Probability Assignment

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12.13.1.3

If $\Pr(A) = 0.8$, $\Pr(B) = 0.5$, and $\Pr(AB) = 0.32$, find:

(i) $\Pr(AB)$

(ii) $\Pr(A|B)$

(iii) $\Pr(A + B)$

Solution:

(i) Given, $\Pr(A) = 0.8$

We know that,

$$\Pr(B|A) = \frac{\Pr(AB)}{\Pr(A)} \tag{1}$$

$$0.4 = \frac{\Pr(AB)}{0.8} \tag{2}$$

$$\Pr(AB) = 0.32 \tag{3}$$

(ii) Similarly,

$$\Pr(A|B) = \frac{\Pr(AB)}{\Pr(B)} \tag{4}$$

$$\Pr(A|B) = \frac{\Pr(AB)}{\Pr(B)} \tag{5}$$

$$\Pr(A|B) = \frac{0.32}{0.5} \tag{6}$$

$$= 0.64 \tag{7}$$

(iii)

$$\Pr(A + B) = \Pr(A) + \Pr(B) - \Pr(A - B) \tag{8}$$

$$\Pr(A + B) = 0.8 + 0.5 - 0.32 \tag{9}$$

$$= 0.98 \tag{10}$$