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$E(w_0, w_1) = \sum (y - f(x; w_0, w_1))^2$ 가 최소

$E(w_0, w_1) = (1 - f(-1; w_0, w_1))^2 + (1 - (f(0; w_0, w_1))^2 + (1 - (f(1; w_0, w_1))^2 + (0 - (f(1; w_0, w_1))^2$

$$E(w_0, w_1) = (1 + w_1 - w_0)^2 + (1 - w_1 - w_0)^2$$
$$+ (1 + w_1 - w_0)^2 + (w_1 - w_0)^2$$

$$\frac{\partial E}{\partial w_0} = 2(4w_0 - 2w_1 - 3) \qquad = 0 \quad ; \quad \text{for min.}$$

$$\frac{\partial E}{\partial w_1} = 2(-2w_0 + 4w_1 + 1) \qquad = 0$$

$$\therefore w_0 = \frac{5}{6}, \quad w_1 = \frac{1}{6}$$

$$\therefore f_1(x) = \frac{1}{6} \cos \pi x + \frac{5}{6}$$

$E(w_0, w_1, w_2) = \Sigma(y - f(x; w_0, w_1, w_2))^2$ 가 최소

$E(w_0, w_1, w_2) = \left(1 - f(-1; w_0, w_1, w_2)\right)^2 + \left(1 - \left(f(0; w_0, w_1, w_2)\right)^2 + \left(1 - \left(f(1; w_0, w_1, w_2)\right)\right)^2 + \left(0 - \left(f(1; w_0, w_1, w_2)\right)\right)^2$

$E(W_0, W_1, W_2)$

$= \left(1 - \left(W_2 - W_1 + W_0\right)\right)^2 + \left(1 - W_0\right)^2 + \left(1 - \left(W_2 + W_1 + W_0\right)\right)^2$

$+ \left(0 - \left(W_2 + W_1 + W_0\right)\right)^2$

$\dfrac{\partial E}{\partial W_0} = 2\left(4W_0 + W_1 + 3W_2 - 3\right) \qquad = 0 \qquad for \quad min$

$\dfrac{\partial E}{\partial W_1} = 2\left(W_0 + 3W_1 + W_2\right) \qquad = 0$

$\dfrac{\partial E}{\partial W_2} = 2\left(3W_0 + W_1 + 3W_2 - 2\right) \qquad = 0$

$\therefore \quad W_0 = 1, \quad W_1 = -\dfrac{1}{4}, \quad W_2 = -\dfrac{1}{4}$

$\therefore \quad f_2(x) = -\dfrac{1}{4}x^2 - \dfrac{1}{4}x + 1$