

① Prob. Urn I

احتمال (30)

$$P(A_1/B) = \frac{P(A_1) \cdot P(B|A_1)}{P(A_1) \cdot P(B|A_1) + P(A_2) \cdot P(B|A_2)}$$

$$P(A_1/B) = \frac{\frac{1}{2} \cdot \frac{1}{15}}{\frac{1}{2} \cdot \frac{1}{15} + \frac{1}{2} \cdot \frac{5}{14}}$$

$$= 0.15$$

② From Urn II

$$P(A_2/B) = \frac{P(B|A_2) \cdot P(A_2)}{P(B|A_1) \cdot P(A_1) + P(B|A_2) \cdot P(A_2)}$$

$$= \frac{\frac{5}{14} \cdot \frac{1}{2}}{\frac{1}{15} \cdot \frac{1}{2} + \frac{5}{14} \cdot \frac{1}{2}} = 0.85$$

EX(2) ^{جواب} ~~Three~~ Let A_1, A_2, A_3 are three machines where 20%, 30%, 50% of item we produced by A_1, A_2, A_3 respectively. Suppose that 1%, 2%, 3% of items are defective. if one item is selected at random from the entire batch and it is found to be defective. what is the prob. that this item was produced by Machine A_2 ?

سبباً واحدة من انتاج هذه الماكينة وظلت
ردية صار معنا شرط لازم ردية

ما هو احتمال هذه الوحدة المنتجة من الماكينة

هنا احتمالات كلية لان مقدرودة و ما يات شرط

احتمالات (3)

$$P(A_1) = \frac{20}{100} = \frac{2}{10} = 0.2$$

$$P(A_2) = \frac{30}{100} = \frac{3}{10} = 0.3$$

$$P(A_3) = \frac{50}{100} = \frac{5}{10} = 0.5$$

لنكن A_i الحدث الذي افترضنا اننا مكانه M_i

لكي 3

ولكن B الحدث الذي يكون رديع

نريد ان نحسب $P(A_2|B)$

$$P(B|A_1) = 0.01 = \frac{1}{100}$$

$$P(B|A_2) = \frac{2}{100} = 0.02$$

$$P(B|A_3) = 0.03$$

$$P(A_2|B) = \frac{P(A_2) \cdot P(B|A_2)}{\sum_{i=1}^3 P(A_i) \cdot P(B|A_i)}$$

$$= \frac{0.3 \cdot 0.02}{(0.2)(0.01) + (0.3)(0.02) + (0.5)(0.03)}$$

$$= 0.26$$

مثال (3) In a certain College 4% of the men and 1% of the women are taller than (180 cm). Furthermore, 60% of the students are women. Now, if a student is selected at random and is taller than 180 cm. what is the prob. that the student is a women? what is the prob. that the student is a man?

(H.W.)