ASSIGNMENT 1

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Q.11.13.3.15
If E and F are events such that $\Pr(E) = \frac{1}{4}$, $\Pr(F) = \frac{1}{2}$ and $\Pr(EF) = \frac{1}{8}$, find
(i) $\Pr(E + F)$
(ii) $\Pr(E'F')$

solution:
(i) $\Pr(E + F)$
For given two events E and F, we know that,

$$\Pr(E + F) = \Pr(E) + \Pr(F) - \Pr(EF) \tag{1}$$
$$\Rightarrow \Pr(E + F) = \frac{1}{4} + \frac{1}{2} - \frac{1}{8} \tag{2}$$
$$= \frac{5}{8} \tag{3}$$
$$\therefore \Pr(E + F) = \frac{5}{8} \tag{4}$$

(ii) $\Pr(E'F')$
For given two events E and F, we know that,

$$\Pr(E'F') = (\Pr(E + F))' \tag{5}$$
$$\Rightarrow \Pr(E'F') = 1 - \Pr(E + F) \tag{6}$$
$$\Rightarrow \Pr(E'F') = 1 - \frac{5}{8} \tag{7}$$
$$= \frac{3}{8} \tag{8}$$
$$\therefore \Pr(E'F') = \frac{3}{8} \tag{9}$$