AI1103 : Assignment 1

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Download all python codes from

https://github.com/Manojbhargav1305/AI1103/tree/main/Assignment1/codes

and latex codes from

https://github.com/Manojbhargav1305/AI1103/blob/main/Assignment1/Assignment1.tex

PROBLEM(2.8)

Two groups are competing for the position on the board of directors of a corporation.The probabilities that the first and the second groups will win are 0.6 and 0.4 respectively.Further,if the first group wins,the probability of introducing a new product is 0.7 and the corresponding probability is 0.3 if the second group wins.Find the probability that the new product introduced was by the second group.

SOLUTION

let $M \in \{0,1\}$ be a random variable such that $M = 0$ represents product is not introduced by winning group and $M = 1$ represents product is introduced by the winning group.let $H \in \{0,1\}$ be another random variable such that $H = 0$ represents that group A wins,$H = 1$ represents that group B wins. we know that Bayes theorem: $P(A|B) = \frac{P(A \cap B)}{P(B)}, if$ P(B)$\neq$ 0. so required probability that new product was introduced by group B be P.

TABLE 0

	$H = 0$	$H = 1$
$M = 0$	o.18	0.28
$M = 1$	0.42	0.12

$$P = Pr(M = 0|H = 0) + Pr(M = 1|H = 1) \quad (0.0.1)$$
$$= 0.18 + 0.12 \quad (0.0.2)$$
$$= 0.30 \quad (0.0.3)$$
$$(0.0.4)$$

hence the required probability that the product was introduced by the second group is 0.30