Assignment1

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Q 1.17 Determine P(E/F), if two coins are tossed once, where
(i) E : tail appears on one coin, F : one coin shows head
(ii) E : no tail appears, F : no head appears

solution
(i) Let X denotes the number of heads shown up during the simultaneous toss of two coins,so
where $x_1 = 1, x_2 = 2$ n : number of coins = 2 and p: the probability of getting a head is $\frac{1}{2}$

$$P(F) = P(X \geq 1) = P(X = x_1) + P(X = x_2)$$

By binomial distribution

$$P(X = x_1) = \binom{n}{x_1} p^2$$

$$P(X = x_2) = \binom{n}{x_2} p^2$$

$$\text{hence} P(F) = \binom{n}{x_1} p^2 + \binom{n}{x_2} p^2$$

$$P(F) = \frac{1}{2} + \frac{1}{4} = \frac{3}{4}$$

$$P(EF) = P(X = x_1) = \binom{n}{x_1} p^2$$

$$P(EF) = \frac{1}{2}$$

$$P(E/F) = \frac{2}{3}$$

(ii) $P(F) = P(X = k) = \binom{n}{k} p^2, k = 2$

$$= \frac{1}{4}$$

$$P(EF) = 0$$

$$P(E/F) = 0$$