

Aufgabe 5.3

a) Apriori-Wahrscheinlichkeiten

$$P(G_A) = P(G_{A1} \cap G_{A2}) \stackrel{(5.22)}{=} P(G_{A1}) \cdot P(G_{A2}) = 0,8 \cdot 0,7 = \mathbf{0,56}$$

$$P(G_B) = P(G_{B1} \cap G_{B3}) \stackrel{(5.22)}{=} P(G_{B1}) \cdot P(G_{B3}) = 0,2 \cdot 0,4 = \mathbf{0,08}$$

$$P(G_C) = P(G_{C2} \cap G_{C3}) \stackrel{(5.22)}{=} P(G_{C2}) \cdot P(G_{C3}) = 0,3 \cdot 0,6 = \mathbf{0,18}$$

$$P(L) \stackrel{(5.14)}{=} 1 - P(G_A \cup G_B \cup G_C) \stackrel{(5.13)}{=} 1 - (0,56 + 0,08 + 0,18) = \mathbf{0,18}$$

$$P(L_A) = P(L_B) = P(L_C) = \frac{P(L)}{3} = \frac{0,18}{3} = 0,06$$

$$P(S_A) = P(G_A \cup L_A) \stackrel{(5.13)}{=} 0,56 + 0,06 = \mathbf{0,62}$$

$$P(S_B) = P(G_B \cup L_B) \stackrel{(5.13)}{=} 0,08 + 0,06 = \mathbf{0,14}$$

$$P(S_C) = P(G_C \cup L_C) \stackrel{(5.13)}{=} 0,18 + 0,06 = \mathbf{0,24}$$

b) Aposteriori-Wahrscheinlichkeiten

$$P(G_A | G_{B1}) \stackrel{(5.20)}{=} \frac{P(G_A \cap G_{B1})}{P(G_{B1})} = \frac{P(\{\})}{P(G_{B1})} \stackrel{(5.15)}{=} \mathbf{0}$$

$$P(G_B | G_{B1}) \stackrel{(5.20)}{=} \frac{P(G_B \cap G_{B1})}{P(G_{B1})} = \frac{P(G_B)}{P(G_{B1})} \stackrel{a)}{=} P(G_{B3}) = \mathbf{0,4}$$

$$P(G_C | G_{B1}) = P(G_C) = \mathbf{0,18}$$

(G_C und G_{B1} sind stochastisch unabhängig!)

$$P(L | G_{B1}) \stackrel{(5.13)}{\stackrel{(5.14)}{=}} 1 - (0 + 0,4 + 0,18) = \mathbf{0,42}$$

$$P(L_A | G_{B1}) = P(L_B | G_{B1}) = P(L_C | G_{B1}) = \frac{P(L | G_{B1})}{3} = \frac{0,42}{3} = 0,14$$

$$P(S_A | G_{B1}) = P(G_A \cup L_A | G_{B1}) \stackrel{(5.13)}{=} 0 + 0,14 = \mathbf{0,14}$$

$$P(S_B | G_{B1}) = P(G_B \cup L_B | G_{B1}) \stackrel{(5.13)}{=} 0,40 + 0,14 = \mathbf{0,54}$$

$$P(S_C | G_{B1}) = P(G_C \cup L_C | G_{B1}) \stackrel{(5.13)}{=} 0,18 + 0,14 = \mathbf{0,32}$$