

4.27

- a. $P(\text{both customers pay in full}) = (0.70)(0.70) = 0.49$
- b. $P(\text{at least one of two customers pay in full}) = 1 - P(\text{neither customer pays in full})$
 $= 1 - (1 - 0.70)(1 - 0.70) = 1 - (0.30)^2 = 1 - 0.09 = 0.91$

4.28 Let A = event customer pays first month's bill in full and B = event customer pays second month's bill in full. We are given that

$$P(A) = 0.70, P(B|A) = 0.95, P(B|\bar{A}) = 0.10, P(\bar{B}|\bar{A}) = 1 - P(B|\bar{A}) = 0.90$$

- a. $P(A \cap B) = P(B|A)P(A) = (0.95)(0.70) = 0.665$
- b. $P(\bar{A} \cap \bar{B}) = P(\bar{B}|\bar{A})P(\bar{A}) = (0.90)(1 - 0.70) = 0.270$
- c. $P(\text{pay exactly one month in full}) = 1 - P(\text{pays neither month or pays both months})$
 $= 1 - P(\bar{A} \cap \bar{B}) - P(A \cap B) = 1 - 0.665 - 0.270 = 0.065$

4.31

$$P(D_1|A_1) = \frac{P(A_1|D_1)P(D_1)}{P(A_1|D_1)P(D_1) + P(A_1|D_2)P(D_2) + P(A_1|D_3)P(D_3) + P(A_1|D_4)P(D_4)}$$
$$= \frac{(0.90)(0.028)}{(0.90)(0.028) + (0.06)(0.012) + (0.02)(0.032) + (0.02)(0.928)} = 0.5585$$

$$P(D_2|A_2) = \frac{(0.80)(0.012)}{(0.05)(0.028) + (0.80)(0.012) + (0.06)(0.032) + (0.01)(0.928)} = 0.4324$$

$$P(D_3|A_3) = \frac{(0.82)(0.032)}{(0.03)(0.028) + (0.05)(0.012) + (0.82)(0.032) + (0.02)(0.928)} = 0.5675$$