Page 55 #5

$$
\begin{aligned}
a &: A = \{FSS, SFS, SSF\} \\
b &: B = \{FSS, SFS, SSF, SSS\} \\
c &: C = \{SSS, SFS, SSF\} \\
d &: C' = \{FFF, SFF, FSF, FFS, FSS\} \\
&\quad A \cup C = \{SSS, SFS, SSF, FSS\} \\
&\quad A \cap C = \{SFS, SSF\} \\
&\quad B \cup C = \{FSS, SFS, SSF, SSS\} \\
&\quad B \cap C = \{SSS, SFS, SSF\}
\end{aligned}
$$

Page 65 #23

$a: P(A_M \cap H_H) = 0.10$

$b: P(A_L) = 0.04 + 0.05 + 0.06 + 0.03 = 0.18$

$P(H_L) = 0.06 + 0.10 + 0.03 = 0.19$

$c: P(A = H) = (A_L \cap H_L) + P(A_M \cap H_M) + P(A_H \cap H_H)$

$= 0.06 + 0.20 + 0.15$

$= 0.41$

$d: P(A \neq H) = 1 - P(A = H) = 1 - 0.41 = 0.59$

$e: P(L) = P(A_L \cup H_L) = P(A_L) + P(H_L) - P(A_L \cap H_L)$

$= 0.18 + 0.19 - 0.06 = 0.31$

$f: P(\neg L) = 1 - P(L) = 1 - 0.31 = 0.69$

Page 82 #50

$a: P(L \cap Pr \cap M) = 0.05$

$b: P(M \cap Pr) = P(L \cap Pr \cap M) + P(S \cap Pr \cap M) = 0.05 + 0.07 = 0.12$

$c: P(S) = 0.04 + 0.02 + 0.05 + 0.08 + 0.07 + 0.12 + 0.03 + 0.07 + 0.08 = 0.56$

$P(L) = 1 - P(S) = 1 - 0.56 = 0.44$

$d: P(M) = 0.08 + 0.07 + 0.12 + 0.10 + 0.05 + 0.07 = 0.49$

$P(Pr) = 0.02 + 0.07 + 0.07 + 0.02 + 0.05 + 0.02 = 0.25$

$e: P(M|S \cap Pl) = \dfrac{P(M \cap S \cap Pl)}{P(S \cap Pl)} = \dfrac{0.08}{0.04 + 0.08 + 0.03} = \dfrac{8}{15}$

$f: P(S|M \cap Pl) = \dfrac{P(S \cap M \cap Pl)}{P(M \cap Pl)} = \dfrac{0.08}{0.08 + 0.10} = \dfrac{4}{9}$

$P(L|M \cap Pl) = 1 - P(S|M \cap Pl) = 1 - \dfrac{4}{9} = \dfrac{5}{9}$

Page 84 #65

$$
\begin{aligned}
&P(L_1 \cap \#1) = P(L_1|\#1)P(\#1) \\
&= (0.3 \times (1 - 0.1) + (1 - 0.3) \times 0.1)(0.5) = 0.17 \\
&P(L_1 \cap \#2) = P(L_1|\#2)P(\#2) \\
&= (0.25 \times (1 - 0.2) + (1 - 0.25) \times 0.2)(0.3) = 0.105 \\
&P(L_1 \cap \#3) = P(L_1|\#3)P(\#3) \\
&= (0.40 \times (1 - 0.25) + (1 - 0.40) \times 0.25)(0.2) = 0.09 \\
&P(L_1) = P(L_1 \cap \#1) + P(L_1 \cap \#2) + P(L_1 \cap \#3) \\
&= 0.17 + 0.105 + 0.09 = 0.365 \\
&P(\#1|L_1) = \frac{P(L_1 \cap \#1)}{P(L_1)} = \frac{0.17}{0.365} \approx 0.4658 \\
&P(\#2|L_1) = \frac{P(L_1 \cap \#2)}{P(L_1)} = \frac{0.105}{0.365} \approx 0.2878 \\
&P(\#3|L_1) = \frac{P(L_1 \cap \#3)}{P(L_1)} = \frac{0.09}{0.365} \approx 0.2466
\end{aligned}
$$

Page 89 #71

$$P(0_{0.1}) = (1 - 0.1)^{10} = 0.348678$$
$$P(1_{0.1}) = (1 - 0.1)^{9} \times 0.1 = 0.038742$$
$$P(0_p) = (1 - p)^n$$
$$P(1_p) = (1 - p)^{n-1} \cdot p$$

Page 91 #85

$$a: P(L_1) = \frac{500}{500+400+600} = \frac{1}{3}$$
$$P(C) = \frac{0.5 \times 500 + 0.44 \times 400 + 0.40 \times 600}{1500} = \frac{666}{1500} = 0.444$$
$$b: P(B|L_1) = \frac{P(B \cap L_1)}{P(L_1)} = 0.15$$
$$c: P(L_1|S) = \frac{P(L_1 \cap S)}{P(S)} = \frac{0.1 \times \frac{1}{3}}{\frac{0.1 \times 500 + 0.08 \times 400 + 0.15 \times 600}{1500}} \approx 0.2907$$