AI1110: Assignment-1

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12.13.1.8 Question: Compute $\Pr(E|F)$ where E and F are: A die is thrown three times, E : 4 appears on the third toss, F : 6 and 5 appears respectively on first two tosses.

Answer: $(\frac{1}{6})$

Solution:
F is the event that 6 and 5 occur respectively in first two tosses.

$$\Pr(F) = \frac{1}{6} \times \frac{1}{6} \tag{1}$$

$$\Pr(F) = \frac{1}{36} \tag{2}$$

The event EF consists of the only outcome 6,5,4 occuring in first three tosses.

$$\Pr(EF) = \frac{1}{6} \times \frac{1}{6} \times \frac{1}{6} \tag{3}$$

$$\Pr(EF) = \frac{1}{216} \tag{4}$$

We have,

E	$\Pr(E)=\frac{1}{36}$	6 and 5 occuring respectively on first 2 rolls
EF	$\Pr(EF)=\frac{1}{216}$	6,5 and 4 occuring respectively on first 3 rolls

(5)

TABLE I
FINAL PROBABILITIES OF THE EVENTS.

$$\Pr(E|F) = \frac{\Pr(EF)}{\Pr(F)} \tag{6}$$

$$\Pr(E|F) = \frac{\frac{1}{216}}{\frac{1}{36}} \tag{7}$$

$$\Pr(E|F) = \frac{1}{6} \tag{8}$$