

# AI1110 Assignment 1 in L<sup>A</sup>T<sub>E</sub>X

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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,

$$\Pr(E) = \frac{3}{5} \quad (1)$$

$$\Pr(F) = \frac{3}{10} \quad (2)$$

$$\Pr(EF) = \frac{1}{5} \quad (3)$$

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

$$\Pr(E) \times \Pr(F) = \Pr(EF) \quad (4)$$

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

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

$$\therefore \Pr(EF) = \frac{1}{5} \quad (7)$$

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

E and F are not independent events.