

(حل تمرینی خانه) جلسہ اول، درس سوم

پاسخ تمرین جلسہ اول

$x_1$	$x_2$	$x_3$	$y$
1	0	1	2
2	1	0	3
1	0	2	1.5
3	2	0	4

$$W = \begin{bmatrix} 1,0 \\ 1 \\ 1,0 \end{bmatrix}$$

$$W_0 = 0$$

$$\hat{y} \leftarrow f(x) = x^T W + w_0 \quad (\text{حل اول})$$

$$x \quad w \quad \hat{y}$$

$$\begin{bmatrix} 1 & 0 & 1 \\ 2 & 1 & 0 \\ 1 & 0 & 2 \\ 3 & 2 & 0 \end{bmatrix} \times \begin{bmatrix} 1,0 \\ 1 \\ 1,0 \end{bmatrix} = \begin{bmatrix} 2 \\ 3 \\ 1,5 \\ 4 \end{bmatrix} \Rightarrow \text{output}$$

$$MSE = \frac{1}{n} \sum (y_i - \hat{y}_i)^2 \quad \text{کاہر خطا (Frobenius)}$$

$$MSE = \frac{1}{n} \left( (2-2)^2 + (3-3)^2 + (1.5-1.5)^2 + (4-4)^2 \right)$$

$$MSE = \frac{0}{4} = 0$$

کوچک خطا (Frobenius) کوچک خطا (Frobenius) کوچک خطا (Frobenius) کوچک خطا (Frobenius)

$$\textcircled{1} \quad \text{کوچک خطا (Frobenius)} = \frac{0}{4} = 0$$

$$\textcircled{2} \quad \text{کوچک خطا (Frobenius)} = \frac{0}{4} = 0 \Rightarrow$$

ASEMAN

$$\begin{cases} EW_1 = 1/4 \times 1,0 = 0,25 \\ EW_2 = 1/4 \times 1 = 0,25 \\ EW_3 = 1/4 \times 0 = 0,0 \end{cases}$$

Subject:  
Year. Month. Date. ( )

جديد (فرز فل)

$$\textcircled{1} \text{ (جديد) } \rightarrow w_{\text{new}} = \frac{w_{\text{old}} (E - \mu)}{E}$$

$M = .11$      $E = 150$

$$w_{\text{new}} = \left[ \begin{array}{c} w_i = \frac{1,0 * (150 - 0,11)}{150} = 1,9 \\ w_F = 1,9 \\ w_P = -0,1 \end{array} \right] \Rightarrow w_{\text{new}} = \left[ \begin{array}{c} 1,9 \\ 1,9 \\ -0,1 \end{array} \right]$$

$$\left[ \begin{array}{ccc} 1 & 0 & 1 \\ 1 & 1 & 0 \\ 1 & 0 & 1 \\ 1 & 1 & 0 \\ 1 & 0 & 1 \end{array} \right] \times \left[ \begin{array}{c} 1,9 \\ 1,9 \\ -0,1 \end{array} \right] = \left[ \begin{array}{c} 1,9 \\ 1,9 \\ 1,9 \\ 1,9 \\ 1,9 \end{array} \right] \Rightarrow \hat{y}$$

$$MSE = \frac{1}{k} (9,0) = 1,5V$$

\textcircled{2} (جديد) حساب  $w_{\text{new}}$

$$M = .11 \quad E = \left[ \begin{array}{c} EW_i = 15A \\ EW_F = 1,19 \\ EW_P = -0,9 \end{array} \right]$$

$$w_{\text{new}} = \left[ \begin{array}{c} w_i = \frac{1,0 * (15A - 1,1)}{15A} = 1,93 \\ w_F = 1,93 \\ w_P = -0,10 \end{array} \right] \Rightarrow w_{\text{new}} = \left[ \begin{array}{c} 1,93 \\ 1,93 \\ -0,10 \end{array} \right]$$

$$\hat{y} = \left[ \begin{array}{c} 1,93 \\ 1,93 \\ 1,93 \\ 1,93 \end{array} \right]$$

$$MSE = \frac{1}{k} (15,0) = 1,5V$$

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بازاریاں new مساحت

$$w_{new} = w_{old} - \left( \mu \times \frac{\partial e}{\partial w} \right)$$

$$\boxed{\mu = 11}$$

(شماره تکمیلی ۱)

$$w_1 = 1,0 - \left( 11 \times \frac{150 - 0}{110 - 0} \right) = 1,15$$

1,15

$$w_f = 1 - \left( 11 \times \frac{150 - 0}{1 - 0} \right) = 0,91 \Rightarrow w_{new}$$

0,91  
0,06

$$w_p = 1,0 - \left( 11 \times \frac{150 - 0}{10 - 0} \right) = 0,80$$

وزن ورقی تکمیلی ۱

$$w_1 = 1,0 - \left( 11 \times \frac{151 - 0}{110 - 0} \right) = 1,01$$

1,01

$$w_f = 1 - \left( 11 \times \frac{151 - 0}{1 - 0} \right) = 0,91 \Rightarrow w_{new}$$

0,91  
0,09

$$w_p = 1,0 - \left( 11 \times \frac{151 - 0}{10 - 0} \right) = 0,81$$

0,81