

$$P(A|B) = \frac{P(A \cap B)}{P(B)} \quad P(B|A) = \frac{P(B \cap A)}{P(A)}$$

$$P(A \cap B) = P(B \cap A)$$

$P(A) > P(B)$ because event B is more specific and narrower compared to the event A. Therefore $P(A|B)$ is larger.

So, a. 0.05

b. $0.05 + 0.07 = 0.12$

c. short-sleeved shirt = $0.04 + 0.02 + 0.05 + 0.08 + 0.07 + 0.12 + 0.03 + 0.07 + 0.08 = 0.56$

long-sleeved shirt = $1 - 0.56 = 0.44$

d. Medium: $0.02 + 0.07 + 0.12 + 0.1 + 0.05 + 0.07 = 0.47$

print: $0.02 + 0.07 + 0.07 + 0.02 + 0.05 + 0.02 = 0.25$

e. $P(M|SSAPI) = \frac{P(M \cap SSAPI)}{P(SSAPI)} = \frac{0.08}{0.04 + 0.08 + 0.03} = 0.533$

f. $P(SS|M \cap PI) = \frac{P(SS \cap M \cap PI)}{P(M \cap PI)} = \frac{0.08}{0.08 + 0.1} = 0.444$

$P(LS|M \cap PI) = \frac{0.1}{0.08 + 0.1} = 0.556$

52. $P(A \cup B|C) = P(A|C) + P(B|C) - P(A \cap B|C)$

$P(A \cup B|C) = \frac{P((A \cup B) \cap C)}{P(C)}$

$= \frac{P((A \cap C) \cup (B \cap C))}{P(C)}$

$= \frac{P(A \cap C)}{P(C)} + \frac{P(B \cap C)}{P(C)} - \frac{P((A \cap C) \cap (B \cap C))}{P(C)}$

$= P(A|C) + P(B|C) - P(A \cap B|C)$

63. a. $P(A) = 0.75$

$P(A') = 1 - 0.75 = 0.25$

$P(B|A) = 0.9$

$P(B'|A) = 1 - P(B|A) = 0.1$

$P(B|A') = 0.8$

$P(B'|A') = 1 - P(B|A') = 0.2$

$P(C|A \cap B) = 0.8$

$P(C'|A \cap B) = 0.2$

$P(C|A \cap B') = 0.6$

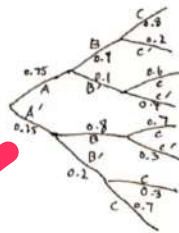
$P(C'|A \cap B') = 0.4$

$P(C|A' \cap B) = 0.7$

$P(C'|A' \cap B) = 0.3$

$P(C|A' \cap B') = 0.3$

$P(C'|A' \cap B') = 0.7$



b. $P(B|A) = P(B|A) \cdot P(A) = 0.9 \times 0.75 = 0.675$

$P(C|A \cap B) = \frac{P(A \cap B \cap C)}{P(A \cap B)}$

$P(A \cap B \cap C) = P(C|A \cap B) \cdot P(A \cap B)$

$= 0.8 \cdot 0.675$

$= 0.54$

c. $P(B \cap C) = P(B \cap C \cap A) + P(B \cap C \cap A')$

$= 0.54 + 0.3 \cdot 0.7 \cdot 0.25$

$= 0.68$

d. $P(C) = P(A \cap B \cap C) + P(A' \cap B \cap C) + P(A \cap B' \cap C) + P(A' \cap B' \cap C)$

$= 0.54 + 0.14 + 0.75 \cdot 0.1 \cdot 0.6 + 0.25 \cdot 0.2 \cdot 0.3$

$= 0.54 + 0.14 + 0.045 + 0.015$

$= 0.74$

e. $P(A|B \cap C) = \frac{P(A \cap B \cap C)}{P(B \cap C)}$

$= \frac{0.54}{0.68}$

$= 0.7941$