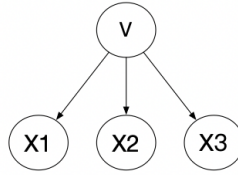


解答:

a) 其贝叶斯网络如下, 其中 V 是我们的随机变量 (确定选择 a,b 还是 c):



其有两个 CPT, 如下:

选择每一个硬币的概率:

V	P(V)
a	1/3
b	1/3
c	1/3

选择每一枚硬币是头的概率:

V	P(X= heads V)
a	0.2
b	0.6
c	0.8

b) 我们有: AIM = two of heads and one of tail

$$P(V|AIM) = \frac{P(AIM|V)P(V)}{P(AIM)} \propto P(AIM|V)$$

$V=a$ 即有:

$$\begin{aligned} p(AIM|V=a) &= 3 * P(X_1 = tail, X_2 = head, X_3 = head|V=a) \\ &= 3 * 0.8 * 0.2 * 0.2 = 0.096 \end{aligned}$$

$V=b$ 即有:

$$\begin{aligned} p(AIM|V=b) &= 3 * P(X_1 = tail, X_2 = head, X_3 = head|V=b) \\ &= 3 * 0.4 * 0.6 * 0.6 = 0.432 \end{aligned}$$

$V=c$ 即有:

$$\begin{aligned} p(AIM|V=c) &= 3 * P(X_1 = tail, X_2 = head, X_3 = head|V=c) \\ &= 3 * 0.2 * 0.8 * 0.8 = 0.384 \end{aligned}$$

所以从概率上看, b 是最有可能被抽取的。