

Biometry - Clex5 - Solutions

1) a) $P(A|B) = \frac{P(A \cap B)}{P(B)} = \frac{55}{80} = 0.688$

68.8% of women with MI episode smoke.

$P(B|A) = \frac{P(A \cap B)}{P(A)} = \frac{55}{120} = 0.458$

45.8% of women who smoke have MI episode

$P(A|B^c) = \frac{P(A \cap B^c)}{P(B^c)} = \frac{65}{190} = 0.342$

34.2% of women with no MI episode smoke

b) $P(B) = \frac{80}{270} = 0.296 \neq P(B|A) = 0.458$; A and B are dependent.

2) a) A - Ace; K - King; $A \cap K = \emptyset$, A and K are disjoint

b) A - Ace; H - hearts; A and H are independent since

$P(A) = \frac{4}{52} = \frac{1}{13}$; $P(A|H) = \frac{1}{13}$

3) a) $P(H|B) = \frac{P(H \cap B)}{P(B)} = \frac{10}{120} = \frac{1}{12} \approx 0.083$

$P(H|O) = \frac{P(H \cap O)}{P(O)} = \frac{24}{75} = 0.32$

b) $P(B|H) = \frac{P(H \cap B)}{P(H)} = \frac{10}{100} = 0.1$

$P(B|O) = \frac{P(B \cap O)}{P(O)} = \frac{44}{75} \approx 0.587$

c) $P(H) = \frac{100}{250} = 0.4 \neq P(H|B) = 0.083$ Dependent.

In the presence of bees, hummingbirds visit less often.

d) $P(H) = 0.4 \neq P(H|O) = 0.32$ Dependent.

In the presence of others, hummingbirds visit less often.

e) $P(B) = \frac{120}{250} = 0.48 \neq P(B|O) = 0.587$ Dependent.

Bimelby - Clex 5 - solutions

4)

	+	-	
Inf	34	6	40
Not Inf	96	864	960
	130	870	1000

$$P(\text{Inf} | +) = \frac{34}{130} = 0.262$$

$$P(\text{Inf} | -) = \frac{6}{870} = 0.007$$