Quiz-1

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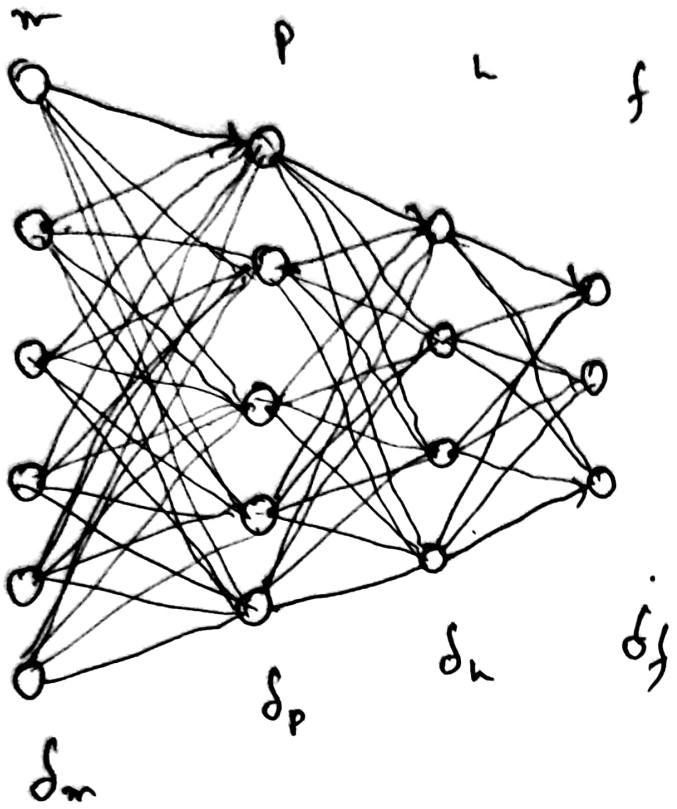
Section- 02



Given,

$y_f = \varphi'(v_f)$

$y_h = \varphi''(v_h)$

$y_p = \varphi'''(v_p)$

$y_m = \varphi'(v_m)$

$v_f = \sum_f w_f y_1$

$e_f = d_f - v_f$

$E = \frac{1}{2} \sum_f e_f^2$

$\delta_{mf} = -\frac{\partial E}{\partial y_{fm}} \frac{\partial y_{fm}}{\partial v_{fm}}$ $\quad \left| \frac{\partial y_{fm}}{\partial v_{fm}} = \varphi'(v_{fm}) \right.$

$-\frac{\partial E}{\partial y_{fm}} = -\sum e_p \frac{\partial e_p}{\partial y_{fm}}$

$= \sum e_p \left[-\frac{\partial e_p}{\partial v_p} \right] \frac{\partial v_p}{\partial y_{fm}}$

here, $-\frac{\partial e_p}{\partial v_p} = \varphi'''(v_p)$ $\quad \frac{\partial v_p}{\partial y_{fm}} = w_{pm}$

$\therefore -\frac{\partial E}{\partial y_{fm}} = \sum \delta_p w_{pm}$

now, $\delta_m = \varphi'(v_m) \sum \delta_p w_{pm}$ —— (1)

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again,

$$\delta_h = -\frac{\partial E}{\partial y_h}\frac{\partial y_h}{\partial v_h} \qquad \frac{\partial y_h}{\partial v_h} = \varphi''(v_h)$$

$$-\frac{\partial E}{y_h} = -\Sigma e_f \frac{\partial e_f}{\partial y_h}$$

$$= \Sigma e_f \left[-\frac{\partial e_f}{\partial v_f}\right]\frac{\partial v_f}{\partial y_h}$$

here,

$$-\frac{\partial e_f}{\partial v_f} = \varphi'(v_f) \qquad \frac{\partial v_f}{\partial y_h} = w_{hf}$$

$$\therefore -\frac{\partial E}{\partial y_m} = \Sigma \delta_f w_{hf}$$

$$\delta_h = \varphi''(v_h)\Sigma \delta_f w_{hf} \quad \text{——(11)}$$

here,

$$\delta_p = -\frac{\partial E}{\partial y_p}\frac{\partial y_p}{\partial v_p} \qquad \frac{\partial y_R}{\partial v_p} = \varphi'''(v_p)$$

$$-\frac{\partial E}{y_p} = -\Sigma e_h \frac{\partial e_h}{\partial y_h}$$

$$\therefore \delta_p = \varphi'''(v_p)\Sigma \delta_h w_{ph}$$

$$= \varphi'''(v_p)\Sigma\left[\left(\varphi''(v_h)\Sigma \delta_f w_{hf}\right)\right] \cdot w_{ph}\Big] \quad \text{——(iii)}$$

[from (11)

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~~Ans~~

now, eqn ①,

$$\delta_m = \varphi'(v_m) \Sigma \left[\varphi'''(v_p) \Sigma \left\{ \left(\varphi''(v_h) \Sigma \delta_f \omega_{hf} \right) \cdot \omega_{ph} \right\} \cdot \omega_{pm} \right]$$

Ans: