

# Assignment 6

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**Abstract**—This document contains the solution for Assignment 6 (NCERT Class 12 13.1 1)

**13.1 1 [NCERT 12] :** Given that E and F are events such that  $\Pr(E) = 0.6$ ,  $\Pr(F) = 0.3$  and  $\Pr(E \cap F) = 0.2$ , find  $\Pr(E|F)$  and  $\Pr(F|E)$

**Solution:**

Denote the random variable  $X \in \{0, 1\}$ , where  $X = 0$  denotes the event E and  $X = 1$  denotes the event F.

Then,

$\Pr(X = 0|X = 1)$  denotes  $\Pr(E|F)$

$\Pr(X = 1|X = 0)$  denotes  $\Pr(F|E)$

$$\Pr(X = 0|X = 1) = \frac{\Pr(X = 0 \cap X = 1)}{\Pr(X = 1)} \quad (1)$$

$$\implies \boxed{\Pr(X = 0|X = 1) = \frac{2}{3}} \quad (2)$$

$$\Pr(X = 1|X = 0) = \frac{\Pr(X = 0 \cap X = 1)}{\Pr(X = 0)} \quad (3)$$

$$\implies \boxed{\Pr(X = 1|X = 0) = \frac{1}{3}} \quad (4)$$