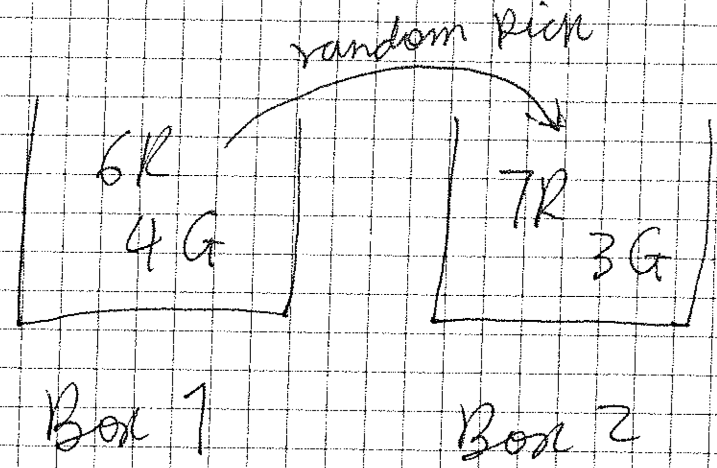
51
P. 81

a)



P(red from Box 1 AND red from Box 2)

$$= \frac{6}{10} * \frac{8}{11}$$

$$= \frac{48}{110}$$

$$= 0.436$$

b) To have same number as at beginning of process, then we must had Red - Red or Green - Green

$$P\left(\begin{array}{l}\text{same} \\ \text{\# as begin}\end{array}\right) = P(\text{Green-Green or Red-Red})$$

$$= \left(\frac{4}{10} * \frac{4}{11}\right) + \left(\frac{6}{10} * \frac{8}{11}\right)$$

$$= \frac{16}{110} + \frac{48}{110}$$

$$= \frac{64}{110}$$

$$= 0.581$$

62
p. 82

$$P(\overset{A}{\text{basic}}) = 0.4$$

$$\Rightarrow P(\overset{A^c}{\text{deluxe}}) = 0.6$$

$$P(\overset{B}{\text{warranty}} / \overset{A}{\text{basic}}) = 0.3$$

$$P(\overset{B}{\text{warranty}} / \overset{A^c}{\text{deluxe}}) = 0.5$$

$$P(\overset{A}{\text{basic}} / \overset{B}{\text{warranty}}) = ?$$

$$P(A/B) = \frac{P(A \cap B)}{P(B)} \quad \text{—— (1)}$$

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

$$\Rightarrow P(B \cap A) = P(A \cap B) = P(A) \cdot P(B/A) \quad \text{—— (2)}$$

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$(2) \rightarrow (1)$:

$$P\left(\cancel{A}/\cancel{B}\right) = \frac{P(A) \cdot P(B/A)}{P(B)} \quad \text{---} (3)$$

$$\cancel{= 0.4(}$$

Also

$$P(B) = P(A) \cdot P(B/A) + P(A^c) \cdot P(B/A^c) \quad \text{---} (4)$$

$(4) \rightarrow (3)$:

$$P(A/B) = \frac{P(A) \cdot P(B/A)}{P(A) \cdot P(B/A) + P(A^c) \cdot P(B/A^c)}$$

Bayes Theorem

$$= \frac{0.4(0.3)}{0.4(0.3) + 0.6(0.5)}$$

$$= 0.285$$