Assignment 1

AI1110:Probabolity and Random Variables

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12.13.2.6:Let E and F be events with $P(E)=\frac{3}{5}$,$P(F)=\frac{3}{10}$and $P(EandF)=\frac{1}{5}$. Are E and F independent?

Solution:Given,

$$P(E)=\frac{3}{5}$$
$$P(F)=\frac{3}{10}$$
$$P(EandF)=\frac{1}{5}$$

2Events are said to be independent iff the product of probabilities of occurence of the events is equals to the probability of occurence of both events. i.e, E and F are independent iff,

$$P(E).P(F) = P(EandF)$$

consider the product of P(E) and P(F)

$$P(E).P(F) = \frac{3}{5} \cdot \frac{3}{10}$$
$$P(E).P(F) = \frac{9}{50}$$

W.K.T,

$$\text{P(E and F)}=\frac{1}{5}$$

Since,

$$P(E).P(F) \neq P(EandF)$$

E and F are not independent events.