

# Assignment 1

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- 1) Probability that A speaks truth is  $\frac{4}{5}$ . A coin is tossed. A reports that a head appears. The probability that actually there was head is

- a)  $\frac{4}{5}$
- b)  $\frac{1}{2}$
- c)  $\frac{1}{5}$
- d)  $\frac{2}{5}$

**Solution:** Let  $E$  denote the event that person A speaks truth, then we have

$$\Pr(E) = \frac{4}{5} \quad (0.0.1)$$

Let  $X$  denote the event of occurring a head when a coin is tossed

$$\Pr(X) = \frac{1}{2} \quad (0.0.2)$$

Note that the events  $X, E$  are independent. The probability that actually there was head, when A reports that a head appears is,

$$\Pr(E | X) = \Pr(E) \quad (0.0.3)$$

$$= \frac{4}{5} \quad (0.0.4)$$