

朴素贝叶斯

条件独立性假设: $P(x|y) = \prod_{j=1}^p P(x_j|y)$ 联合概率

Data: $\{(x_i, y_i)\}_{i=1}^N$ $x_i \in \mathbb{R}^p$ $y_i \in \{0, 1\}$

给定 $x \rightarrow y$ 是 0?

$$\hat{y} = \arg \max_y P(y|x) = \arg \max_{y \in \{0, 1\}} \frac{P(x, y)}{P(x)}$$

$$P(y|x) = \frac{P(x, y)}{P(x)} = \frac{P(y) P(x|y)}{P(x)} \propto P(y) P(x|y)$$

$$= \arg \max_y P(y) \cdot P(x|y)$$

二分类: 0/1 \rightarrow 伯努利分布

多分类: 类别分布

$P(x_j|y) \begin{cases} \text{离散} \rightarrow x_j \Rightarrow \text{Categorical Distribution} \\ \text{连续} \rightarrow x_j \Rightarrow \mathcal{N}(\mu_i, \sigma_i^2) \end{cases}$