IMM - DTU

02405 Probability
2003-9-11
BFN/bfn

Solution for exercise 1.5.3 in Pitman

C The event that the chip is ok

A The event that a chip is accepted by the cheap test

Question a)

$$P(C|A) = \frac{P(A|C)P(C)}{P(A|C)P(C) + P(A|C^c)P(C)^c} = \frac{1 \cdot 0.8}{0.8 + 0.1 \cdot 0.2}$$

Question b) We introduce the event

S Chip sold

$$P(S) = 0.8 + 0.2 \cdot 0.1 = 0.82$$

The probability in question is

$$P(C^c|S) = \frac{P(S|C^c)P(C^c)}{P(S|C^c)P(C^c) + P(S|C)P(C)} = \frac{0.1 \cdot 0.2}{0.02 + 1 \cdot 0.8} = \frac{1}{41}$$