Drawing Balls from a Bag
Data Science and A.I. Lecture Series

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Problem Statement

Problem Statement: A bag contains:

- 4 red balls
- 5 black balls
- 2 green balls

One ball is drawn at random. Find the probability that:

1. It is a red ball.
2. It is not black.
3. It is green or black.

Step 1: Total Balls in the Bag

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Calculate the total number of balls in the bag.

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Calculate the total number of balls in the bag.

$$\text{Total balls} = \text{Red balls} + \text{Black balls} + \text{Green balls}$$

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$$\text{Total balls} = 4 + 5 + 2 = 11$$

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$$\text{Total balls} = 4 + 5 + 2 = 11$$

Thus, the total number of balls in the bag is **11**.

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One ball is drawn at random. Find the probability that:

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The probability of drawing a red ball is calculated as:

Step 2: Probability of Drawing a Red Ball

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One ball is drawn at random. Find the probability that:

1. It is a red ball.
2. It is not black.
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The probability of drawing a red ball is calculated as:

$$P(\text{Red}) = \frac{\text{Number of red balls}}{\text{Total balls}}$$

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Substitute the values:

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$$P(\text{Red}) = \frac{\text{Number of red balls}}{\text{Total balls}}$$

Substitute the values:

$$P(\text{Red}) = \frac{4}{11}$$

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One ball is drawn at random. Find the probability that:

1. It is a red ball.
2. It is not black.
3. It is green or black.

The probability of drawing a red ball is calculated as:

$$P(\text{Red}) = \frac{\text{Number of red balls}}{\text{Total balls}}$$

Substitute the values:

$$P(\text{Red}) = \frac{4}{11}$$

Thus, the probability of drawing a red ball is $\frac{4}{11}$.

Step 3: Probability of Not Drawing a Black Ball

Problem Statement: A bag contains:

- 4 red balls
- 5 black balls
- 2 green balls

One ball is drawn at random. Find the probability that:

1. It is a red ball.
2. It is not black.
3. It is green or black.

To find the probability of not drawing a black ball, consider the number of balls that are not black:

Step 3: Probability of Not Drawing a Black Ball

Problem Statement: A bag contains:

- 4 red balls
- 5 black balls
- 2 green balls

One ball is drawn at random. Find the probability that:

1. It is a red ball.
2. It is not black.
3. It is green or black.

To find the probability of not drawing a black ball, consider the number of balls that are not black:

$$\text{Not black balls} = \text{Red balls} + \text{Green balls}$$

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One ball is drawn at random. Find the probability that:

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3. It is green or black.

To find the probability of not drawing a black ball, consider the number of balls that are not black:

$$\text{Not black balls} = \text{Red balls} + \text{Green balls}$$

$$\text{Not black balls} = 4 + 2 = 6$$

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The probability is:

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To find the probability of not drawing a black ball, consider the number of balls that are not black:

$$\text{Not black balls} = \text{Red balls} + \text{Green balls}$$

$$\text{Not black balls} = 4 + 2 = 6$$

The probability is:

$$P(\text{Not Black}) = \frac{\text{Number of not black balls}}{\text{Total balls}}$$

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One ball is drawn at random. Find the probability that:

1. It is a red ball.
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To find the probability of not drawing a black ball, consider the number of balls that are not black:

$$\text{Not black balls} = \text{Red balls} + \text{Green balls}$$

$$\text{Not black balls} = 4 + 2 = 6$$

The probability is:

$$P(\text{Not Black}) = \frac{\text{Number of not black balls}}{\text{Total balls}}$$

$$P(\text{Not Black}) = \frac{6}{11}$$

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One ball is drawn at random. Find the probability that:

1. It is a red ball.
2. It is not black.
3. It is green or black.

To find the probability of not drawing a black ball, consider the number of balls that are not black:

$$\text{Not black balls} = \text{Red balls} + \text{Green balls}$$

$$\text{Not black balls} = 4 + 2 = 6$$

The probability is:

$$P(\text{Not Black}) = \frac{\text{Number of not black balls}}{\text{Total balls}}$$

$$P(\text{Not Black}) = \frac{6}{11}$$

Thus, the probability of not drawing a black ball is $\frac{6}{11}$.

Step 4: Probability of Drawing a Green or Black Ball

Problem Statement: A bag contains:

- 4 red balls
- 5 black balls
- 2 green balls

One ball is drawn at random. Find the probability that:

1. It is a red ball.
2. It is not black.
3. It is green or black.

The probability of drawing a green or black ball is calculated by adding the probabilities of drawing a green ball and a black ball:

Problem Statement: A bag contains:
- 4 red balls
- 5 black balls
- 2 green balls

One ball is drawn at random. Find the probability that:

1. It is a red ball.
2. It is not black.
3. It is green or black.

The probability of drawing a green or black ball is calculated by adding the probabilities of drawing a green ball and a black ball:

$$P(\text{Green or Black}) = P(\text{Green}) + P(\text{Black})$$

Step 4: Probability of Drawing a Green or Black Ball

Problem Statement: A bag contains:
- 4 red balls
- 5 black balls
- 2 green balls

One ball is drawn at random. Find the probability that:

