AI1110 ASSIGNMENT-4

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***Abstract*—This document contains the solution for Assignment 4 (NCERT GRADE 10 CHAPTER 15 Example 9)**

EXAMPLE 9 :

Harpreet tosses two different coins simultaneously (say one is ₹1 and other is ₹2). What is the probability that she gets atleast one head ?

Solution :

X is the random variabe that represents the number of heads denoting the outcome of the experiment by $X \in \{1, 2\}$

$$\Pr(X = k) = \begin{cases} \frac{1}{4}, & k = 0 \\ \frac{1}{2}, & k = 1 \\ \frac{1}{4}, & k = 2 \end{cases} \tag{1}$$

for PMF approach :

$$\Pr(X = r) = \binom{n}{r} \times p^r \times (1-p)^r \tag{2}$$

here n = 2 and p = $\frac{1}{2}$, therefore

probalility of getting atleast one head = 1 - probability of getting no heads

$$1 - \Pr(X = 0) \tag{3}$$

$$1 - \binom{2}{0} \times p^0 \times (1-p)^2 \tag{4}$$

$$1 - \frac{1}{2^2} \tag{5}$$

$$= \frac{3}{4} \tag{6}$$

CDF approach:

$$\Pr(X \geq 1) = \Pr(X = 1) + \Pr(X = 2) \tag{7}$$

$$\Pr(X \geq 1) = \frac{3}{4} \tag{8}$$

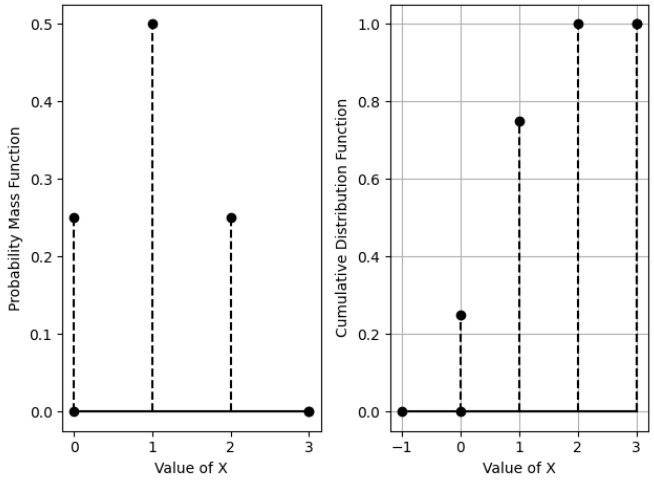

Fig. 0. Plot of the PMF (left) and CDF (right) of an unbiased die. Code: `codes/6_1.py`