

AI1103 : Assignment 1

Javaji Manoj Bhargav - CS20BTECH11022

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>

$$P = (A|B) = \frac{P(A \cap B)}{P(B)}, \text{ if } P(B) \neq 0 \quad (0.0.1)$$

so required probability that new product was introduced by group B be P.

$$P = Pr(M = 0|H = 0) + Pr(M = 1|H = 1) \quad (0.0.2)$$

$$= 0.18 + 0.12 \quad (0.0.3)$$

$$= 0.30 \quad (0.0.4)$$

$$(0.0.5)$$

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.

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

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:

TABLE 0

variable	description
$M = 0$	not introduced by winning group
$M = 1$	introduced by winning group
$H = 0$	group A wins
$H = 1$	group B wins

TABLE 0: 1

	$H = 0$	$H = 1$
$M = 0$	0.28	0.18
$M = 1$	0.42	0.12