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AI1110 Assignment 1 in LATEX

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12.13.2.6:Let E and F be events with $Pr(E) = \frac{3}{5}$, $Pr(F) = \frac{3}{10}$ and $Pr(EF) = \frac{1}{5}$. Are E and F independent? **Solution**: Given,

$$\Pr\left(E\right) = \frac{3}{5} \tag{1}$$

$$\Pr\left(F\right) = \frac{3}{10}\tag{2}$$

$$\Pr\left(EF\right) = \frac{1}{5}\tag{3}$$

2 events 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,

$$Pr(E) \times Pr(F) = Pr(EF) \tag{4}$$

$$Pr(E) \times Pr(F) = \frac{3}{5} \times \frac{3}{10}$$
 (5)

$$Pr(E) \times Pr(F) = \frac{9}{50} \tag{6}$$

$$: \Pr(EF) = \frac{1}{5} \tag{7}$$

$$Pr(E) \times Pr(F) \neq Pr(EF)$$
 (8)

E and F are not independent events.

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