

A Simple Problem On Binomial Distribution

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Question

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 students and given that the probability of a student being swimmer is $\frac{1}{5}$

Then X has the binomial distribution

$$\Pr(X = k) = {}^nC_k p^k (1 - p)^{n-k} \quad (1)$$

Here,

$$p = \frac{1}{5} \quad (2)$$

$$n = 5 \quad (3)$$

$$k = 4 \quad (4)$$

\therefore The required probability is ${}^5C_4 \left(\frac{4}{5}\right)^4 \left(\frac{1}{5}\right)$

Solution

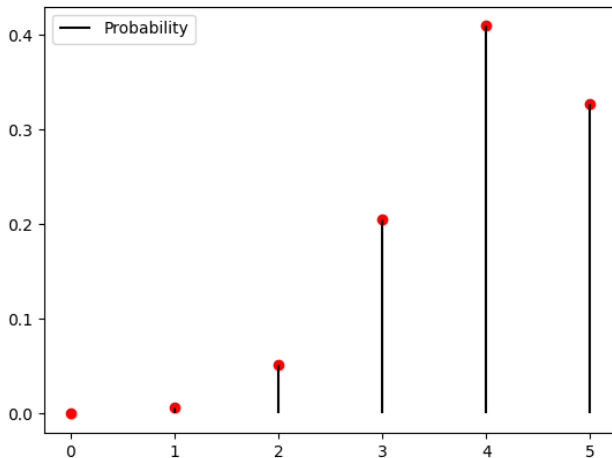


Figure: pmf of this distribution

Solution

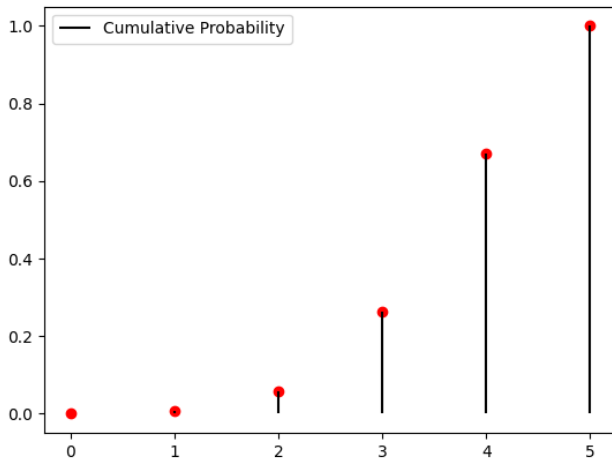


Figure: cdf of this distribution