

Assignment 1

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1) A and B are two events such that $\Pr(A) \neq 0$.

Find $\Pr(B | A)$, if

a) A is a subset of B

b) $A \cap B = \phi$

Solution: By using the property of conditional probability we have,

$$\Pr(B | A) = \frac{\Pr(BA)}{\Pr(A)} \quad (0.0.1)$$

a) A is a subset of B i.e., $A \subset B$. This implies

$$BA = A \quad (0.0.2)$$

$$\Pr(BA) = \Pr(A) \quad (0.0.3)$$

From equation (0.0.1), we get

$$\Pr(B | A) = 1 \quad (0.0.4)$$

b) $A \cap B = \phi$. This implies

$$\Pr(BA) = 0 \quad (0.0.5)$$

From equation (0.0.1), we get

$$\Pr(B | A) = 0 \quad (0.0.6)$$