

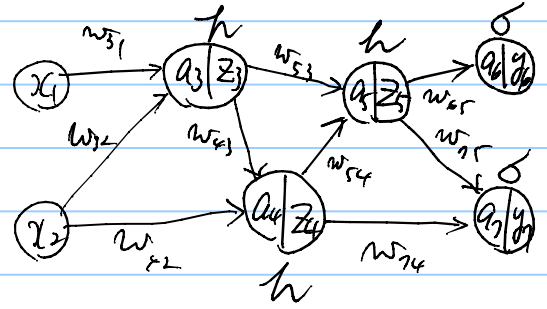
# 演習 5.15

$$J_{hi} = \frac{\partial y_h}{\partial x_i} = \frac{1}{\frac{\partial x_i}{\partial y_h}}$$

① = ②

$$\frac{\partial x_i}{\partial y_h} = \sum_j \frac{\partial x_i}{\partial a_j} \frac{\partial a_j}{\partial y_h}$$

$$= \sum_j \frac{\partial x_i}{\partial a_j} \delta_{hj} \quad \dots \textcircled{1}$$



出力 \$a\_j\$ への \$x\_i\$ の影響

$$\frac{\partial a_j}{\partial y_h} = \begin{cases} \frac{1}{\sigma'(a_j)} & j=h \\ 0 & j \neq h \end{cases} = \frac{\delta_{hj}}{\sigma'(a_j)}$$

\$a\_j\$ への \$a\_e\$ の影響

$$\frac{\partial x_i}{\partial a_j} = \sum_e \frac{\partial x_i}{\partial a_e} \frac{\partial a_e}{\partial a_j}$$

$$\frac{\partial a_e}{\partial a_j} = \frac{1}{\frac{\partial a_j}{\partial a_e}} = \frac{1}{w_{je} h'(a_e)}$$

$$= \sum_e \frac{\partial x_i}{\partial a_e} \frac{1}{w_{je} h'(a_e)} \quad \dots \textcircled{2}$$

$$\begin{cases} a_j = \sum_i w_{ji} z_i = \sum_i w_{ji} h(a_i) \\ \frac{\partial a_j}{\partial a_e} = w_{je} h'(a_e) \end{cases}$$

$$\frac{\partial x_i}{\partial x_j} = \delta_{ij} \quad \dots \textcircled{3}$$

①, ②, ③ を使って \$x\_i\$ の \$y\_h\$ への影響方向を \$J\_{hi}\$ と表わすことができる