F14076083 魏湧致

2.66

(a) (2+30) / 100 = 0.32

(b) (32+25+30) / 100 = 0.87

(c) (5+6+2) / 100 = 0.13

(d) (6+25+2+30) / 100 = 0.63

2.82

P(h)=0.2 P(w)=0.28 P(h∩w)=0.15

(a) P(h) + P(w) - P(h∩w) = P(h∪w) = 0.2 + 0.28 - 0.15 = 0.33

(b) P(w|h) = P(h∩w)/P(h) = 0.15/0.2 = 0.75

(c) P(h|w') = P(h∩w')/P(w') = $\frac{\mathrm{P(h)-P(h\cap w)}}{1-P(w)}$ = $\frac{0.05}{0.28}$ = $\frac{5}{28}$

2.90

(a) P(C|A∩B) = $\frac{p(A\cap \mathrm{B}\cap \mathrm{C})}{P(A\cap \mathrm{B})}$ = 0.20 P(B|A) = $\frac{P(A\cap \mathrm{B})}{P(A)}$ = 0.75 P(A) = 0.3

P(A∩B∩C) = 0.20 * (0.75*0.3) = 0.045

(b) P(B' ∩ C) = P(A ∩ (B' ∩ C)) + P(A' ∩ (B' ∩ C)) = P(A) * P(B'|A) * P(C|A∩B') + P(A') * P(B'|A') * P(C|A'∩B') = 0.3*(1-P(B|A))*0.8 + (1-0.3)*(1-P(B|A'))*0.9 = 0.3*0.25*0.8 + 0.7*0.8*0.9 = 0.564

(c) P(C) = P((A∩B) ∩ C) + P((A∩B') ∩ C) + P((A'∩B) ∩ C) + P((A'∩B') ∩ C)

P((A∩B) ∩ C) = 0.045 P((A∩B') ∩ C) = 0.06 P((A'∩B') ∩ C) = 0.504

P((A'∩B) ∩ C) = P(C|A'∩B) * P(A'∩B) = 0.15 * 0.14 = 0.021

P(C) = 0.045 + 0.06 + 0.021 + 0.504 = 0.63

(d) P(A|B'∩C) = $\frac{\mathrm{P(A\cap B'\cap C)}}{\mathrm{P(B'\cap C)}}$ = 0.06 / 0.564 = $\frac{5}{47}$

2.100

令 S 為 problems with electricity supplied, C 為 computer malfunction, E 為 malfunctioning electrical equipment, H 為 hunam errors

P(A) = (2+4+5+7) / 43= $\frac{18}{43}$ P(B) = (1+3+4+7) / 43= $\frac{15}{43}$ P(C) = (1+2+2+5) / 43= $\frac{10}{43}$

P(H|A) = $\frac{7}{18}$ P(H|B) = $\frac{7}{15}$ P(H|C) = $\frac{5}{10}$ = $\frac{1}{2}$

P(C|H) = $\frac{P(C\cap \mathrm{H})}{P(H)}$ = $\frac{P(H|C)*P(C)}{P(A\cap \mathrm{H})+P(B\cap \mathrm{H})+P(C\cap \mathrm{H})}$

$$=\frac{0.5*\frac{10}{43}}{P(H|A)*P(A)+P(H|B)*P(B)+P(H|C)*P(C)}$$

$$=\frac{0.5*\frac{10}{43}}{\frac{7}{43}+\frac{7}{43}+\frac{5}{43}}=\frac{5}{19}$$

2.126

令 U 為 union, U'為 nonunion, S 為 same company, N 為 new company, F 為 new filed, Un 為 unemployed

(a) P(U|N) = $\frac{P(U\cap \mathrm{N})}{P(N)}$ = $\frac{13/100}{23/100}$ = $\frac{13}{23}$

(b) P(Un|U) = $\frac{P(Un\cap \mathrm{U})}{P(U)}$ = $\frac{2/100}{59/100}$ = $\frac{2}{59}$