Assignment

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Question:- Suppose 10000 tickets are sold in a lottery each for Re. 1. First prize is of Rs 3000 and the second prize is of Rs 2000. There are three third prizes of Rs. 500 each. If you buy one ticket, what is your expectation.

Solution: Let X be a random variable such that it denotes winning amount

RV	Value	Description
X	0	Winning no amount
	500	Winning Rs 500
	2000	Winning Rs 2000
	3000	Winning Rs 3000

TABLE I
RANDOM VARIABLE DECLARATION.

$$p_X(k) = \begin{cases} \frac{9995}{10000} & k = 0 \\ \frac{3}{10000} & k = 500 \\ \frac{1}{10000} & k = 2000 \\ \frac{1}{10000} & k = 3000 \end{cases} \tag{1}$$

Expectation is defined as:

$$E(X) = \sum k p_X(k) \tag{2}$$

$$= 0p_X(0) + 500p_X(500) + 2000p_X(2000) + 3000p_X(3000) \tag{3}$$

$$= 0 + \frac{3}{20} + \frac{1}{5} + \frac{3}{10} \tag{4}$$

$$= 0.65 \tag{5}$$