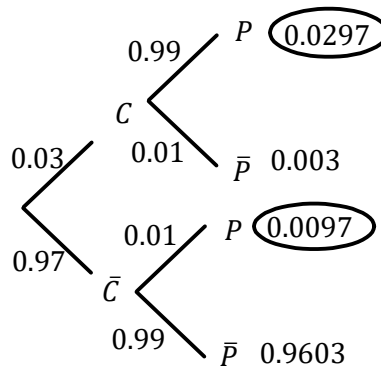


# P12 - 2.11 - Cancer/Defective Test

A Cancer test results is 99% accurate\*. 3% of population has cancer. Find the probability that a person tests positively to the disease but does not have cancer.

let  $C$  = Has Cancer  
let  $P$  = Tests Positive



$$P(\bar{C}|P) = \frac{P(\bar{C} \cap P)}{P(P)}$$

$$= \frac{0.0097}{0.0297 + 0.0097}$$

$$= 0.246$$

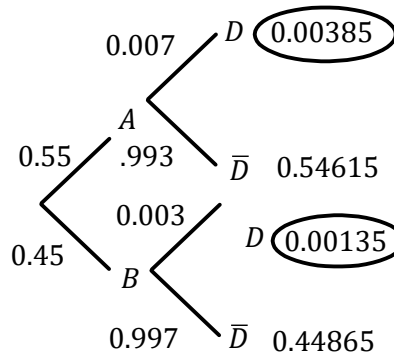
$$P(\bar{C}|P) = 25\%$$

$$P(P) = P(C \cap P) + P(\bar{C} \cap P)$$

$$= 0.0297 + 0.0097$$

Two factories A & B make light bulbs. 55% are made in factory A and 45% from B. Factory A's light bulbs are 0.7% defective 0.3% of B's. A defective light bulb is found, what is the probability it came from factory B?

Let  $A$  = Factory A  
Let  $B$  = Factory B  
Let  $D$  = Defective



$$P(B|D) = \frac{P(B \cap D)}{P(D)}$$

$$= \frac{0.00135}{0.00135 + 0.00385}$$

$$= 0.2596$$

$$P(B|D) = 26\%$$

$$P(D) = P(B \cap D) + P(A \cap D)$$

$$= 0.00135 + 0.00385$$