

# Assignment 2

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Download all python codes from

[https://github.com/sujal100/  
Probability\\_and\\_Random\\_variable/tree/main/  
exercise\\_2/codes](https://github.com/sujal100/Probability_and_Random_variable/tree/main/exercise_2/codes)

and latex codes from

[https://github.com/sujal100/  
Probability\\_and\\_Random\\_variable/blob/main/  
/exercise\\_2/exercise\\_2\\_main\\_tex.tex](https://github.com/sujal100/Probability_and_Random_variable/blob/main/exercise_2/exercise_2_main_tex.tex)

## 1 PROBLEM

A box contains 4 white balls and 3 red balls. In succession, two balls are randomly selected and removed from the box. Given that the first removed ball is white, the probability that the second removed ball is red is

(A)  $\frac{1}{3}$  (B)  $\frac{3}{7}$  (C)  $\frac{1}{2}$  (D)  $\frac{4}{7}$

## 2 SOLUTION

No of white balls = 4, no of red balls = 3.

If first removed ball is white then remaining number of balls = 6(3 white, 3 red ).

Consider,

$W_1$  = First remove ball is White.

$R_2$  = Second removed ball is Red.

Since,  $W_1$  &  $R_2$  are independent events.

So,

$$Pr(W_1 R_2) = Pr(W_1) \cdot Pr(R_2) \quad (2.0.1)$$

And, required probability is

$$Pr(R_2/W_1) = \frac{Pr(W_1 R_2)}{Pr(W_1)} = \frac{Pr(W_1) \cdot Pr(R_2)}{Pr(W_1)} = Pr(R_2) \quad (2.0.2)$$

We have 6 balls, one ball can be choose in  ${}^6C_1$  ways, Since there are three red balls so probability that the second ball is red is  $Pr(R_2)$

$$= {}^6C_1 / {}^3C_1$$

$$= 3/6$$

$$= 1/2$$

Hence (C) is correct option.