

# Assignment 1

## AI1110: Probability and Random Variables

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**12.13.1.1:** Given that  $E$  and  $F$  are events such that  $\Pr(E) = 0.6$ ,  $\Pr(F) = 0.3$  and  $\Pr(EF) = 0.2$ , find  $\Pr(E|F)$  and  $\Pr(F|E)$

**Solution:** Given,

$$\Pr(E) = 0.6 \quad (1)$$

$$\Pr(F) = 0.3 \quad (2)$$

$$\Pr(EF) = 0.2 \quad (3)$$

(a)

$$\Pr(E|F) = \frac{\Pr(EF)}{\Pr(F)} \quad (4)$$

$$= \frac{0.2}{0.3} \quad (5)$$

$$= \frac{2}{3} \quad (6)$$

(b)

$$\Pr(F|E) = \frac{\Pr(FE)}{\Pr(E)} \quad (7)$$

$$= \frac{0.2}{0.6} \quad (8)$$

$$= \frac{1}{3} \quad (9)$$