1. It is a red ball.
2. It is not black.
3. It is green or black.

The probability of drawing a green or black ball is calculated by adding the probabilities of drawing a green ball and a black ball:

$$P(\text{Green or Black}) = P(\text{Green}) + P(\text{Black})$$

First, calculate the probabilities:

Step 4: Probability of Drawing a Green or Black Ball

Problem Statement: A bag contains:

- 4 red balls
- 5 black balls
- 2 green balls

One ball is drawn at random. Find the probability that:

1. It is a red ball.
2. It is not black.
3. It is green or black.

The probability of drawing a green or black ball is calculated by adding the probabilities of drawing a green ball and a black ball:

$$P(\text{Green or Black}) = P(\text{Green}) + P(\text{Black})$$

First, calculate the probabilities:

$$P(\text{Green}) = \frac{\text{Number of green balls}}{\text{Total balls}} = \frac{2}{11}$$

Step 4: Probability of Drawing a Green or Black Ball

Problem Statement: A bag contains:

- 4 red balls
- 5 black balls
- 2 green balls

One ball is drawn at random. Find the probability that:

1. It is a red ball.
2. It is not black.
3. It is green or black.

The probability of drawing a green or black ball is calculated by adding the probabilities of drawing a green ball and a black ball:

$$P(\text{Green or Black}) = P(\text{Green}) + P(\text{Black})$$

First, calculate the probabilities:

$$P(\text{Green}) = \frac{\text{Number of green balls}}{\text{Total balls}} = \frac{2}{11}$$

$$P(\text{Black}) = \frac{\text{Number of black balls}}{\text{Total balls}} = \frac{5}{11}$$

Step 4: Probability of Drawing a Green or Black Ball

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- 5 black balls
- 2 green balls

One ball is drawn at random. Find the probability that:
1. It is a red ball.
2. It is not black.
3. It is green or black.

The probability of drawing a green or black ball is calculated by adding the probabilities of drawing a green ball and a black ball:

$$P(\text{Green or Black}) = P(\text{Green}) + P(\text{Black})$$

First, calculate the probabilities:

$$P(\text{Green}) = \frac{\text{Number of green balls}}{\text{Total balls}} = \frac{2}{11}$$

$$P(\text{Black}) = \frac{\text{Number of black balls}}{\text{Total balls}} = \frac{5}{11}$$

Add the probabilities:

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One ball is drawn at random. Find the probability that:

1. It is a red ball.
2. It is not black.
3. It is green or black.

The probability of drawing a green or black ball is calculated by adding the probabilities of drawing a green ball and a black ball:

$$P(\text{Green or Black}) = P(\text{Green}) + P(\text{Black})$$

First, calculate the probabilities:

$$P(\text{Green}) = \frac{\text{Number of green balls}}{\text{Total balls}} = \frac{2}{11}$$

$$P(\text{Black}) = \frac{\text{Number of black balls}}{\text{Total balls}} = \frac{5}{11}$$

Add the probabilities:

$$P(\text{Green or Black}) = \frac{2}{11} + \frac{5}{11} = \frac{7}{11}$$

Step 4: Probability of Drawing a Green or Black Ball

Problem Statement: A bag contains:
- 4 red balls
- 5 black balls
- 2 green balls

One ball is drawn at random. Find the probability that:

1. It is a red ball.
2. It is not black.
3. It is green or black.

The probability of drawing a green or black ball is calculated by adding the probabilities of drawing a green ball and a black ball:

$$P(\text{Green or Black}) = P(\text{Green}) + P(\text{Black})$$

First, calculate the probabilities:

$$P(\text{Green}) = \frac{\text{Number of green balls}}{\text{Total balls}} = \frac{2}{11}$$

$$P(\text{Black}) = \frac{\text{Number of black balls}}{\text{Total balls}} = \frac{5}{11}$$

Add the probabilities:

$$P(\text{Green or Black}) = \frac{2}{11} + \frac{5}{11} = \frac{7}{11}$$

Thus, the probability of drawing a green or black ball is $\frac{7}{11}$.

Final Results

Problem Statement: A bag contains:

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- 2 green balls

One ball is drawn at random. Find the probability that:

1. It is a red ball.
2. It is not black.
3. It is green or black.

Here are the probabilities for each scenario:

- Probability of drawing a red ball: $\frac{4}{11}$

Final Results

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One ball is drawn at random. Find the probability that:

1. It is a red ball.
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3. It is green or black.

Here are the probabilities for each scenario:

- Probability of drawing a red ball: $\frac{4}{11}$
- Probability of not drawing a black ball: $\frac{6}{11}$

Final Results

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Here are the probabilities for each scenario:

- Probability of drawing a red ball: $\frac{4}{11}$
- Probability of not drawing a black ball: $\frac{6}{11}$
- Probability of drawing a green or black ball: $\frac{7}{11}$

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