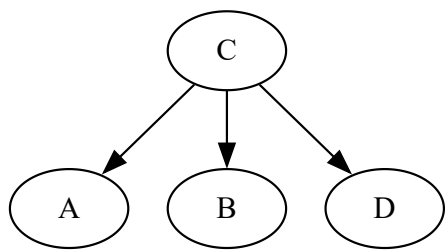# 理论作业二

一

(1)不独立　　(2)不独立　(3)不独立　　(4)不独立　(5)独立
(6)独立　　　　(7)独立　(8)不独立　　(9)独立　(10)不独立
(11)不独立

二

三

由图可知:

$$P(E, S, M, B) = P(E) \cdot P(S|E, M) \cdot P(M) \cdot P(B|M)$$

(1)

因此:

$$P(E = F, S = F, M = F, B = F) = 0.6 \cdot 0.9 \cdot 0.9 \cdot 0.9 = 0.4374$$

(2)

B与E, S独立。

$$P(B = T) = P(M = T, B = T) + P(M = F, B = T)$$
$$= 1.0 \cdot 0.1 + 0.1 \cdot 0.9 = 0.19$$

(3)

$$P(M = T|B = T) = \frac{P(B = T|M = T) \cdot P(M = T)}{P(B = T)}$$

$$= \frac{1.0 \cdot 0.1}{0.19} = 0.5263$$

(4)

$$P(M = T|E = T, S = T, B = T) = \frac{P(M = T, E = T, S = T, B = T)}{P(E = T, S = T, B = T)}$$

$$= \frac{P(M = T, E = T, S = T, B = T)}{P(M = T, E = T, S = T, B = T) + P(M = F, E = T, S = T, B = T)}$$

$$= \frac{0.4 \cdot 0.1 \cdot 1.0 \cdot 1.0}{0.4 \cdot 0.1 \cdot 1.0 \cdot 1.0 + 0.4 \cdot 0.9 \cdot 0.8 \cdot 0.1}$$

$$= 0.5814$$

(5)

E, M独立，故：

$$P(E = T|M = T) = \frac{P(E = T, M = T)}{P(M = T)}$$

$$= \frac{P(E = T) \cdot P(M = T)}{P(M = T)}$$

$$= P(E = T) = 0.4$$