

ASSIGNMENT 7

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Download all python codes from

https://github.com/manik2255/AI1103-PROBABILITY-AND-RANDOM-VARIABLES/blob/main/ASSIGNMENT_7/assign_7.py

and latex-tikz codes from

https://github.com/manik2255/AI1103-PROBABILITY-AND-RANDOM-VARIABLES/blob/main/ASSIGNMENT_7/ASSIGNMENT_7.tex

using (2.0.2) and (2.0.4) in (2.0.6),

$$\frac{1}{2} = \Pr(A) + \frac{1}{4} - \frac{\Pr(A)}{4} \quad (2.0.7)$$

$$\frac{1}{4} = \frac{3 \Pr(A)}{4} \quad (2.0.8)$$

$$\therefore \Pr(A) = \frac{1}{3} \quad (2.0.9)$$

1 GATE 2021 ST PROBLEM.14

Let A and b be two events such that $\Pr(B) = \frac{3}{4}$ and $\Pr(A + B') = \frac{1}{2}$. If A and B are independent, then $\Pr(A)$ equals

2 SOLUTION

Given,

$$\Pr(B) = \frac{3}{4} \quad (2.0.1)$$

$$\Pr(A + B') = \frac{1}{2} \quad (2.0.2)$$

we know that,

$$\Pr(B') = 1 - \Pr(B) \quad (2.0.3)$$

using (2.0.1) in (2.0.3),

$$\Pr(B') = \frac{1}{4} \quad (2.0.4)$$

we know that,

$$\Pr(A + B') = \Pr(A) + \Pr(B') - \Pr(A, B') \quad (2.0.5)$$

A and B are independent \iff A and B' are independent

$$\Pr(A + B') = \Pr(A) + \Pr(B') - \Pr(A) \Pr(B') \quad (2.0.6)$$