Assignment 1

AI1110: Probability and Random Variables
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10.15.2.5: Question. A jar contains 24 marbles, some are green and others are blue. If a marble is drawn at random from the jar, the probability that it is green is $\frac{2}{3}$. Find the number of blue balls in the jar.

Answer: 8.

Solution: Given that the total number of marbles in the jar is 24. Let, the number of Blue marbles in the bag be **x** and the number of Green marbles in the bag be **y**. So, we have

$$x + y = 24 \tag{1}$$

Let, G be an event that a randomly drawn marble is of colour Green.

$$\Pr(G) = \frac{y}{24} \tag{2}$$

We know that the probability of drawing a Green marble is $\frac{2}{3}$.

$$\Pr(G) = \frac{2}{3} \tag{3}$$

From equations (2) and (3), we get:

$$\frac{y}{24} = \frac{2}{3} \tag{4}$$

$$\implies y = 16 \tag{5}$$

Now we can substitute this value of y in equation (1) to get:

$$x + 16 = 24$$
$$\implies x = 8$$

Therefore, There are 8 Blue marbles in the jar.