

HW 2

89/12/18

Salary: $> 50k$ $\leq 50k$
 train: ~~43/58~~ \swarrow 10% validation
 Test: ~~4884~~ \searrow 90% training data.

SVM / Stochastic Gradient Descent /
 ignore id number / scale - unit variance /
 Subtract mean / regularization constant $[10^{-3}, 10^{-2}, 10^{-1}, 1]$
 50 epochs - 300 steps each /

① 数据预处理

② 归一化 unit variance & zero mean

③ 循环

④ 梯度下降

5 (lambda)

50 (epoch)

300 (step)

公式:

$$\text{cost function: } g(w) = \left[\frac{1}{N} \sum_{i=1}^N g_i(w) \right] + g_0(w)$$

$$= \left[\frac{1}{N} \sum_{i=1}^N \max(0, 1 - y_i(a^T x_i + b)) \right] + \frac{\lambda}{2} \|a\|^2$$

$$\max(0, 1 - y_i(a^T x_i + b)) + \frac{\lambda}{2} \|a\|^2$$

$$\Rightarrow a^{n+1} = a^n - \eta \begin{cases} \lambda a & \text{if } y_i(a^T x_i + b) \geq 1 \\ \lambda a - y_i x_i & \text{otherwise} \end{cases}$$

$$b^{n+1} = b^n - \eta \begin{cases} 0 & \text{if } y_i(a^T x_i + b) \geq 1 \\ 1 - y_i & \text{otherwise} \end{cases}$$

$$\text{step length: } \frac{1}{0.01 * \text{epoch} + 50}$$

$$\lambda = [10^{-3}, 10^{-2}, 10^{-1}, 1]$$

