

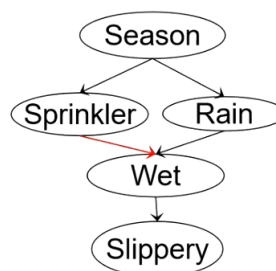
第十一周作业

第一题

Bayesian Networks 三种常用的推理方式

- Bayesian networks通过父子传递可以在任何一个方向上推理

- 1) If the sprinkler is on, the sidewalk is probably wet (prediction预测)
- 2) If the sidewalk is wet, it is more likely that the sprinkler is on or it is raining (diagnosis诊断)
- 3) If the sidewalk is wet and the sprinkler is on, the likelihood that it is raining is reduced (explaining away解释远离, 消解影响)



- Explaining away is a special type of reasoning that is especially difficult to model in other network models

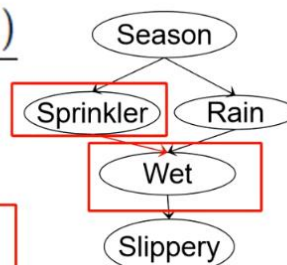
解释远离

$$P(r|w, s) = \frac{P(w|r, s)P(r|s)}{P(w|s)}$$

如果

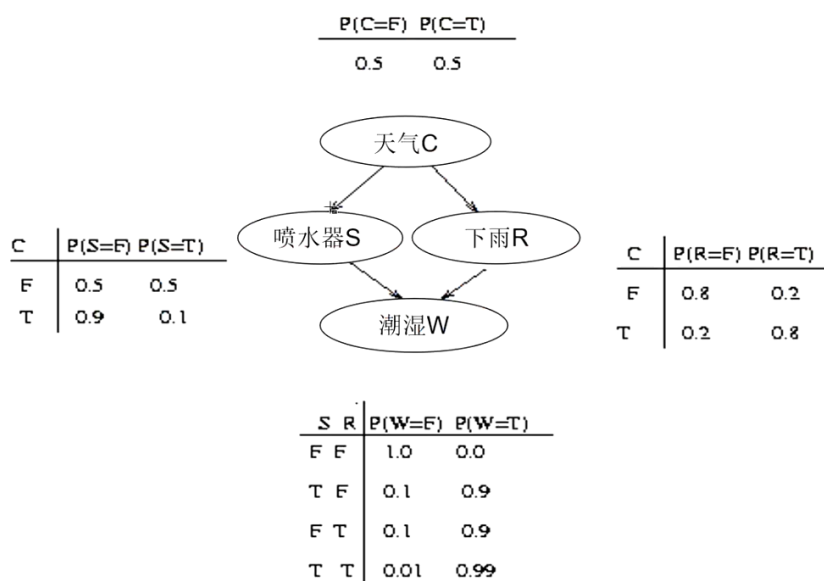
$$P(w|s) = P(w|r, s)$$

$$P(r|w, s) = P(r|s) = P(r)$$



这说明S决定了W的发生, R则发生了对W的解释远离

Bayesian Network的分布表

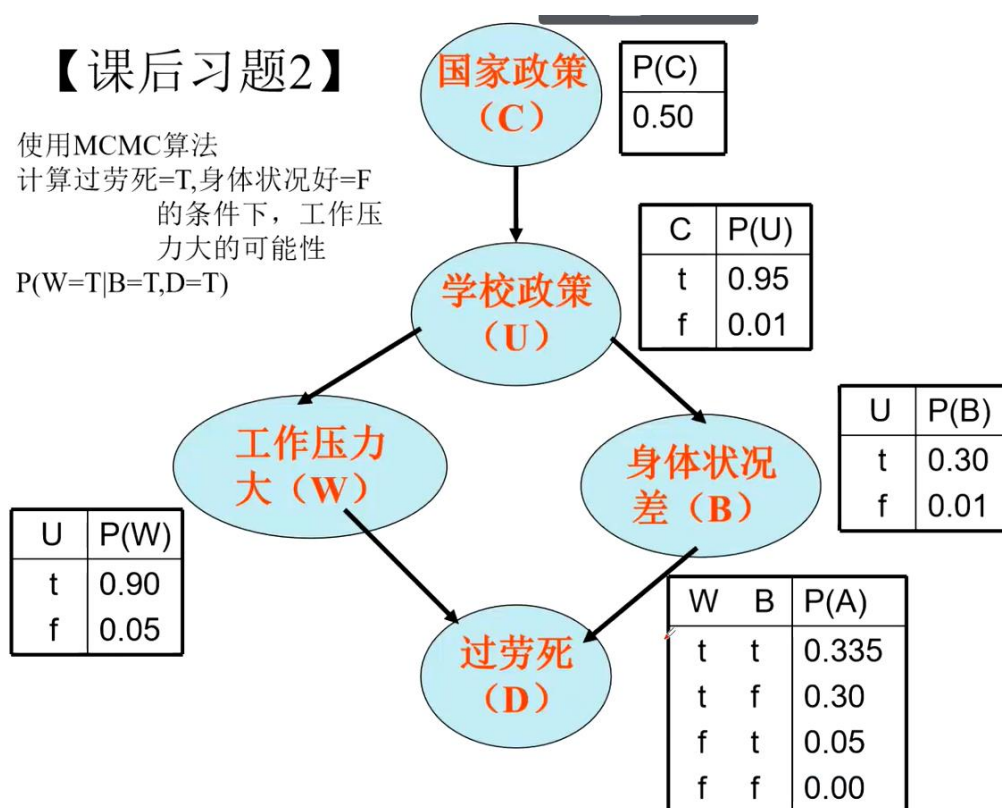


计算并判断 R 对 S 是否发生解释远离

第二题

【课后习题2】

使用MCMC算法
 计算过劳死=T,身体状况好=F
 的条件下,工作压力大的可能性
 $P(W=T|B=T,D=T)$



计算一位老师过劳死, 身体状况好的条件下工作压力大的可能性

【Ps: 以上两题均要求 python 程序计算】