Assignment 1

AI1110: Probability and Random Variables
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10.15.2.4: Question.A box contains 12 balls out of which x are black. If one ball is drawn at random from the box, what is the probability that it will be a black ball?

If 6 more black balls are put in the box, the probability of drawing a black ball is now double of what it was before. Find x.

Solution:

Let x be the number of black balls initially.Total number of balls is 12

The probability of drawing a black ball initially is given by:

$$\text{Probability} = \frac{x}{12}$$

After adding 6 more black balls to the box, the total number of black balls becomes $x + 6$.

The probability of drawing a black ball after adding 6 more black balls is given by:

$$\text{Probability} = \frac{x+6}{18}$$

According to the problem, this probability is double the initial probability. Therefore:

$$\frac{x+6}{18} = 2 \times \frac{x}{12}$$

Simplifying this equation will give us the value of x as 3.