Assignment 1

AI1110: Probability and Random Variables
Indian Institute of Technology Hyderabad

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PROBLEM 12.13.2.8

8. Let and B be independent events with P(A) = 0.3 and P(B) = 0.4. Find

(i) P(AB) (ii) P(A+B)

(iii) P(A|B) (iv) P(B|A)

SOLUTION:

Given, P(A) = 0.3 , P(B) = 0.4 and A, B are independent events.

0.1 P(AB)

P(AB) = P(A)*P(B)
P(AB) = 0.3*0.4 = 0.12

0.2 P(A+B)

We know that, P(A+B) = P(A) + P(B) - P(AB)
P(A+B) = 0.3 + 0.4 - 0.12 = 0.58

0.3 P(A|B)

$P(A|B) = \frac{P(AB)}{P(B)}$

$P(A|B) = \frac{P(A)*P(B)}{(P(B)} = P(A) = 0.3$

0.4 P(B|A)

$P(B|A) = \frac{P(BA)}{P(A)} = \frac{P(B)*P(A)}{P(A)} = P(B) = 0.4$