Assignment 7
AI1110: Probability and Random Variables

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Q15 [12th CBSE Probability Exercise 13.5]: The probability that a student is not a swimmer is $\frac{1}{5}$. Then the probability that out of five students, four are swimmers is?

Solution: Let X be the number of swimmers and given that the probability of a student being swimmer is $\frac{1}{5}$

Then X has the binomial distribution

$$\Pr(X = k) = {}^{n}C_{k}p^{k}(1-p)^{n-k} \qquad (1)$$

Here,

$$p = \frac{1}{5} \qquad (2)$$
$$n = 5 \qquad (3)$$
$$k = 4 \qquad (4)$$

$\therefore$ The required probability is ${}^{5}C_{4}\left(\frac{4}{5}\right)^{4}\left(\frac{1}{5}\right)$