

Probability Assignment 1

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1 PROBLEM STATEMENT

Two balls are drawn at random with replacement from box containing 10 black and 8 red balls. Find the probability that :

- 1) both balls are red
- 2) first ball is black and second ball is red
- 3) one of them is black the other one is red

2 EXPLANATION

Given A box containing 10 black and 8 red balls.
Total number of balls in box = 18

2.1 Both balls are red :

Probability of getting a red ball in first draw = $\frac{8}{18}$
 $= \frac{4}{9}$ As the ball is replaced after first throw, Hence,
 Probability of getting a red ball in second draw = $\frac{8}{18} = \frac{4}{9}$ Now, Probability of getting both balls red = $\frac{4}{9} \times \frac{4}{9} = \frac{16}{81}$

2.2 First ball is black and second is red :

Probability of getting a black ball in first draw = $\frac{10}{18} = \frac{5}{9}$ As the ball is replaced after first throw, Hence, Probability of getting a red ball in second draw = $\frac{8}{18} = \frac{4}{9}$ Now, Probability of getting first ball is black and second is red = $\frac{5}{9} \times \frac{4}{9} = \frac{20}{81}$

2.3 One of them is black and other is red :

Probability of getting a black ball in first draw = $\frac{10}{18} = \frac{5}{9}$ As the ball is replaced after first throw, Hence, Probability of getting a red ball in second draw = $\frac{8}{18} = \frac{4}{9}$ Now, Probability of getting first ball is black and second is red = $\frac{5}{9} \times \frac{4}{9} = \frac{20}{81}$ Probability of getting a red ball in first draw = $\frac{8}{18} = \frac{4}{9}$ As the ball is replaced after first throw, Hence, Probability of getting a black ball in second draw = $\frac{10}{18} = \frac{5}{9}$ Now, Probability of getting first ball is red and second is black = $\frac{4}{9} \times \frac{5}{9} = \frac{20}{81}$ Therefore, Probability of getting one of them black and other one red is = Probability of getting first ball black and second one red + Probability of getting first ball red and second one black = $\frac{5}{9} \times \frac{4}{9} = \frac{20}{81}$

3 CODE

The python code is as follows :

```
ball = int(input("Enter the number of balls"))
red = int(input("Enter the number of red balls:"))
black = int(input("Enter the number of black balls
:"))

while ball != (red+black) :
    red = int(input("Enter the number of red balls
:"))
    black = int(input("Enter the number of black
balls:"))

answer1,answer2,answer3,count = 0,0,0,0
for k in range(1,ball+1,1):
    for j in range(1,ball+1,1):
        if k<=red and j<=red :
            answer1+=1
        if k>red and j<=red :
            answer2+=1
        if k<=red and j>red :
            answer3+=1

for k in range(1,ball+1,1):
    for j in range(1,ball+1,1):
        count+=1

print(f"2.1 answer={answer1/count}, 2.2 answer
={answer2/count}, 2.3 answer={({answer2+
answer3)/count}")
```