

② Bag 1 \rightarrow White balls = 4
Black balls = 6

Bag 2 \rightarrow White balls = 4
Black balls = 3

$$p(E_1) = p(E_2) = \frac{1}{2} \text{ \# Choosing one bag.}$$

Probability of black balls in bag 1

$$\rightarrow p(A/E_1) = \frac{6}{10}$$

Probability of black balls in bag 2.

$$\rightarrow p(A/E_2) = \frac{3}{7}$$

$$\begin{aligned} p(E_1/A) &= \frac{p(E_1) * p(A/E_1)}{p(E_1) * p(A/E_1) + p(E_2) * p(A/E_2)} \\ &= \frac{\frac{1}{2} * \frac{6}{10}}{\left(\frac{1}{2} * \frac{6}{10} + \frac{1}{2} * \frac{3}{7}\right)} \\ &= 0.5833 \end{aligned}$$

③ Probability of it's a truth = $\frac{2}{3} = P(A)$

11 11 11 11 $\text{lie} = \frac{1-2}{3} = \frac{1}{3} = p(B)$

Probability of getting a "4" = $\frac{1}{6} = p(E_1)$

" " not " " " " = $1 - \frac{1}{6} = \frac{5}{6} = P(E_2)$

$$P(A/E_1) = \frac{2/3}{1/6} P(A) = \frac{2/3}{1/6}$$

$$P(B/E_2) = \frac{P(B)}{P(E_2)} = \frac{1/3}{5/6}$$

$$P(E_1/A) = \frac{P(A) * P(A/E_1)}{P(A) * P(A/E_1) + P(B) * P(A/E_2)}$$

$$= \frac{2/3 * \frac{1}{6}}{(2/3 * \frac{1}{6} + \frac{1}{3} * \frac{5}{6})}$$

 0.66