Assignment

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Question 11.16.3.10

One of the four persons John, Rita, Aslam or Gurpreet will be promoted next month. Consequently the sample space consists of four elementary outcomes S = John promoted, Rita promoted, Aslam promoted, Gurpreet promoted You are told that the chances of John's promotion is same as that of Gurpreet, Rita's chances of promotion are twice as likely as Johns. Aslam's chances are four times that of John.

1) Determine
   a) P (John promoted)
   b) P (Rita promoted)
   c) P (Aslam promoted)
   d) P (Gurpreet promoted)
2) If A = John promoted or Gurpreet promoted, find P (A).

Solution: Let X be a random variable such that

RV	Value	Description
X	0	Promotion of John
	1	Promotion of Rita
	2	Promotion of Aslam
	3	Promotion of Gurpreet

TABLE I
RANDOM VARIABLE DECLARATION.

Given that,

$$p_X(1) = 2p_X(0) \tag{1}$$

$$p_X(2) = 4p_X(0) \tag{2}$$

$$p_X(3) = p_X(0) \tag{3}$$

Also,

$$\sum_{i=0}^{3} p_X(i) = 1 \tag{4}$$

Hence, we get PMF as follows

1)

$$p_X(k) = \begin{cases} \frac{1}{8} & k = 0 \\ \frac{1}{4} & k = 2 \\ \frac{1}{2} & k = 2 \\ \frac{1}{8} & k = 3 \end{cases} \tag{5}$$

2) $p_X(0) + p_X(3) = \frac{1}{4}$