Assignment 1

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Download latex-tikz codes from

https://github.com/KBVijayVarma/AI1103-Assignment-1

1 Problem

(Prob.isc.6.12) Let A and B be independent events with P(A) = 0.3 and P(B) = 0.4. Find

1) P(A ∩ B)
2) P(A ∪ B)
3) P(A/B)
4) P(B/A)

2 Solution

Given A and B are Independent events and

$$\Pr(A) = 0.3 \tag{2.0.1}$$
$$\Pr(B) = 0.4 \tag{2.0.2}$$

1) By definition,

$$\Pr(AB) = \Pr(A)\Pr(B) \tag{2.0.3}$$
$$\Pr(AB) = (0.3)(0.4) \tag{2.0.4}$$
$$\therefore \Pr(AB) = 0.12 \tag{2.0.5}$$

2) By definition,

$$\Pr(A+B) = \Pr(A) + \Pr(B) - \Pr(AB) \tag{2.0.6}$$

From (2.0.5),

$$\Pr(A+B) = 0.3 + 0.4 - (0.12) \tag{2.0.7}$$
$$\therefore \Pr(A+B) = 0.58 \tag{2.0.8}$$

3) From the definition of Independent Events,

$$\Pr(A/B) = \Pr(A) \tag{2.0.9}$$
$$\therefore \Pr(A/B) = 0.3 \tag{2.0.10}$$

4) From the definition of Independent Events,

$$\Pr(B/A) = \Pr(B) \tag{2.0.11}$$
$$\therefore \Pr(B/A) = 0.4 \tag{2.0.12}$$