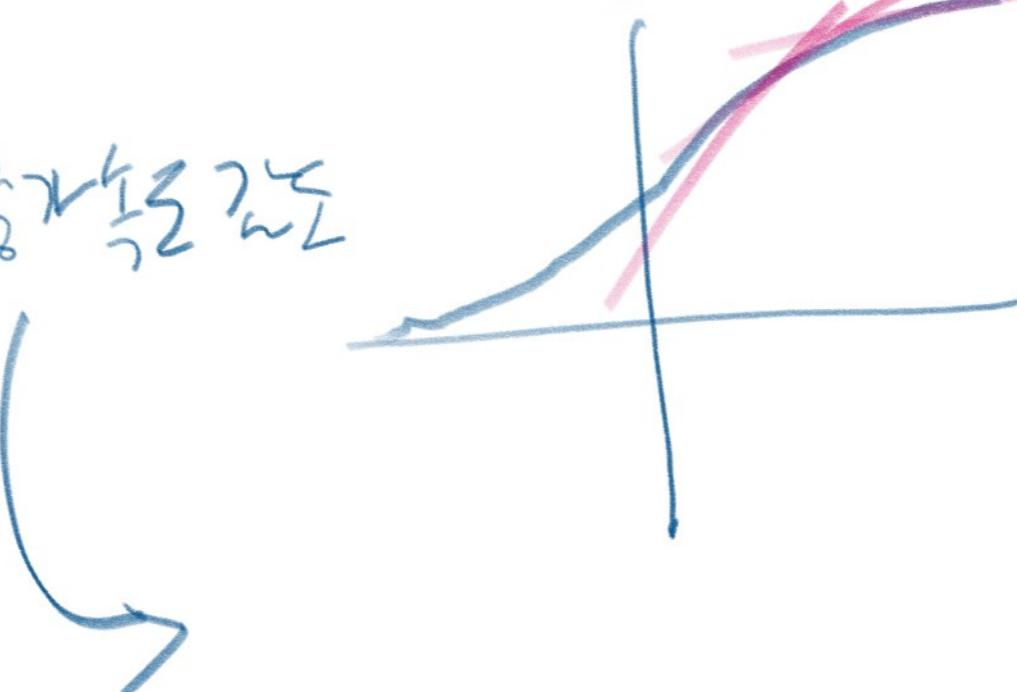
$$g = \left(\frac{1}{1 + \left(\frac{1}{e^{x_1}} \right)} \right)^T$$

$\frac{d}{dx}$

$\frac{1}{n}$

2

· 예술가의 감정



내가 저걸 놓고. 엄마이든... 속상한 느낌인가?
(미안해?)

A yellow oval containing the handwritten Chinese character '天气' (weather) with a blue border. An orange arrow points from the right side of the oval towards the right edge of the page.

온 가족이

Wjk. στ
Αγρι

→ 0j (감각신경) ...

(감각신경을 통하기 ...)



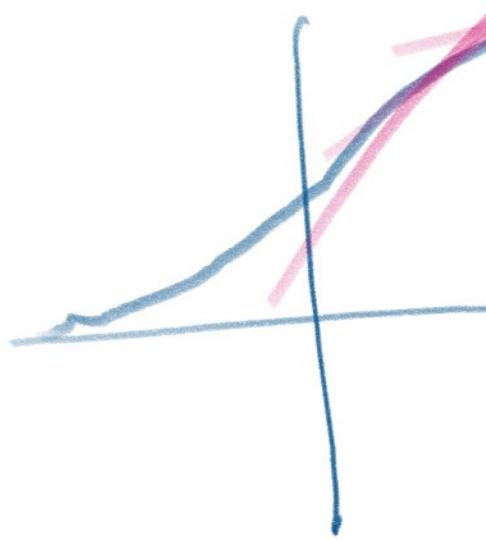
갈증인가? (SD)

갈증인가? (SD)

여전히 갈증

여전히 갈증
여전히 갈증
여전히 갈증
여전히 갈증

(135)

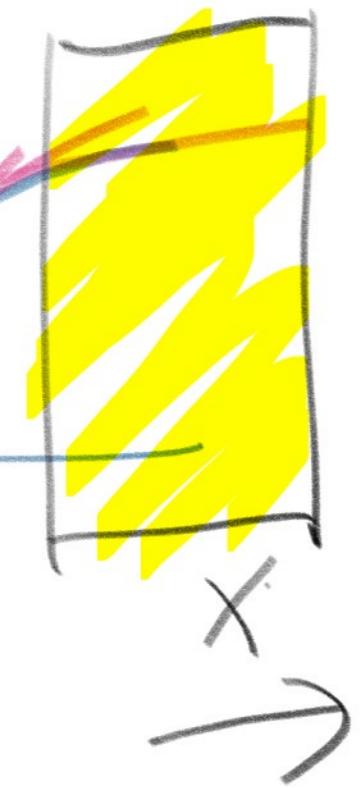


/sig

나이

여성
(여성)

(135)



여자는 것.

그간

