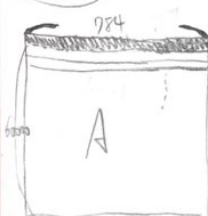


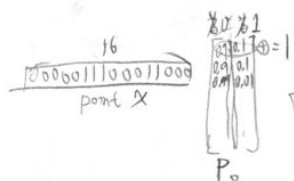
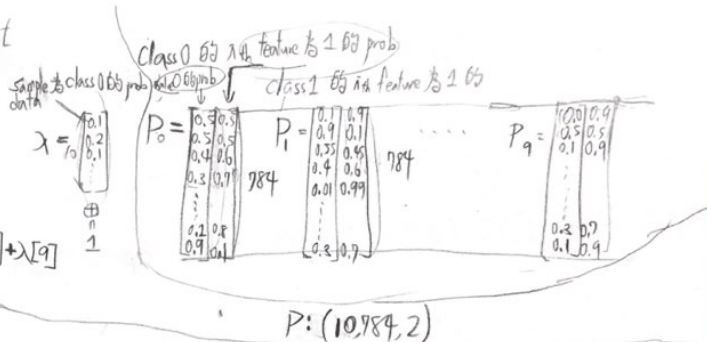
E-step



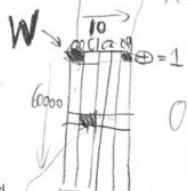
$$P(C_0|x) = \frac{P(x|C_0)P(C_0)}{P(x)} = \frac{P(x_1|C_0)P(x_2|C_0) \dots P(x_{784}|C_0)P(C_0)}{P(x)}$$

$$\log \rightarrow \frac{\sum_{i=1}^{784} [P_0^x (1-P_0)^{1-x}] + \lambda[0]}{P(x)}$$

$$\frac{\sum_{i=1}^{784} [P_0^x (1-P_0)^{1-x}] + \lambda[0]}{P(x)}$$



concept



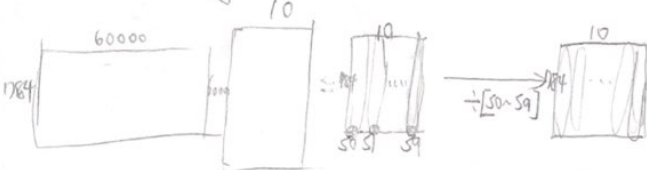
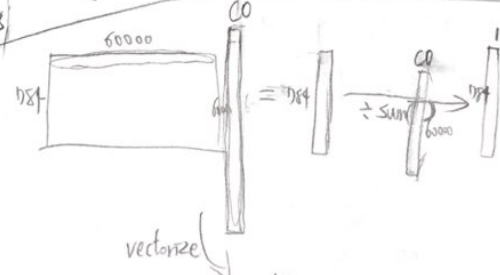
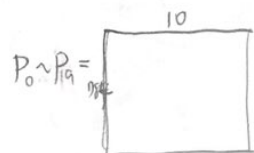
$$O(60000 \times 10 \times 784) = O(4 \times 10^8)$$

共须 $A \cdot \lambda \cdot P \cdot W$
四 16 matrix

$$\textcircled{1} \sum_{k=1}^K \log(\max(1e-8, P[k][i][x[i]])) + \log(\lambda[k])$$

$$\textcircled{2} \text{normalize align} \rightarrow \text{axis}$$

M-step



$$= [c_0 \ c_1 \ c_2 \ \dots \ c_9]$$

normalize & transpose

$$= \begin{bmatrix} c_0 \\ c_1 \\ \vdots \\ c_9 \end{bmatrix}$$