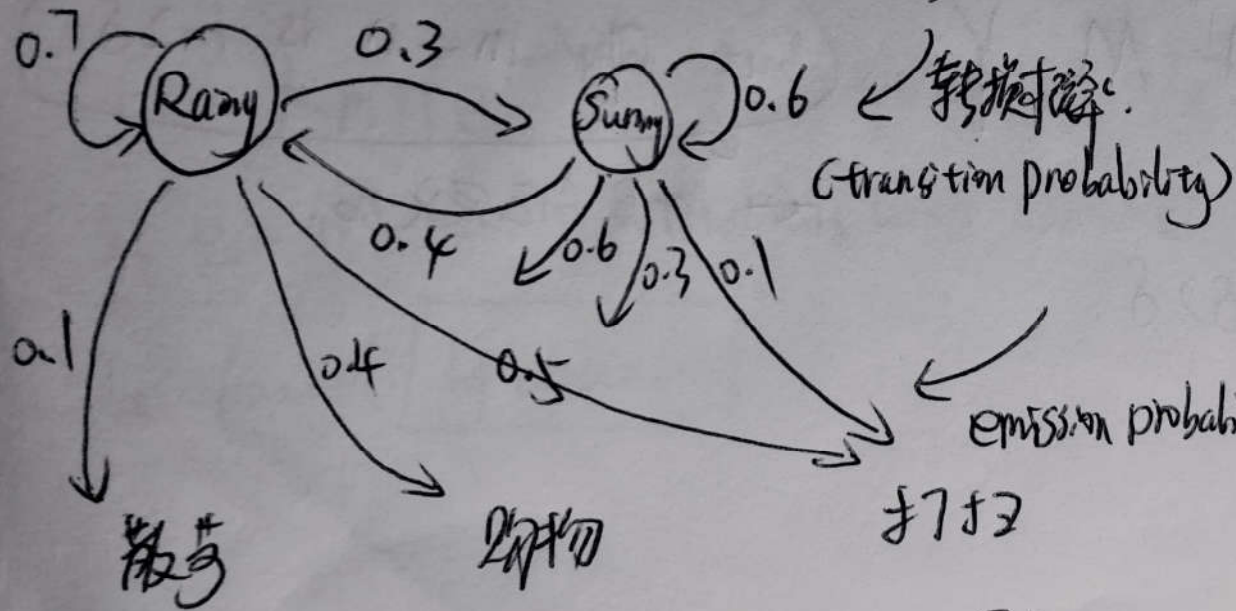


隐状态 = {下雨, 天晴}

观测 = {散步, 购物, 打扫}



~~Emission probability~~

观察到的 token path 是
① 散步 ② 购物 ③ 打扫
求 3 天的 state path.

dynamic programming

$$P_1(\text{Rainy} | \text{散步}) < P_1(\text{Sunny} | \text{散步})$$

0.1 0.6

$$P_2(\text{Rainy} | \text{购物}) > P_2(\text{Sunny} | \text{购物})$$

0.4 0.3

$$P_3(\text{Rainy} | \text{打扫}) > P_3(\text{Sunny} | \text{打扫})$$

0.5 0.1

这 3 天很可能的天气顺序
是 Sunny → Rainy → Rainy

Re-calculate,

← 这应该就是和dynamic programming 类似的
viterbi 算法

$$\therefore P_1(\text{Rainy})(\text{初始}) = 0.4, P_1(\text{Sunny})(\text{初始}) = 0.6, \text{ so } P_1 = \text{Sunny}, = 0.6$$

$$P_1 \times P_2(\text{Sunny} \rightarrow \text{Sunny}) \times 0.3 = 0.6 \times 0.6 \times 0.3 = 0.108. \quad \left. \begin{array}{l} \\ \end{array} \right\} P_2 = \text{Sunny} = 0.108.$$

$$P_1 \times P_2(\text{Sunny} \rightarrow \text{Rainy}) \times 0.4 = 0.6 \times 0.4 \times 0.4 = 0.096$$

$$P_1 \times P_2 \times P_3(\text{Sunny} \rightarrow \text{Sunny}) \times 0.1 = 0.6 \times 0.108 \times 0.6 \times 0.1 = 0.003888 \quad \left. \begin{array}{l} \\ \end{array} \right\} P_3 = \text{Rainy} = 0.01296.$$

$$P_1 \times P_2 \times P_3(\text{Sunny} \rightarrow \text{Rainy}) \times 0.5 = 0.6 \times 0.108 \times 0.4 \times 0.5 = 0.01296$$

故这3天很可能的天气顺序为

Sunny \rightarrow Sunny \rightarrow Rainy