

3) how to find nests +

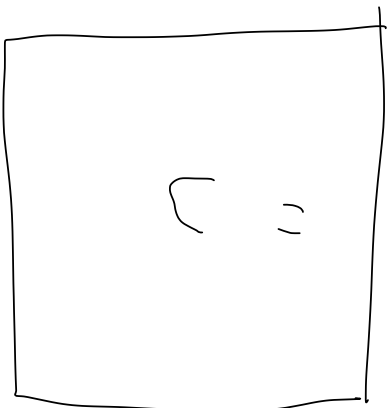
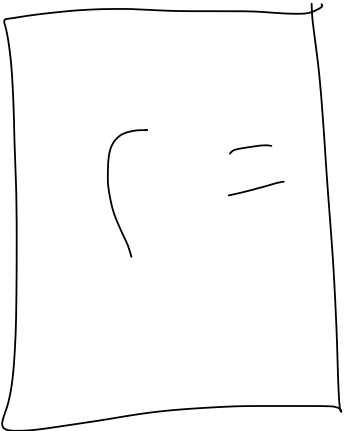
a) brute force RN

b) tree

c) approximate nest reshuffle

Scaling

$$\frac{V - V_{min}}{V_{max} - V_{min}}$$



Naive Bayes

$P(y | \vec{x})$ - choose y with
max

Bayes rule

$$\underbrace{P(y | \vec{x})}_{\text{posterior}} = \frac{\overbrace{P(\vec{x} | y)}^{\text{likelihood}} \underbrace{P(y)}^{\text{prior}}}{P(\vec{x})}$$

"Naïve" assumption

$\vec{x}^{(i)}$: i -th feature vector
 $x^{(i)}$: i -th element of

feature vector

$$P(\vec{x} | y) = P(x^{(1)} | y) P(x^{(2)} | y) \dots P(x^{(n)} | y) \\ = \prod_i P(x^{(i)} | y)$$

$$\sum \rightarrow \text{sum} \\ \prod \rightarrow \text{multiply}$$

$$P(Y|\vec{X}) = \frac{\left(\prod_i P(X^{(i)}|Y) \right) P(Y)}{P(\vec{X})}$$

$$\propto \left(\prod_i P(X^{(i)}|Y) \right) P(Y)$$

proportional to

$$\propto P(Y) \prod_i P(X^{(i)}|Y)$$

$$P(\text{accident} | \text{rain})$$

$$P(\text{umbrella} | \text{rain})$$

Choose class with largest $\underbrace{P(Y|\vec{x})}$

$$\prod \frac{P(X^{(y)}|y)}{P(Y)}$$

MAP

maximum a posteriori

$$\underbrace{P(Y|\vec{x})}_{\text{posterior}}$$

$$P(Y == c) = \frac{\# \text{ of samples with class } c}{\# \text{ of samples}}$$

$$= \sum_{i=0}^{N-1} \delta(y_i == c)$$

$$P(X^{(i)} == t \mid Y == c) = \frac{\# \text{ of times } j^{\text{th}} \text{ attribute } t \text{ and } y \text{ was } c}{\# \text{ of samples with class } c}$$

$$= \sum_{i=0}^{N-1} \delta(X_i^{(j)} == t \wedge y_i == c)$$

$$\frac{\sum_{i=0}^{N-1} \delta(y_i == c)}{\sum_{i=0}^{N-1} \delta(y_i == c)}$$

$$p(y) \prod p(x|y)$$

$$\log(ab) = \log(a) + \log(b)$$

