Assignment -4

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Outline

Abstract

- This document contains the solution to Question of Chapter 6 (Probability) in the NCERT Class 12 Textbook.

In a meeting, 70% of the members favour and 30% oppose a certain proposal. A member is selected at random and we take X=0 if he opposed, and X=1 if he is in favour. Find 1.E(X) and 2.Var(X).

According to the question, X be the random variable where
X=0, if the member oppose a certain proposal
X=1, if the member favours a certain proposal

X	P(X)
0	$\frac{3}{10}$
1	$\frac{7}{10}$

$$E(X) = \sum_{i=1}^{n} x_i P(x_i) \tag{1}$$

$$E(X) = 0 \times \frac{3}{10} + 1 \times \frac{7}{10} \tag{2}$$

$$E(X) = \frac{7}{10} \tag{3}$$

$$Var(X) = E(X^2) - (E(X))^2 \tag{4}$$

$$E(X^2) = \sum_{i=1}^{n} {x_i}^2 P(x_i) \tag{5}$$

$$E(X^2) = 0^2 \times \frac{3}{10} + 1^2 \times \frac{7}{10} \tag{6}$$

$$= \frac{7}{10} \tag{7}$$

$$Var(X) = E(X^2) - (E(X))^2 \tag{8}$$

$$= \frac{7}{10} - \frac{7^2}{10^2} \tag{9}$$

$$= \frac{7}{10} - \frac{49}{100} \tag{10}$$

$$= \frac{21}{100} \tag{11}$$

$$\tag{12}$$