

# Assignment - 6

manual calculator

① Feed data (x, y)

x	y
7.6	157
7.1	174

② Data preprocessor using normalization...

x	y
0.428	0.537
0.190	0.612

③ Initialization  $m_1 = 1$ ;  $m_2 = 1$   $c = 1$

max iteration = 1000,  $\eta = 0.1$ , epoch = 1

④ Set iter = 1

⑤ Set sample = 1

⑥  $\frac{\partial E}{\partial m_1} = -0.1852$

⑦  $\frac{\partial E}{\partial m_2} = -0.3888$

⑧  $\frac{\partial E}{\partial m_3} = -0.97$

$$\Delta m_1 = -\eta \frac{\partial E}{\partial m_1} = -0.1 (-0.1852) = 0.0185$$

$$\Delta m_2 = 0.033$$

$$\Delta c = 0.32$$

$$\Delta c = 0.097$$

⑨  $m_1 = m_1 + \Delta m_1 = 1 + 0.0185$   
 $= 1.0185$

$$m_2 = 1.033 \quad c = -0.903$$



$$\textcircled{9} \quad \text{sample}(i) = i+1$$

$$i = 1+1 = 2$$

$$\textcircled{10} \quad \text{if } (\text{samples}(i) \leq n_s)$$

$$i \leftarrow (2 \leq 2) \rightarrow \text{step 5}$$

$$\underline{\underline{\text{sample} = 2}}$$

$$\frac{\partial \mathcal{E}}{\partial m_1} = -0.04624 ; \quad \frac{\partial \mathcal{E}}{\partial m_2} = 0.2431$$

$$\frac{\partial \mathcal{E}}{\partial c} = -1.281$$

$$\textcircled{11} \quad \Delta m_1 = 4.2 \times 10^{-3} ; \quad \Delta m_2 = 0.0243$$

$$\Delta c = 0.1281$$

$$\textcircled{12} \quad m_1 = m_1 + \Delta m_1 = 1.020$$

$$m_2 = 1.034 \quad c = -0.725$$

$$\text{sample}(i) = i+1$$

$$\text{if } \text{sample}(i) \leq n_s$$

$$\text{if } (3 \leq 2) \rightarrow \text{Next step.}$$

$$\textcircled{11} \quad \text{iter} = \text{iter} + 1$$

$$= 1+1 = 2$$

$$\textcircled{12} \quad \text{if } (\text{iter} \leq \text{epcons.})$$

$$\text{if } (x \leq 1) \rightarrow \text{Next step}$$

$$\textcircled{13} \quad \text{stop}$$

$$\text{print } m \text{ and } c$$

$$m = 1.020 ; 1.04$$

$$c = -0.7775.$$